



ASSESSMENT RESOURCES BOOK

PLUMBING III



GREEN
CLIMATE
FUND

MNSDA



Ministry of Environment
Climate Change & Technology

Table of Contents

Unit-1: Apply Occupational Health and Safety requirements.....	12
Unit-2: Apply work ethics and optimize professionalism.....	18
Unit-3: Practice effective workplace communication	29
Unit-4: Provide effective customer care.....	41
Unit-5: Perform computer operations.....	50
Unit-6: Provide first aid	58
Unit-7: Respond to Fire.....	72
Unit-8: Apply Science and Engineering Measurements	81
Unit-9: Perform safe workshop practice	89
Unit-10: Carry out simple concreting and rendering	97
Unit-11: Prepare Estimates and Read layouts	107
Unit-12: Install Domestic water pipe systems	112
Unit-13: Install and fit off sanitary fixtures.....	122
Unit-14: Locate clear blockages and fix leaks	131
Unit-15: Install below ground domestic waste water	140
Unit-16: Fabricate and install roof drainage components	149
Unit-17: Perform plumbing to support rain water harvesting systems	156

Instructions to the Assessor on Competency Based Assessment (CBA)

Assessment is the process of identifying a participant's current knowledge, skills and attitudes sets against all elements of competency within a unit of competency.

Suggested Assessment Methods

For each unit of competency, a number of assessment tools have been identified including:

- ✓ Work Projects
- ✓ Oral Questions
- ✓ Written Questions
- ✓ Third Party Statements
- ✓ Observation Checklists.

Instructions and Evidence Recording Sheets have been identified in this Assessment Manual for use by Assessors.

Alternative Assessment Methods

Whilst the above-mentioned assessment methods are suggested assessment methods, the assessor may use an alternate method of assessment taking into account:

- a. The nature of the unit
- b. The strengths of participants
- c. The number of participants in the class
- d. Time required to complete assessments
- e. Time dedicated to assessment
- f. Equipment and resources required.

Alternate assessment methods include:

- ✓ Practical demonstrations
- ✓ Practical demonstrations in simulated work conditions Problem solving
- ✓ Portfolios of evidence
- ✓ Critical incident reports
- ✓ Journals
- ✓ Oral presentations
- ✓ Interviews
- ✓ Videos
- ✓ Visuals/slides/audio tapes
- ✓ Case studies
- ✓ Log books
- ✓ Projects and Role plays
- ✓ Group projects
- ✓ Recognition of Prior Learning.

Whilst there is no specific instruction or evidence collection documents for all the alternative assessment methods, assessors can record competency in the „Other“ section within the “Competency Recording Sheet”.

Selection of Assessment Methods

Each assessor will determine the combination of Assessment Methods to be used to determine Competency for each Competency Unit on a student by student basis.

“Sufficient“ evidence to support the „Competent“/“Not Yet Competent“ decision must be captured.

In practice this means a minimum of two - three Assessment Methods for each candidate for each Competency Element is suggested.

At least one method should provide evidence of practical demonstration of competence.

The following assessment methods deemed to provide evidence of practical demonstration of competence include:

- ✓ Practical Work Projects
- ✓ Third Party Statement
- ✓ Observation Checklist.

Assessing Competency

Competency based assessment does not award grades, but simply identifies if the participant has the knowledge, skills and attitudes to undertake the required task to the specified standard.

Therefore, when assessing competency, an assessor has two possible results that can be awarded:

- ✓ "Competent" (C)
- ✓ "Not Yet Competent (NYC)

Competent (C)

If the participant is able to successfully answer or demonstrate what is required, to the expected standards of the performance criteria, they will be deemed as "Competent" (C).

The assessor will award a "Competent" (C) if they feel the participant has the necessary knowledge, skills and attitudes in all assessment tasks for a unit.

Not Yet Competent' (NYC)

If the participant is unable to answer or demonstrate competency to the desired standard, they will be deemed to be „Not Yet Competent" (NYC).

This does not mean the participant will need to complete all the assessment tasks again. The focus will be on the specific assessment tasks that were not performed to the expected standards.

The participant may be required to:

- a. Undertake further training or instruction
- b. Undertake the assessment task again until they are deemed to be "Competent".

Trade Testing (Recognition of Prior Learning)

Trade Testing or Recognition of Prior Learning is the process that gives current industry professionals who do not have a formal qualification, the opportunity to benchmark their extensive skills and experience against the standards set out in each unit of competency/subject.

This process is a learning and assessment pathway which encompasses:

- ✓ Recognition of Current Competencies (RCC)
- ✓ Skills auditing
- ✓ Gap analysis and training
- ✓ Credit transfer.

Code of practice for assessors

This Code of Practice provides:

- ✓ Assessors with direction on the standard of practice expected of them
- ✓ Candidates with assurance of the standards of practice expected of assessors
- ✓ Employers with assurance of the standards maintained in the conduct of assessment.

The Code detailed below is based on the available international code of ethics and practice.

- ✓ The differing needs and requirements of the person being assessed, the local enterprise and/or industry are identified and handled with sensitivity
- ✓ Potential forms of conflict of interest in the assessment process and/or outcomes are identified and appropriate referrals are made, if necessary
- ✓ All forms of harassment are avoided throughout the planning, conducting, reviewing and reporting of the assessment outcomes
- ✓ The rights of the candidate are protected during and after the assessment
- ✓ Personal and interpersonal factors that are not relevant to the assessment of competency must not influence the assessment outcomes
- ✓ The candidate is made aware of rights and process of appeal
- ✓ Evidence that is gathered during the assessment is verified for validity, reliability, authenticity, sufficiency and currency
- ✓ Assessment decisions are based on available evidence that can be produced and verified by another assessor
- ✓ Assessments are conducted within the boundaries of the assessment system policies and procedures
- ✓ Formal agreement is obtained from both the candidate and the assessor that the assessment was carried out in accordance with agreed procedures
- ✓ The candidate is informed of all assessment reporting processes prior to the assessment
- ✓ The candidate is informed of all known potential consequences of decisions arising from an assessment, prior to the assessment
- ✓ Confidentiality is maintained regarding assessment results
- ✓ The assessment results are used consistently with the purposes explained to the candidate
- ✓ Opportunities are created for technical assistance in planning, conducting and reviewing assessment procedures and outcomes.

Instructions and checklist for assessors

Instructions

General instructions for the assessment

- ✓ Assessment should be conducted at a scheduled time that has been notified to the candidate
- ✓ Facilitators must ensure participants are made aware of the need to complete assessments and attend assessment sessions
- ✓ If a participant is unable to attend a scheduled session, they must make arrangements with the Assessor to undertake the assessment at an alternative time
- ✓ At the end of the assessment the Assessor must give feedback and advise the participant on their C/NYC status
- ✓ Complete the relevant documentation and submit to the appropriate department.

Preparation

- ✓ Gain familiarity with the Unit of Competency, Elements of Competency and the Performance Criteria expected
- ✓ Study details assessment documentation and requirements
- ✓ Brief candidate regarding all assessment criteria and requirements.

Briefing Checklist

- ✓ Begin the assessment by implementing the following checklist and then invite the candidate to proceed with assessment.

Checklist for Assessors

#	Activity to Follow	Tick	Remarks
Prior to the assessment I have:			
1	Ensured the candidate is informed about the venue and schedule of assessment.		
2	Received current copies of the performance criteria to be assessed, assessment plan, evidence gathering plan, assessment checklist, appeal form and the company's standard operating procedures (SOP).		
3	Reviewed the performance criteria and evidence plan to ensure I clearly understood the instructions and the requirements of the assessment process.		
4	Identified and accommodated any special needs of the candidate.		
5	Checked the set-up and resources for the assessment.		
During the assessment I have:			
6	Introduced myself and confirmed identities of candidates.		
7	Put candidates at ease by being friendly and helpful.		
8	Explained to candidates the purpose, context and benefits of the assessment.		
9	Ensured candidates understood the assessment process and all attendant procedures.		
10	Provided candidates with an overview of performance criteria to be assessed.		
11	Explained the results reporting procedure.		
12	Encouraged candidates to seek clarifications if in doubt.		
13	Asked candidates for feedback on the assessment		
14	Explained legal, safety and ethical issues, if applicable.		
After the assessment I have:			
14	Ensured candidate is given constructive feedback.		
16	Completed and signed the assessment record.		
17	Thanked candidate for participating in the assessment.		

Instructions for recording competency

Specifications for Recording Competency

The following specifications apply to the preparation of Evidence Gathering Plans:

- ✓ A Competency Recording Sheet must be prepared for each candidate to ensure and demonstrate all Performance Criteria and Competency Elements are appropriately assessed. This Sheet indicates how the Assessor will gather evidence during their assessment of each candidate
- ✓ This Competency Recording Sheet is located at the end of the Assessment Plan It is the overriding document to record competency
- ✓ Assessor may vary the Competency Recording Sheet to accommodate practical and individual candidate and/or workplace needs
- ✓ Assessor must place a tick (☑) in the „Assessment Method“ columns to identify the methods of assessment to be used for each candidate
- ✓ Multiple Competency Elements/Performance Criteria may be assessed at the one time, where appropriate

- ✓ The assessor and participant should sign and date the Competency Recording Sheet, when all forms of evidence and assessment have been completed
- ✓ The assessor may provide and feedback or clarify questions which the participant may have in regards to the assessment grade or findings
- ✓ All documents used to capture evidence must be retained, and attached to the Competency Recording Sheet for each candidate for each Competency Unit.

Instructions for different assessment methods

Specifications for Work Project Assessment

These guidelines concern the use of work projects.

The work projects identified in the Training Manuals involve a range of tasks, to be performed at the discretion of the Assessor.

Work project tasks can be completed through any form of assessment as identified in the Trainer and Trainee Manuals and stated at the start of this section.

Assessors should follow these guidelines:

- ✓ Review the Work Projects at the end of each „Element of Competency“ in the Trainee Manual to ensure you understand the content and what is expected
- ✓ Prepare sufficient resources for the completion of work activities including:
 - Time – whether in scheduled delivery hours or suggested time participants to spend outside of class hours
 - Resources – this may involve technical equipment, computer, internet access, stationery and other supplementary materials and documents
- ✓ Prepare assessment location (if done in class) making it conducive to assessment
- ✓ Explain Work Projects assessment to candidate, at the start of each Element of Competency. This ensures that participants are aware of what is expected and can collate information as delivery takes place.
- ✓ Assessors can use the following phrase as a guide (where an „X“ is identified, please input appropriate information):

“At the end of each Element of Competency there are Work Projects which must be completed. These projects require different tasks that must be completed.

These work projects are part of the formal assessment for the unit of competency titled X.

- You are required to complete these activities:
 - Using the ‘X’ method of assessment.
 - At ‘X’ location
 - You will have ‘X time period’ for this assessment.
- You are required to compile information in a format that you feel is appropriate to the assessment.
- Do you have any questions about this assessment?”
- ✓ Commence Work Project assessment:
- ✓ The assessor may give time for participants to review the questions at this time to ensure they understand the nature of the questions. The assessor may need to clarify questions.
- ✓ Participants complete work projects in the most appropriate format

- ✓ Participants must submit Work Project evidence to the assessor before the scheduled due date
- ✓ Assessor must assess the participant's evidence against the competency standards specified in each Element of Competency and their own understanding. The assessor can determine if the participant has provided evidence to a "competent" standard.
- ✓ Transcribe results/details to Competency Recording Sheet
- ✓ Forward/file assessment record.

Specifications for Oral Question Assessment

These guidelines concern the use of oral questioning. Assessors should follow these guidelines.

- ✓ Prepare Assessment Record for Oral Questioning. One record for each candidate:
 - Enter Student name
 - Enter Assessor name
 - Enter Location

- ✓ Familiarize self with Questions to be asked
- ✓ Prepare assessment location (table and chairs) making it conducive to assessment
- ✓ Explain Oral Questioning assessment to candidate, using the following phrase as a guide (where a "X" is identified, please input appropriate information):
 "These oral questions are part of the formal assessment for the unit of competency titled X.
 There are X questions and you are required to answer all of them to the best of your ability and I will record whether or not you have answered correctly.
 - I will give you feedback at the end of the assessment.
 - Do you have any questions about this assessment?"

- ✓ Commence Oral Questioning assessment
- ✓ Complete Assessment Record for the Oral Questioning by:
 - Ticking C or NYC, as appropriate
 - Entering „Remarks" as required
 - Completing Oral Questioning within 60 minutes

- ✓ Complete Oral Questioning and provide feedback to candidate
- ✓ Transcribe results/details to Competency Recording Sheet
- ✓ Forward/file assessment record.

Specifications for Written Question Assessment

These guidelines concern the use of written questioning.

Assessors should follow these guidelines.

- ✓ Familiarize self with Questions and Answers provided.
- ✓ Print and distribute copies of „Written Questions" for participants. Ideally this should take place with adequate time for participants to answer all questions before the expected due date.
- ✓ Explain Written Questioning assessment to candidate, using the following phrase as a guide (where a „X" is identified, please input appropriate information):
 "These written questions are part of the formal assessment for the unit of competency titled X.
 There are X questions and you are required to answer all of them to the best of your ability.

You may refer to your subject materials, however where possible try to utilise your existing knowledge when answering questions.

Where you are unsure of questions, please ask the Assessor for further instruction. This may be answering the question orally or asking the assessor to redefine the question.

We have X time for this assessment.

- The due date for completion of this assessment is X
 - On this date you must forward the completed questions to the assessor by X time on the date of X
 - Do you have any questions about this assessment?"
-
- ✓ The assessor may give time for participants to review the questions at this time to ensure they understand the nature of the questions. The assessor may need to clarify questions. Participants may record written answers (where possible)
 - ✓ Participants must submit the written answers to the assessor before the scheduled due date
 - ✓ Assessor must assess the participant's written answers against the model answers provided as a guide, or their own understanding. The assessor can determine if the participant has answered the questions to a "competent" standard.
 - ✓ Transcribe results/details to Competency Recording Sheet
 - ✓ Forward/file assessment record.

Specifications for Observation Checklist

These specifications apply to the use of the Observation Checklist in determining competency for candidates.

Only an approved assessor is authorized to complete the Observation Checklist.

The assessor is required to observe the participant, ideally in a simulated environment or their practical workplace setting and record their performance (or otherwise) of the competencies listed on the Observation Checklist for the Competency Unit.

To complete the Observation Checklist the Assessor must:

- ✓ Insert name of candidate
- ✓ Insert assessor name
- ✓ Insert identify of location where observations are being undertaken
- ✓ Insert date/s of observations – may be single date or multiple dates
- ✓ Place a tick in either the „Yes" or „No" box for each listed Performance Criteria to indicate the candidate has demonstrated/not demonstrated that skill
- ✓ Provide written (and verbal) feedback to candidate – as/if appropriate Sign and date the form
- ✓ Present form to candidate for them to sign and date
- ✓ Transcribe results/details to Competency Recording Sheet for candidate
- ✓ Forward/file Observation Checklist.

This source of evidence combines with other forms of assessment to assist in determining the "Competent" or "Not Yet Competent" decision for the participant.

Specifications for Third Party Statement

These specifications relate to the use of a relevant workplace person to assist in determining competency for candidates.

The Third-Party Statement is to be supplied by the assessor to a person in the workplace who supervises and/or works closely with the participant.

This may be their Supervisor, the venue manager, the Department Manager or similar.

The Third-Party Statement asks the Supervisor to record what they believe to be the competencies of the participant based on their workplace experience of the participant. This

experience may be gained through observation of their workplace performance, feedback from others, inspection of candidate's work etc.

A meeting must take place between the Assessor and the Third Party to explain and demonstrate the use of the Third-Party Statement.

To complete the Third-Party Verification Statement the Assessor must:

- ✓ Insert candidate name
- ✓ Insert name and contact details of the Third Party
- ✓ Tick the box to indicate the relationship of the Third Party to the candidate
- ✓ Present the partially completed form to the Third Party for them to finalize
- ✓ Collect the completed form from the Third Party
- ✓ Transcribe results/details to Competency Recording Sheet for candidate Forward/file Third Party Statement.

The Third Party must:

1. Record their belief regarding candidate ability/competency as either:
 - Competent = Yes
 - Not Yet Competent = No
 - Unsure about whether candidate is competent or not = Not Sure

2. Meet briefly with the assessor to discuss and/or clarify the form.

This source of evidence combines with other forms of assessment to assist in determining the „Competent“ or “Not Yet Competent“ decision for the candidate.

A separate Third-Party Statement is required for each Competency Unit undertaken by the candidate.

Unit-1: Apply Occupational Health and Safety requirements

Unit No 01
 Unit Title Apply Occupational Health and Safety requirements
 Unit Code CONCM04V1/21

Evidence Matrix

Following matrix is developed using which the Assessment will be planned and undertaken.

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Clean work preparation areas							
Clean preparation areas using appropriate cleaning agents and equipment according to workplace procedures	✓	✓		✓	✓		✓
Remove spillages using appropriate agents, personal protective equipment (PPE) and workplace procedures	✓		✓	✓	✓	✓	
Collect and segregate wastes in accordance with workplace procedures, relevant codes and regulations	✓	✓	✓	✓		✓	✓
2. Clean and store equipment							
Collect used equipment, inspect for faults and, where necessary, remove from service	✓		✓	✓		✓	✓
Use appropriate agents, apparatus and techniques to clean equipment	✓	✓		✓	✓		✓
Store clean equipment in the designated locations and manner	✓	✓	✓		✓	✓	
3. Monitor stocks of materials and equipment							
Perform stock checks and maintain records of usage as directed	✓	✓	✓		✓	✓	✓
Store labelled stocks for safe and efficient retrieval	✓		✓	✓	✓		✓
Inform appropriate personnel of impending stock shortages to maintain continuity of supply	✓	✓		✓	✓	✓	✓
4. Maintain a safe work environment							
Participate in OHS activities within scope of responsibilities	✓	✓	✓	✓	✓	✓	✓
Use established safe work practices and PPE to ensure personal safety and that of other personnel			✓	✓	✓	✓	✓
Report potential hazards and/or maintenance issues in own work area to designated personnel	✓	✓	✓		✓		✓
Minimise the generation of waste and environmental impacts	✓	✓	✓	✓		✓	

Dispose of waste in accordance with workplace procedures, relevant codes and regulations	✓		✓	✓	✓	✓	✓
5. Follow incident and emergency response procedures							
Identify incident and emergency situations	✓		✓	✓	✓		✓
Report and record incident and emergency situations according to workplace procedures	✓	✓		✓	✓	✓	
Follow incident and emergency procedures as appropriate to the nature of emergency using emergency equipment according to workplace procedures	✓		✓		✓		✓
6. Determine Occupational Health and Safety (OH&S) issues relating to immediate work environment							
Occupational Health and Safety issues in the immediate workplace are assessed and action to rectify the problem is taken or reported to supervisor	✓	✓	✓	✓	✓	✓	✓
Understand the aspects of First aid	✓		✓	✓			✓
Understand the aspects of Fire Respond	✓	✓	✓	✓		✓	✓
Workplace and OH&S procedures are followed to ensure safe working environment	✓	✓		✓	✓	✓	
Occupational Health and Safety documents are provided to all work stations, this should include a list of personal safety items based on the line of work	✓	✓	✓		✓	✓	✓

Note:

✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies, FB= Feedback from Fellow Members and RP= Role Play

1. Written questions

#	Questions	Answers
1	Why is it important to keep the work area clean?	A messy workshop hampers productivity, can be extremely hazardous and could cause long term health and safety problems.
2	Name three equipment that are used to clean the workshop area.	<ul style="list-style-type: none"> • Pressure cleaners • Sweepers • Vacuum cleaners
3	What is a polisher used for?	A polisher is used to turn a dirty hard floor to a brand new in a timely fashion
4	How should hazardous waste be stored?	It should be stored under cover and in a bunded and secure area, or in an underground tank.
5	What is stock checking?	Stock checking, is the systematic process of checking the quantity of the inventory.
6	Why is it important to label stocks?	Stock items need to be properly labelled for easy retrieval as confusions may arise if the labels are not properly undertaken.
7	Name 3 key points of ladder safety	<ul style="list-style-type: none"> • the ladder should be checked for safety and for visible signs of damage each time it is used – if in any doubt the ladder should not be used • care must be taken when transporting the ladder around site and when erecting it

		<ul style="list-style-type: none"> the ladder must only be used on firm, level ground
8	What are the categories for hazardous substances?	<ol style="list-style-type: none"> toxic harmful corrosive irritant extremely flammable oxidizing
9	Why is PPE worn?	To minimize exposure to hazards that cause serious workplace injuries and illnesses
10	Name 3 equipment's used for eye protection	<ol style="list-style-type: none"> Safety glasses Safety goggles Welding goggles
11	What is the reporting procedure when an accident occurs in workplace?	If an accident occurs, an employee may be required to complete an accident report form; this should preferably be completed by the injured employee as soon after the accident as possible. If it is completed by a third party, then the employee must carefully check that the details are a clear identification of the events that took place, as once signed, an accident report could be used in legal proceedings
12	What is Workplace health and safety?	Safety of workers (also known as worker safety and occupational health and safety) refers to the provision of a safe working environment, safe equipment, policies, and procedures in order to ensure workers' health and safety.
13	What are the classes of Fire?	<ol style="list-style-type: none"> Class A - fires involving solid materials, extinguished by water Class B – fires involving flammable liquids, extinguished by foam or carbon dioxide Class C – fires involving flammable gases, extinguished by dry powder Class D – fires involving flammable metals, extinguished by dry powder.
14	Name 3 types of fire extinguisher	<ul style="list-style-type: none"> Water Foam Carbon dioxide

2. PT=Practical Test

#	Questions	Answers
1	Follow incident and emergency response procedures	<p>Every student is expected to identify incident and emergency situation presented to them. Identify and analyze the risk, and consider potential consequences in terms of exposure and hazard and likelihood of each</p> <p>The students must be able to follow incident and emergency procedures as appropriate to the nature of emergency using emergency equipment.</p>

2	Demonstrate the basic aspects of First aid	<p>Students must identify the requirements for providing first aid and understands the typical contents of a first aid kit.</p> <p>Students are able distinguish the different treatments for electrical shock, treatments for burns, dealing with broken bones, treatment for foreign bodies in the eye.</p>
3	Demonstrate the basic aspects of Fire Respond	<p>Students understands different classes of fire and firefighting equipment's</p> <p>The students are able to take appropriate actions in the event of a fire.</p> <ul style="list-style-type: none"> • Fire escape routes from the building • The location of designated safe fire assembly points • Raise the fire alarm • Leave by nearest exit • Ensure the emergency service is summoned

3. OW =Observation at work Place

#	Types of Skills	Techniques for validation
1	Scientific terminologies and technical details of sampling, testing, equipment and instrumentation	<ul style="list-style-type: none"> ✓ Accuracy of the information shared ✓ Relevancy of the information ✓ Application of different knowledge to relevant situations
2	Principles of small -scale budgeting, operational planning and efficient resource use	<ul style="list-style-type: none"> ✓ Accuracy of the information shared ✓ Relevancy of the information ✓ Application of different knowledge to relevant situations
3	Career Awareness	<ul style="list-style-type: none"> ✓ From the information shared, validate the presenter is aware of the different career opportunities available across the Water Sanitation sector of the Maldives

4. OQ=Oral Questioning

#	Types of Skills	Techniques for validation
1	Clean work preparation areas	<ul style="list-style-type: none"> ✓ Clean preparation areas using appropriate cleaning agents and equipment according to workplace procedures ✓ Remove spillages using appropriate agents, personal protective equipment (PPE) and workplace procedures ✓ Collect and segregate wastes in accordance with workplace procedures, relevant codes and regulations
2	Clean and store equipment	<ul style="list-style-type: none"> ✓ Collect used equipment, inspect for faults and, where necessary, remove from service ✓ Use appropriate agents, apparatus and techniques to clean equipment ✓ Store clean equipment in the designated locations and manner
3	Monitor stocks of materials and equipment	<ul style="list-style-type: none"> ✓ Perform stock checks and maintain records of usage as directed ✓ Store labelled stocks for safe and efficient retrieval

		<ul style="list-style-type: none"> ✓ Inform appropriate personnel of impending stock shortages to maintain continuity of supply
4	Maintain a safe work environment	<ul style="list-style-type: none"> ✓ Participate in OHS activities within scope of responsibilities ✓ Use established safe work practices and PPE to ensure personal safety and that of other personnel ✓ Report potential hazards and/or maintenance issues in own work area to designated personnel ✓ Minimise the generation of waste and environmental impacts ✓ Dispose of waste in accordance with workplace procedures, relevant codes and regulations
5	Follow incident and emergency response procedures	<ul style="list-style-type: none"> ✓ Identify incident and emergency situations ✓ Report and record incident and emergency situations according to workplace procedures ✓ Follow incident and emergency procedures as appropriate to the nature of emergency using emergency equipment according to workplace procedures
6	Determine Occupational Health and Safety (OH&S) issues relating to immediate work environment	<ul style="list-style-type: none"> ✓ Occupational Health and Safety issues in the immediate workplace are assessed and action to rectify the problem is taken or reported to supervisor ✓ Understand the aspects of First aid ✓ Understand the aspects of Fire Respond ✓ Workplace and OH&S procedures are followed to ensure safe working environment ✓ Occupational Health and Safety documents are provided to all work stations, this should include a list of personal safety items based on the line of work.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Other Sources	Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.

		Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.
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Unit-2: Apply work ethics and optimize professionalism

Unit No	02
Unit Title	Apply work ethics and optimize professionalism
Unit Code	CONCM01V2/20

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Define the purpose of work							
One's unique sense of purpose for working and the whys of work are identified, reflected on and clearly defined for one's development as a person and as a member of society.	✓	✓		✓	✓	✓	
Personal mission is in harmony with company's values.	✓		✓	✓	✓		✓
2. Apply work values/ethics							
Work values/ethics/concepts are identified and classified in accordance with companies' ethical standard guidelines.	✓			✓	✓		✓
Work policies are undertaken in accordance with company's policies, guidelines on work ethical standard.	✓	✓	✓	✓	✓	✓	✓
Resources are used in accordance with company's policies and guidelines.	✓	✓	✓		✓	✓	
Punctuality, absence from work, sick, family and annual leave is maintained alignment to the Employment Act of the Maldives		✓		✓	✓		✓
3. Deal with ethical problems							
Company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct/behavior are followed.	✓	✓	✓	✓		✓	✓
Work incidents/situations are reported according to company protocol/guidelines.	✓	✓	✓	✓	✓	✓	✓
Resolution and/or referral of ethical problems identified are reported/documented based on standard operating procedure	✓		✓	✓	✓		✓
4. Maintain integrity of conduct in the workplace							
Personal behavior and relationships with co-workers and/or clients are demonstrated consistent with ethical standards, policy and guidelines.	✓	✓	✓	✓	✓	✓	✓

Work practices are satisfactorily demonstrated and consistent with industry work ethical standards, organizational policy and guidelines.	✓	✓	✓	✓		✓	
Instructions to co-workers are provided based on ethical lawful and reasonable directives	✓	✓		✓	✓	✓	✓
5. Contribute to workplace efficiency and delivery of quality service							
Prioritize work load according to level of responsibility	✓	✓	✓	✓	✓	✓	✓
Advise supervisor if additional resources or support are required to improve performance	✓	✓		✓	✓		✓
Undertake duties in a positive manner to enhance workplace cooperation and efficiency	✓	✓	✓		✓	✓	
Monitor and adjust work practices to ensure that quality of outputs is maintained	✓	✓	✓	✓		✓	✓
Identify and report opportunities for improvements in procedures, processes and equipment in work area	✓	✓	✓	✓		✓	✓

Note:

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play

1. Written questions

#	Question	Answer
1	Define work ethics and professionalism.	The capacity to demonstrate personal accountability and effective work habits, such as punctuality, working productively with others, and time workload management, and understand the impact of non-verbal communication on professional work image.
2	Identify four work values/ethics	<ol style="list-style-type: none"> 1. Reliability 2. Dedication 3. Discipline 4. Productivity 5. Cooperation 6. Integrity 7. Responsibility 8. Professionalism
3	Briefly explain four work values/ethics.	<p>Reliability Employees with a strong work ethic are very reliable. You can expect these individuals to be on time for shifts and meetings. They meet their deadlines and offer quality work. A reliable coworker makes an excellent teammate because they contribute fairly to projects.</p> <p>Dedication Part of a good work ethic is commitment and dedication to the job. They know how to focus on tasks without being distracted. These employees usually work until they finish their duties. They stay with one company for long periods of time.</p> <p>Discipline Discipline is an essential part of showing a good work ethic. Highly disciplined employees show determination and commitment to the job. They strive to meet or exceed expectations and seek opportunities to learn new skills and improve their performance.</p> <p>Productivity A strong work ethic translates to outstanding productivity. Productive employees often have a higher output than their counterparts. They complete projects early and do more than the minimum requirements.</p> <p>Cooperation A good work ethic is something that employees often spread to those around them by cooperating willingly on projects. They show good teamwork and readily assist others when needed.</p>
4	What are some techniques to improve work values/ethic skills?	<ol style="list-style-type: none"> 1. Act as an ambassador of the company 2. Prioritize your professional responsibilities 3. Seek professional development 4. Review your work 5. Show respect to others
5	Briefly explain some techniques that can be used to improve	<p>Act as an ambassador of the company Maintain a positive attitude toward the company in both professional and personal interactions. Seek ways to further the</p>

	work values/ethic skills.	<p>business even if they're outside the scope of your job. For example, a finance professional may pass a potential lead along to a sales representative.</p> <p>Prioritize your professional responsibilities Maintain good attendance, return promptly from lunch and arrive for meetings early. Strive to make personal appointments that don't interfere with your work schedule and only take personal calls on your cell phone when you're at lunch.</p> <p>Seek professional development Independently seek ways to improve your work performance, such as taking night classes, attending weekend seminars or reading industry publications.</p> <p>Review your work Submit thorough work that you have double-checked for quality and consistency. Manage your time properly so you can deliver projects early and give each task the time and attention it requires.</p> <p>Show respect to others Speak politely to and about others in the workplace. Keep your interactions professional to show your respect for others.</p>
6	Identify five common ethical problems.	<ol style="list-style-type: none"> 1. Unethical leadership 2. Toxic workplace culture 3. Discrimination and harassment 4. Unrealistic and conflicting goals 5. Questionable use of company technology 6. Too frequent coffee or cigarette breaks
7	Briefly explain three common ethical problems.	<p>Unethical leadership Having a personal issue with your boss is one thing, but reporting to a person who is behaving unethically is another. This may come in an obvious form, like manipulating numbers in a report or spending company money on inappropriate activities; however, it can also occur more subtly, in the form of bullying, accepting inappropriate gifts from suppliers, or asking you to skip a standard procedure just once.</p> <p>Toxic workplace culture Organizations helmed by unethical leadership are more often than not plagued by a toxic workplace culture. Leaders who think nothing of taking bribes, manipulating sales figures and data or pressuring employees or business associates for "favors" (whether they be personal or financial), will think nothing of disrespecting and bullying their employees. With the current emphasis in many organizations to hire for "cultural fit," a toxic culture can be exacerbated by continually repopulating the company with like-minded personalities and toxic mentalities.</p> <p>Discrimination and harassment Laws require organizations to be equal employment opportunity employers. Organizations must recruit a diverse workforce, enforce policies and training that support an equal opportunity program, and foster an environment that is respectful of all types of people. Unfortunately, there are still many whose practices</p>

		<p>break with existing guidelines. When discrimination and harassment of employees based on race, ethnicity, gender, disability or age occurs, not only has an ethical line been crossed but a legal one as well.</p> <p>Unrealistic and conflicting goals Your organization sets a goal—it could be a monthly sales figure or product production number—that seems unrealistic, even unattainable. While not unethical in and of itself (after all, having driven leadership with aggressive company goals is crucial to innovation and growth), it’s how employees, and even some leaders, go about reaching the goal that could raise an ethical red flag. Unrealistic objectives can spur leaders to put undue pressure on their employees, and employees may consider cutting corners or breaching ethical or legal guidelines to obtain them. Cutting corners ethically is a shortcut that rarely pays off, and if your entire team or department is failing to meet goals, company leadership needs that feedback to revisit those goals and re-evaluate performance expectations.</p>
8	<p>Briefly explain three methods on dealing with ethical issues at workplaces.</p>	<p>Gather as much information as possible Before taking action to solve an ethical issue, we need to have thorough understanding of that issue as possible. The problem may not be as straightforward as it first appears and it is important to gather enough information to determine what’s going on. Gather all relevant facts concerning the issue at hand, and ensure we are not making assumptions. Everyone has their own personal and professional biases. Some of those biases are grounded in experience, but with limited facts or information, it could be skewed to perspectives and be lacking reality.</p> <p>Identify the parties involved Identify the parties involved and determine who else is involved in this issue. Involvement can be direct or indirect and on a direct level, those participating in the ethical violation are certainly involved. On an indirect level, those who will be impacted regardless of having no say in the issue are also involved. Among others, this can include coworkers, customers, and stockholders. It is important to determine who, among those involved. While fixing the issue, ensure the case is within your scope of duty and if not refer to the relevant seniors within the organization.</p> <p>Pinpoint the ethical issues involved Instead of settling for a general sense that something is wrong, you need to ask yourself which ethical principles are being abused. Some ethical violations are more obvious than others. For instance, if you caught a coworker stealing expensive equipment, you could make the clear distinction that theft is wrong. In situations dealing with small violations or interdepartmental strife, though, the violation may not be as clear. Review the circumstances again and ask yourself which fundamental principle is affected. Possible options include violations of power, integrity, honesty, objectivity, professional competence, confidentiality, or fairness.</p>

		<p>Review the company's standard procedure Find out if your company currently has an internal system set up for dealing with ethical issues like this. If you have a company manual or similar documentation, review it now. Look into the organization's policies concerning workplace ethics. Pay close attention to the chain of command. Find out who you should involve at which points, and the correct procedure for doing so. If the company doesn't have a set structure for dealing with ethical issues, you will need to determine who to go to using your own experience and understanding.</p> <p>List and evaluate your options Think of every possible option available to you instead of settling for the most obvious. Write out each of these options and consider the impact each one might have. When evaluating your options, consider how each one fares in the light of your company's internal procedures, any external laws involved, and any general ethical values upheld by society as a whole. Predict the consequences that will result from each option. This includes both positive and negative outcomes. Understand that, in some circumstances, each option may come with both negative and positive consequences. Etc.</p>
9	Define professional integrity	Professional integrity is the practice of maintaining appropriate ethical behavior. It is the practice of showing strong adherence to moral and ethical principles and values such as honesty, honor, dependability and trustworthiness.
10	Identify three reasons for maintaining professional integrity.	<ul style="list-style-type: none"> ✓ Employee satisfaction ✓ Reputation ✓ Clearer focus ✓ Stronger sales
11	Briefly explain three reasons for maintaining professional integrity	<p>Employee satisfaction: Employees are typically happier working for someone who they believe is trustworthy and dependable, someone who would never ask them to compromise their own principles. Integrity in a supervisor has been linked to job satisfaction and engagement, employee health and even life satisfaction.</p> <p>Reputation: In order for people to trust you—both in- and outside of your organization—you need to behave with integrity. Investors need to trust you in order to consider investing in your business. Vendors need to trust that you will pay for goods and services. Maintaining professional integrity will allow you to build a strong reputation that will increase the trust and comfort others have in doing business with you</p> <p>Clearer focus: Consistently behaving with professional integrity means you have the energy to focus on what is important rather than wasting energy covering up bad practice.</p>

		<p>Stronger sales: Customers today are motivated to buy from companies that are socially and environmentally responsible. The most effective way to create a culture of integrity and ethical behavior is to behave with professional integrity.</p>
12	Identify the skills that should be developed when maintaining integrity in the workplace.	<ol style="list-style-type: none"> 1. Treat everyone the same 2. Reward honesty 3. Admit your mistakes 4. Encourage teams to speak freely 5. Conduct self-assessments 6. Keep your commitments 7. Put in maximum effort
13	Briefly explain four skills that should be developed when maintaining integrity in the workplace.	<p>1. Treat everyone the same Integrity is about honesty, wholeness and being the same person in all situations and with all people. Treat supervisors, coworkers and even the intern with the same level of professionalism and respect, regardless of their level of seniority. The same applies to customers. Every customer should be given the best treatment, regardless of the level of service they pay for.</p> <p>2. Reward honesty Create a culture of integrity by encouraging others to be honest with you, even when they make costly mistakes. Reward honesty publicly and repeatedly until everyone on your team understands that it's always safe—and always the best idea—to be honest with you.</p> <p>3. Admit your mistakes Everyone makes mistakes and no one, from customers to employees, expects everyone to be perfect all the time. The key to behaving with professional integrity is admitting mistakes and apologizing when you're wrong. You must also demonstrate your regret through your actions and demeanor. You'll generally find that not only do people not think less of you, they actually think more highly of you by your ability to admit error.</p> <p>4. Encourage teams to speak freely Encourage your team to come up with fresh and creative approaches to everyday business challenges you encounter. Team discussions regarding new ideas should be honest and critical, yet respectful and open-minded of other perspectives. Encourage your team to speak freely as well as give and receive constructive criticism to improve ideas.</p> <p>5. Conduct self-assessments Periodically evaluate whether you are behaving with professional integrity. Evaluate whether you are heavily influenced by stronger personalities, pressured by your boss or tempted by easy money. You could even ask a trusted coworker their objective viewpoint. Make a non-judgmental inventory of your own integrity and determine whether you need to take action based on potential areas of self-improvement. Etc.</p>

14	What are the three components of excellent service quality	<ol style="list-style-type: none"> 1. Great Service climate 2. Service strategy 3. Service Performance
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1. PT=Practical Test

#	Activity	Assessment scope
1	Presentation on "Importance of Work and Plans for Career Development"	<p>Asses the presentation on the following.</p> <ul style="list-style-type: none"> ✓ Reason for work is explained ✓ Proper knowledge of the career expressed ✓ Plans for self-development and pathways for career advancement is explained
2	Role Play on application of work values/ethic	<p>Asses the role play and observe the following</p> <ul style="list-style-type: none"> ✓ Participant understands the concepts related to work values and ethics ✓ Reviewed roles of different occupations within company and explain good practices related to performing work ✓ Revisit the existing company policies and interpreted meaning of these policies including Do's and Do Nots of these policies ✓ Interpret good employee attributes related to handling of punctuality, absence from work, sick, family and annual leave
3	Assignment focused on managing an ethical problem within the workplace with steps to manage the problem with application of integrity.	Students will be given assignment where they will be asked to identify and select an ongoing ethical problem, analyse it and detail the steps to manage the problem with applications of honesty and integrity within the workplaces.

2. OW =Observation at work Place

#	Observation activity	Points to validate
1	Presentation on "Importance of Work and PlansforCareer Development"	<p>Use the presentation and assess the following</p> <ul style="list-style-type: none"> ✓ Purpose for working and the why's of work are identified, reflected and linked to self-development
2	Role Play on application of work values/ethic	<p>Observe the role play and validate if the students are aware of the following</p> <ul style="list-style-type: none"> ✓ Work policies are undertaken in accordance with company's policies. ✓ Resources are used in accordance with company's policies and guidelines.

3	<p>Assignment focused on managing an ethical problem within the workplace with steps to manage the problem with application of integrity.</p>	<p>Check the assignment and observe the following</p> <ul style="list-style-type: none"> ✓ Work incidents/situations are identified and reported according to company guidelines ✓ Personal behavior and relationships with co-workers and clients are within ethical standard ✓ Work practices are maintained within ethical boundaries for sustained integrity at workplace.
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3. OQ=Oral Questioning

#	Questions	Validating Student Performance
1	Define the purpose of work	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ One's unique sense of purpose for working and the whys of work are identified, reflected on and clearly defined for one's development as a person and as a member of society. ✓ Personal mission is in harmony with company's values.
2	Apply work values/ethics	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work values/ethics/concepts are identified and classified in accordance with companies' ethical standard guidelines. ✓ Work policies are undertaken in accordance with company's policies, guidelines on work ethical standard. ✓ Resources are used in accordance with company's policies and guidelines. ✓ Punctuality, absence from work, sick, family and annual leave is maintained alignment to the Employment Act of the Maldives
3	Deal with ethical problems	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct/behavior are followed. ✓ Work incidents/situations are reported according to company protocol/guidelines. ✓ Resolution and/or referral of ethical problems identified are reported/documentated based on standard operating procedure
4	Maintain integrity of conduct in the workplace	<p>Make sure the students answer questions related to the following areas</p>

		<ul style="list-style-type: none"> ✓ Personal behavior and relationships with coworkers and/or clients are demonstrated consistent with ethical standards, policy and guidelines ✓ Work practices are satisfactorily demonstrated and consistent with industry work ethical standards, organizational policy and guidelines. ✓ Instructions to co-workers are provided based on ethical lawful and reasonable directives
5	Contribute to workplace efficiency and delivery of quality service	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Prioritize work load according to level of responsibility ✓ Advise supervisor if additional resources or 15 support are required to improve performance ✓ Undertake duties in a positive manner to enhance workplace cooperation and efficiency ✓ Monitor and adjust work practices to ensure that quality of outputs is maintained ✓ Identify and report opportunities for improvements in procedures, processes and equipment in work area

4. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.

		Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.
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Unit-3: Practice effective workplace communication

Unit No	03
Unit Title	Practice effective workplace communication
Unit Code	TOUCM04V2/20

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Communicate with customers and colleagues							
Proper channels and methods of communication used	✓	✓	✓	✓		✓	✓
Workplace interactions with customers and colleagues appropriately made	✓	✓	✓		✓	✓	✓
Appropriate non-verbal communication used	✓	✓		✓	✓	✓	
Appropriate lines of communication followed	✓	✓	✓	✓	✓		✓
2. Speak English and Dhivehi at an operational level							
Workplace interactions with colleagues appropriately made	✓	✓	✓	✓		✓	✓
Verbal instructions or requests are responded to at an operational level	✓	✓	✓		✓	✓	✓
Appropriate non-verbal communication used	✓	✓		✓	✓	✓	
Simple requests are made	✓	✓	✓	✓		✓	✓
Routine procedures are described	✓	✓	✓		✓	✓	✓
Different forms of expression in English and Dhivehi is identified and used as appropriate	✓	✓		✓	✓	✓	
3.Participate in workplace meetings and discussions							
Meetings and discussions attended on time	✓	✓	✓	✓		✓	✓
Procedures to expressing opinions and following instructions clearly followed	✓	✓	✓		✓	✓	✓
Questions asked and responded to effectively	✓	✓		✓	✓	✓	
Meeting and discussion outcomes interpreted and implemented correctly	✓	✓	✓	✓		✓	✓
4.Handle relevant work-related documentation							
Conditions of employment are clear and understood properly	✓	✓	✓	✓		✓	✓
Relevant information accessed from appropriate sources	✓	✓	✓		✓	✓	✓
Relevant data on workplace forms and other documents filled correctly	✓	✓		✓	✓	✓	

Instructions and guidelines understood and followed properly	✓	✓	✓	✓		✓	✓
Reporting requirements completed properly		✓	✓		✓		
5.Manage workplace calls and messages							
Operate workplace phones	✓	✓	✓	✓		✓	✓
Attend and manage phone calls	✓	✓	✓		✓	✓	✓
Read and respond to texts and messages	✓	✓		✓	✓	✓	
Perform communication in both English and Dhivehi	✓	✓	✓	✓		✓	✓

Note:

- ✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play

1. Written questions

	Question	Answer
1	Define communication.	Communication is the process of transmitting information and common understanding from one person to another.
2	Define communication channels.	Communication channels are the means through which people in an organization communicate and interact with each other.
3	Identify the types of communication channels.	<ol style="list-style-type: none"> 1. Communication channels by formality 2. Communication channels by means of communication
4	What are the three different communication channels based on formality?	<ol style="list-style-type: none"> 1. Formal communication channels 2. Information communication channels 3. Unofficial communication channels
5	Briefly explain the three different communication channels based on formality.	<p>1. Formal communication channels Formal communication includes exchange of information such as the goals, policies and procedures of an organization. Some of the most common examples of formal communication include company business plans, strategy, goals, annual reports, agreements, company-wide communications, workplace safety guidelines and procedures, board presentations etc.</p> <p>2. Information communication channels Informal communication channels are also used to deliver official business messages but in a more relaxed way. Some examples of informal communication include conversations at work addressing various issues that team members may have, lunch time conversations and continuous collaboration among team members.</p> <p>3. Unofficial communication channels In addition to official communication channels, there is also an unofficial mode of communication that is quite common in the workplace. Unofficial communication includes employee communication outside of work environment on topics not related to work.</p>
6	What does it mean to divide communication channels by mean?	Dividing channels by the way and tools employees use to communicate with each other.
7	What are the three types of main means of communication in the workplace?	<ol style="list-style-type: none"> 1. Digital communication channels 2. Face-to-face communication 3. Written communication
8	Briefly explain the three types of main means of communication in the workplace.	<p>1. Digital communication channels Electronic means of communication include various online tools that employees use to stay connected with each other and keep up with the company news and updates. Today, digital communication channels are the most popular and most used channels in the workplace. Some of the examples include email, internal communication platforms, employee collaboration software and intranets.</p>

		<p>2. Face-to-face communication</p> <p>Even though electronic means of conversation in the workplace are taking over, face-to-face communication is still extremely important. This mean is much more personal, and it has more human touch into it.</p> <p>3. Written communication</p> <p>This type of communication is almost completely dead within organizations. However, written communication is still necessary when important policies, letters, memos, manuals, notices and announcements are being communicated to the employees.</p>
9	Identify some basic rules of building social relationships.	<ul style="list-style-type: none"> • Identify the presence of your classmates • Work with the conversation • Share a bit of yourself • Empathy • Active listening
10	Briefly explain some basic rules of building social relationships.	<ul style="list-style-type: none"> • Identify the presence of your classmates <p>We mean to greet or recognize the other person who is close to you. A smile or a look is enough to show that you have seen that person, basically nothing but good education.</p> <ul style="list-style-type: none"> • Work with the conversation <p>Starting the conversation yourself by telling your own experiences or asking the other person about your life is a good way to improve social relationships. In this way you will demonstrate your inclination to know that person more. By finding something that interests you or that you have in common, you will be creating the basis for future interactions. Do not forget to observe the details and focus on them, but always avoiding judging.</p> <ul style="list-style-type: none"> • Share a bit of yourself <p>A conversation is not only based on asking and listening, it is an interaction between two people, in which both can and should contribute their views. In this way, we must try not to fall into an “interrogation” and reveal our own feelings and opinions at the same time, since this will allow us to see our own perspective and create a true connection.</p> <ul style="list-style-type: none"> • Empathy <p>It is the basic quality to develop when interacting with other people and that can be demonstrated in different ways. We refer to the ability to put ourselves in the place of the other person, and show a real interest in connecting with them. This desire is also demonstrated through our body gestures and facial expressions; such as smiling or bowing are examples of nonverbal language that convey an idea of attention for what the other person expresses.</p> <p>Etc.</p>
11	Briefly describe five ways of nonverbal communication used in the workplace.	<ul style="list-style-type: none"> • Supports your message. <p>When having a conversation, participating in a meeting or engaging in conversation, nonverbal cues can emphasize and underscore the content of your message. For example, using</p>

		<p>hand gestures to indicate the importance of an idea may tell your listeners to pay attention to and remember a key point.</p> <ul style="list-style-type: none"> • Communicates messages. <p>You may also use nonverbal communication completely to communicate with others. For example, if someone is explaining a sentiment you admire and agree with, you might nod your head up and down to express solidarity.</p> <ul style="list-style-type: none"> • Communicates intention. <p>Your body language may also intentionally or unintentionally express your current condition. For example, people may pick up nonverbal cues that you are being dishonest, unengaged, excited or aggressive.</p> <ul style="list-style-type: none"> • Conveys feelings. <p>You can also use nonverbal communication to show your feelings, such as disappointment, relief, happiness, contentment and more.</p> <ul style="list-style-type: none"> • Offers support. <p>Nonverbal cues are also a great way to show support. Whether it's a simple smile or pat on the back, action may speak louder than words in many cases. Etc.</p>
12	Briefly describe three tips to keep in mind when making a simple request.	<ul style="list-style-type: none"> • Don't demand <p>People always resent being ordered around so make sure to avoid using imperatives when making requests. Saying, "Give me some time off" will never please your boss. Instead, start your request politely, for example, "I'd like to request some annual leave" or "I'd appreciate it if you could give me your feedback".</p> <ul style="list-style-type: none"> • Eliminate "I need" <p>Always talking about what you "need" can make you sound bossy and offensive because it shows that you think your needs are more important than other people's. Use questions like "Could you please...?" and "Would you be able to...?" to sound more considerate and polite.</p> <ul style="list-style-type: none"> • Avoid assumption <p>Even if you have an understanding boss, it's best not to make assumptions about being allowed to do certain things. If you want to leave early, it's much better to say "Would it be OK if I slipped out a bit early today?" than "I'm going to leave a bit early today". Think of the consequences of your request and what you will do to make up for any inconvenience caused. For example, if you need to leave a little early, explain when you will make up for the work you've missed.</p> <ul style="list-style-type: none"> • Steer clear of accusations <p>If your manager seems to have forgotten about your request, don't accuse him or her of not doing the work by saying, "Where are those figures I asked for?" For a simple yet effective reminder, just say, for example, "I was wondering if you've had the chance to calculate those figures." It's a non-threatening way to remind your boss of something he or she promised to do.</p>

13	Identify and briefly explain the pre-requisites for a successful meeting,	<p>1. A clearly defined purpose for the meeting Ask questions such as; Why are we meeting? What are we trying to achieve? Are we meeting for meetings sake? However, consider that at times the purpose of bringing people together for a meeting may be to achieve other important interpersonal objectives like team building, brain storming or group problem solving. Make sure that you clearly communicate the meeting purpose well before hand, this gives attendees time to gather ideas or research issues prior to attending the meeting.</p> <p>2. Advise people of the meeting in time for them to be able to attend It is amazing how often key people are left out of meetings or are not able to attend simply due to a lack of planning and sufficient notice.</p> <p>3. Set an agenda An agenda aims to keep discussions on track and to keep everyone focussed on the issues. The agenda should be distributed to attendees before the meeting.</p> <p>4. Start and finish on time Make sure the meeting starts and finishes on time so participants feel that their time is valued and that they can plan for effective meeting participation to fit within their work load.</p> <p>5. Manage the participants It is important that every person feels their attendance and contribution is valued. People must be given the opportunity to express their opinion as well as recognising they must also listen to others without interruption. Clear conflict management strategies must be in place.</p>
14	Identify five common workplace documents.	<ol style="list-style-type: none"> 1. Registration and Permit Certificates 2. Lease Contracts 3. Employment Contracts, Appraisal reports 4. Warranty and Insurance Certificates 5. Memorandum of Understanding (MOUs) 6. Memos, Policies, Letters, Meeting Minutes 7. Financial Records 8. Inventory Records
15	Briefly explain five common workplace documents.	<p>1. Registration and Permit Certificates Whether it's a company or Sole Proprietorship, relevant registration certificates need to be carefully stored and kept as referred registration certificates may need to be produced for different purposes.</p> <p>2. Lease Contracts Companies big or small may have several lease contracts involving lease of the office space, equipment or land. Such lease contracts need to be properly managed and stored to ensure lease terms and other contractual terms are properly managed and implemented.</p> <p>3. Employment Contracts, Appraisal reports This contract sets and the appraisal reports need to be stored in order to minimize future disputes. Not every hire requires an employment agreement, but the document can be a useful if</p>

		<p>you want to dissuade certain new hires from leaving your company too soon, disclosing confidential information about your business, or going to work at a competitor. The contract should be reviewed by an experienced employment expert before given to an employee to sign.</p> <p>4. Warranty and Insurance Certificates</p> <p>Companies often procure expensive items that becomes part of their operational expenses and hence such equipment or tools may play a crucial role in the survival or growth of the enterprises. For this purpose, it is important that the Warranty or Insurance Certificates be kept safe and accessible to ensure business operations remain smooth and healthy always.</p> <p>5. Memorandum of Understanding (MOUs)</p> <p>An MOU falls somewhere between a formal contract and a handshake. It documents any important conversations you have with suppliers, potential partners and others involved in the business. MOUs are great ways to lay out the terms of a project or relationship in writing, but do not rely on the document to be legally binding Etc.</p>
16	Identify three methods of managing workplace documents.	<ol style="list-style-type: none"> 1. Re-organize your workspace 2. Get filing 3. Label clearly 4. Sort out loose documents 5. Use storage boxes 6. Use a digital filing system
17	Briefly explain three methods of managing workplace documents.	<p>1. Re-organize your workspace</p> <p>Take the time to go through your existing files and documents, and sort out which documents are important enough to be kept on file, and which ones need to be shredded. Any duplicates can be thrown away, and anything you haven't used in the last 6 months can be put into recycling. Be sure to clear out any drawers and filing cabinets so you can start from scratch and organize a system that works for everyone</p> <p>2. Get filing</p> <p>There's good reason why filing cabinets are one of the most common forms of storage for documents, in the home and in the office. Broad headings will help to decrease filing time. However, you might want to consider adding subheadings to the more generalized folders to prevent cluttering and allow for easy finds</p> <p>3. Label clearly</p> <p>This is vital to keeping your filing system organized and free of accidental category mixing. Document folders can be labelled in order of topic and purpose. Dates are also good to include within the subcategories. Alphabetically ordering files is another popular way of organizing documents. While organizing things alphabetically is a good idea, many organizers recommend keeping an index of all the document folder names, allowing you to keep track of added categories.</p> <p>4. Sort out loose documents</p>

		Some offices have baskets for documents that need to be filed or shredded. In order to keep on top of everything, it's best to get onto these documents as soon as you can to avoid piling up. Make sure you go through your 'to-file' basket carefully and filter out any documents you won't need in the immediate future, as well as duplicates. Etc.
18	What is bookkeeping?	Bookkeeping is the process of recording company's financial transactions into organized accounts on a daily basis.
19	Why is bookkeeping considered an essential part of accounting process?	When you keep transaction records updated, it can generate accurate financial reports that help measure business performance. Detailed records will also be handy in the event of a tax audit.
20	Identify three methods of bookkeeping.	<ol style="list-style-type: none"> 1. Single-entry bookkeeping 2. Double-entry bookkeeping 3. Cash-based or accrual-based
21	Briefly explain three methods of bookkeeping.	<p>1. Single-entry bookkeeping Single-entry bookkeeping is a straightforward method where one entry is made for each transaction in your books. These transactions are usually maintained in a cash book to track incoming revenue and outgoing expenses. You do not need formal accounting training for the single-entry system. The single-entry method will suit small private companies and sole proprietorships.</p> <p>2. Double-entry bookkeeping Double-entry bookkeeping is more robust. It follows the principle that every transaction affects at least two accounts, and they are recorded as debits and credits. For example, if you make a sale for \$10, your cash account will be debited for \$10 and your sales account will be credited by the same amount. In the double-entry system, the total credits must always equal the total debits. When this happens, your books are "balanced."</p> <p>3. Cash-based or accrual-based The next step is choosing between a cash or accrual basis for your bookkeeping. This decision will depend on when your business recognizes its revenue and expenses. In cashbased, you recognize revenue when you receive cash into your business. Expenses are recognized when they are paid for. In other words, any time cash enters or exits your accounts, they are recognized in the books. In the accrual method, revenue is recognized when it is earned. Similarly, expenses are recorded when they are incurred, usually along with corresponding revenues. The actual cash does not have to enter or exit for the transaction to be recorded.</p>
22	Identify four methods of recording transactions.	<ol style="list-style-type: none"> 1. Cash registers 2. The journal 3. The ledger 4. Trial balance
23	Briefly explain four methods of recording transactions.	<p>1. Cash registers A cash register is an electronic machine that is used to calculate and register transactions. Usually, cash registers are used to record cash flow in stores. The cashier collects the cash for a</p>

sale and returns a balance amount to the customer. Both the collected cash and balance returned are recorded in the register as single-entry cash accounts. Cash registers also store transaction receipts, so you can easily record them in your sales journal. Cash registers are commonly found in businesses of all sizes. However, they aren't usually the primary method of recording transactions because they use the single-entry, cash-based system of bookkeeping. This makes them convenient for very small businesses but too simplistic for enterprises.

2. The journal

The journal is called the book of original entry. It is the place where a business chronologically records its transactions for the first time. A journal can be either physical (in the form of a book or diary), or digital (stored as spreadsheets, or data in accounting software). It specifies the date of each transaction, the accounts credited or debited, and the amount involved. While the journal is not usually checked for balance at the end of the fiscal year, each journal entry affects the ledger. As we'll learn, it is imperative that the ledger is balanced, so keeping an accurate journal is a good habit to keep. This form is useful for double-entry bookkeeping.

3. The ledger

A ledger is a book or a compilation of accounts. It is also called the book of second entry. After you enter transactions in a journal, they are classified into separate accounts and then transferred into the ledger. These records are transcribed by accounts in the order: assets, liabilities, equity, income, and expenses. Like the journal, the ledger can also be physical or electronic spreadsheets.

A ledger contains a chart of accounts, which is a list of all the names and number of accounts in the ledger. The chart usually occurs in the same order of accounts as the transcribed records.

Unlike the journal, ledgers are investigated by auditors, so they must always be balanced at the end of the fiscal year. If the total debits are more than the total credits, it's called a debit balance. If the total credits outweigh the total debits, there is a credit balance. The ledger is important in double-entry bookkeeping where each transaction changes at least two sub-ledger accounts.

4. Trial balance

The trial balance is produced from the compiled and summarized ledger entries. The trial balance is like a test to see if your books are balanced. It lists the accounts exactly in the following order: assets, liabilities, equity, income, and expenses with the ending account balance.

An accountant usually generates the trial balance to see where your business stands and how well your books are balanced. This can then be cross-checked against ledgers and journals. Imbalances between debits and credits are easy to spot on the trial balance. It is not always error-free, though. Any miscalculated or wrongly-transcribed journal entry in the

		ledger can cause an incorrect trial balance. It is best to look out for errors early, and correct them on the ledger instead of waiting for the trial balance at the end of the fiscal year.
24	What are the three major financial reports that every business must know?	<ol style="list-style-type: none"> 1. The cash flow statement 2. The balance sheet 3. The income statement
25	Define bank reconciliation.	Bank reconciliation is the process of finding congruence between the transactions in your bank account and the transactions in your bookkeeping records.
26	What are the consequences of failing to answer the telephone promptly and correctly?	<ul style="list-style-type: none"> • Loss of revenue • Loss of jobs • Poor or negative customer relations • Customers who are more difficult to deal with • Reduced business image in the eyes of the customer
27	Identify four examples of appropriate telephone manner.	<ul style="list-style-type: none"> • Using polite language at all times • Using appropriate welcoming or greeting phrases • Showing enthusiasm when taking a call • Being friendly • Making an offer of help to the caller
28	What are five things you should keep in mind when recording and passing on messages?	<ul style="list-style-type: none"> • Taking messages cheerfully • Using the designated telephone message form • Making sure you capture all the information the caller gives you • Ensuring you get the details correct • Repeating the message back to the caller to confirm it • Thanking the caller
29	Identify three reasons why internal electronic systems are beneficial when taking telephone messages.	<ul style="list-style-type: none"> • Facilitates recording of message • Saves time • Makes distribution of message easier

2. PT=Practical Test

#	Practical Activity	Validating Techniques
1	List workplace functions and relevant documentations needed to complete workplace tasks.	While answering, make sure they correctly list the workplace functions, documentations needed and also explain where they can access these documentations. They also should explain their role in filling these documentations and where to get the relevant forms and also where to submit after filling them.
2	Ask students to write small paragraphs using both English and Dhivehi. Also examine their speaking competencies.	Check student test papers, assignments and validate if they have the competency to write in Dhivehi and English. Also check if they can speak in both Dhivehi and English.

3	Students participate in workplace meetings and discussions	Check if students have attended meetings and participated in workplace discussions. This can be validated by review role play exercises or meeting minutes that can be obtained at the time of assessment.
4	Complete work documents	Check if students have undertaken workplace documentations such as issuing receipts or filling up of forms such as leave forms etc. There can be different documentations that can be witnessed to ensure student competently attend workplace documentations.
5	Manage workplace calls and messages	Often calls and messages are linked to the work being performed across the workplaces. It is vital that student competency in making calls and messages be reviewed and validated through role plays or through recordings of previous messages and calls.

3. OW = Observation at work Place

#	Activities to be observed	Criteria to validate competency
1	Review all papers, assignments, log books and other relevant documents	Past papers, assignments, log books and other relevant documents can be reviewed to assess and evaluate the following competencies. <ul style="list-style-type: none"> ✓ Convey workplace information ✓ Speak English and Dhivehi at an operational level ✓ Complete relevant work-related documents ✓ Manage workplace calls and messages
2	Review the minutes of workplace meetings and discussions	By observing minutes of the meetings will illustrate how individual students have participated in the workplace meetings and discussions. Check for the ideas expressed by the individual students to assess and evaluate their performance.
3	Review already compiled workplace documentations	Every workplace has different sets of workplace documentations and by reviewing these documentations will help the assessor to assess and evaluate performance of individual students.
4	Review call and message logs	Review of the calls and messages log sheets will put light into the way how calls and messages are attended and managed by the students and can provide important evidence on the performance of the students within this respect area.

4. OQ=Oral Questioning

#	Oral questioning activities	Answers
1	Convey workplace information	Students can be asked to provide information related to different information sources and their respective locations within the workplaces. Answers from the students will help the assessor to evaluate competencies of the students in conveying workplace information.
2	Speak English and Dhivehi at an operational level	Assessor can verbally ask questions and on site ask them to write both Dhivehi and English. Their responses can be used

		to assess and evaluate their performance in the respective competency.
3	Complete relevant work-related documents	Student filled workplace documentations can be reviewed and oral questions can be asked to assess and make judgments on the competencies of the students.
4	Manage workplace calls and messages	Workplace calls and message log can be viewed and different oral questions can be asked to assess and evaluate performance of the students.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-4: Provide effective customer care

Unit No 04
 Unit Title Provide effective customer care
 Unit Code TOUCM05V2/20

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Greet customers and colleagues							
Customers and colleagues greeted according to standard procedures and social norms	✓	✓		✓	✓	✓	✓
Sensitivity to cultural and social differences demonstrated	✓	✓	✓		✓		✓
2. Identify and attend to customer needs							
Appropriate interpersonal skills are used to ensure that customer needs are accurately identified	✓	✓		✓	✓	✓	✓
Customer needs are assessed for urgency so that priority for service delivery can be identified	✓	✓	✓		✓		✓
Personal limitation in addressing customer needs is identified and where appropriate, assistance is sought from supervisor	✓	✓		✓	✓	✓	✓
Customers informed correctly	✓	✓	✓		✓		✓
Personal limitation identified and assistance from proper sources sought when required	✓	✓		✓	✓	✓	✓
3. Deliver service to customers							
Customer needs are promptly attended to in line with organizational procedure	✓	✓		✓	✓	✓	✓
Appropriate rapport is maintained with customer to enable high quality service delivery	✓	✓	✓		✓		✓
Opportunity to enhance the quality of service and products are taken wherever possible	✓	✓		✓	✓	✓	✓
4. Handle inquiries							
Customer queries handled promptly and properly	✓	✓		✓	✓	✓	✓
Personal limitations identified and assistance from proper sources sought when required	✓	✓	✓		✓		✓
5. Handle complaints							

Responsibility for handling complaints taken within limit of responsibility	✓	✓		✓	✓	✓	✓
Personal limitations identified and assistance from proper sources sought when required	✓	✓	✓		✓		✓
Operational procedures to handling irate or difficult customers followed correctly	✓	✓		✓	✓	✓	✓
Details of complaints and comments from customers properly recorded	✓	✓	✓		✓		✓
6. Handle and manage angry customers							
Apply principles related to anger management	✓	✓		✓	✓	✓	✓
Meet with angry customers and console them accordingly	✓	✓	✓		✓		✓
Maintain a log book for recording customer service incidents	✓	✓		✓	✓	✓	✓

Note:

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play

1. Written questions

#	Question	Answer
1	What are the importance of a good customer service?	<ul style="list-style-type: none"> • Increase customer loyalty • Increase the amount of money each customer spends with your business • Increase how often a customer buy from you • Generate positive word-of-mouth about your business
2	What are the 3 effective greeting rules?	<ol style="list-style-type: none"> 1. Good Eye Contact 2. Great Smile 3. Great Opener
3	In a possible scenario; when a customer is approaching at your work station what are the steps which you will be following?	<p>Step1: Introduction statement Step2: Gather info. Step3: Engage them in conversation Step4: Build bridges to the next step (whether it's making a sale or serving the customer)</p>
4	Explain 1 st and 2 nd step elaborately.	<p>Greeting step 1- Give an introduction statement: How about opening up with something like "Thanks for coming in!" Greeting step 2 - Gathering Free Information After the warm, inviting and professional greeting, will have to engage the customer in conversation. Seeking for the information they want from us.</p>
5	What are the key elements for a new introduction to a new person?	<ol style="list-style-type: none"> 1. Your name 2. How you can help them (Experience, qualifications ...etc.) 3. An open question to start the conversation
6	What are 6 important things to remember about greeting?	<ol style="list-style-type: none"> 1. Make the customer feel welcome and appreciated. 2. Make eye contact when greeting the customer. 3. Never address a customer from behind – that's scary and creates unwanted pressure. 4. Address customers from a reasonable distance -- no shouting across the store/work station. 5. Create your unique, memorable greeting 6. Never stop greeting! If you pass customers/colleagues in the store/company, make sure to acknowledge them with a friendly smile.
7	What should you expect from a customer or client?	<ol style="list-style-type: none"> 1. A person on the receiving end of what the business offers 2. Someone who is willing to pay a fair price for a quality product and wants to be neither over-charged nor under-served 3. The reason the company is in business 4. Someone who has certain needs and wants them filled and who, if we cannot fill them, will go to a competitor who will.

8	Explain these terms of the customer needs, wishes and expectations.	<p>Needs: These underlie wishes and expectations and are the things customers are unable to do without.</p> <p>Wishes: These refer to the way in which our customer would prefer to satisfy a specific need, but they may not have the resources to meet these wishes.</p> <p>Expectations: These spring from the customers" needs and wishes but are also influenced by:</p> <ul style="list-style-type: none"> • The company's image or reputation in the market • The customer's previous perceptions and their experience with the company • The company's advertising.
9	How will you identify customer needs, wishes and expectations?	<ul style="list-style-type: none"> • Involve the customers in developing new services • Use market research tools such as questionnaires, taste testing and observation to identify • Their likes and dislikes, needs and wants, expectations and experiences
10	How do you organize and conduct a series of focus groups and what is the benefit of this approach?	<p>Establish a regular meeting between the establishment and specifically chosen customers.</p> <p>The customers should represent across-section of your clientele and each focus group meeting should have a well-defined focus point. The person chairing the focus group guides discussion, debate, opinion, feedback about the topic and records the input from the focus group members. This information becomes the basis for management-staff discussion and eventual policy modification, or creation. Focus groups are an excellent way of bringing "customer focus" to your service standards and service delivery.</p>
11	What does it mean by actively listening to the customers?	<p>Prompt the customers to communicate with you, follow-up on non-verbal cues when they talk to you as body language often indicates a hidden desire to say something. Encourage them to expand and clarify problems and criticism.</p>
12	What does the phrase mean by "seeing from customer's eye"?	<p>We have to strive to find out what our establishment and our service looks like from the customers" point of view. We can become too obsessed on what the service looks like from the delivery viewpoint, when really the customer sees it from a "receive" viewpoint. We need to identify how our service looks from the other side</p>
12	Feedback is very important when it comes to improving customer services, How do we get customer feedback?	<p>By implementing written response sheets and questionnaires, but also encouraging staffs to be proactive in soliciting verbal feedback from customers in a face-to-face setting such as at check-out, after they have finished their meal and via personal follow-ups with hosts and clients after functions</p>
13	How do you meet the customer needs? Explain in step by step process.	<ol style="list-style-type: none"> 1. Explain: Identify what your customers need from you through keyword research, focus groups, or social listening. 2. Distribute: Distribute the information to relevant stakeholders in your organizations 3. Collect: Collect customer feedback on how your efforts meet their expectations.

		4. Create: Craft product features or create content that speaks to your customer's needs
14	Developing standards and planning to address key quality service issues can be considerably tough. What are the important factors to consider by the management in developing standards?	<ul style="list-style-type: none"> • Different areas for which standards and plans may be created • Development process for plans and standards • Identifying several approaches towards quality management for staff and customers.
15	What factors should be taken into consideration while developing quality customer standards?	<ul style="list-style-type: none"> • Establish a "customer service" team of interested, experienced and dedicated staff – these will be your reference group and form the basis of the planning stage • Look at what other venues are providing in terms of service – try to describe their service in writing wherever possible • Identify the areas in the venue about which you believe there needs to be a customer service standard and a plan • Determine the standards to apply to the identified areas with reference to your image, reputation and advertising <ul style="list-style-type: none"> ○ Value-for-money for the customer ○ What the opposition is doing ○ Identified customer expectations • Incorporate the standards into a formal plan – this plan should identify: <ul style="list-style-type: none"> ○ Dates for implementation ○ Dates for review. Etc.
16	What are common monitoring methods?	<ul style="list-style-type: none"> • Workplace observation – watching what goes on at work, reading customer body language and measuring waiting times • Talking to customers – to get their feedback of service delivery • Talking to staff – to get their impressions, to identify obstacles to planned service delivery standards • Reading customer complaints and feedback • Analyzing business statistics – a reduction in patronage can indicate a need for attention to be paid to customer service, and can also indicate needs in other areas such as price, product.
17	What are areas of monitoring and to evaluate?	Marketing activities are a recognized way of monitoring and evaluating many things and may include the use of customer surveys as well as evaluation of any promotions conducted by the venue such as advertising. This includes the use of billboards, direct mail, radio, and TV, Internet and incentive promotions.

18	Inquiry management need to be tackled systematically to ensure continued growth of business. What are important six tips of managing the workflow of customer service inquires for positive results?	<ol style="list-style-type: none"> 1. Develop a proper organizational chart 2. Prioritize support for customer service inquiries 3. Categorize inquiries 4. Enable self-service 5. Analyze the data 6. Test Different approaches
19	Explain the 3 rd and 4 th tips of managing the workflow of customer service inquires?	<p>Categorize Inquiries</p> <ul style="list-style-type: none"> • Once each customer service inquiry is prioritized, it should be segmented according to the type of request. In this way, the inquiry gets to the appropriate team member immediately for timely and effective responses. • First, it is important to define customer service categories, and then assign the correct people to each category based on their strengths and weakness. <p>Enable Self-Service</p> <ul style="list-style-type: none"> • While a large percentage of customers prefer more complicated customer service inquiries to be handled by a live person, there are many query cases that can be handled by self-service. For issues that show up again and again, and for those customer service inquiries with simple answers, you do not need to waste time or money responding over the phone, in live chat, or through email.
20	Please mention the 5 steps process for handling customer complaints.	<ol style="list-style-type: none"> 1. Dig deeper of the problem by asking the right questions 2. Identify the type of customer you're dealing with 3. Respond to the customer quickly 4. Present a solution, and verify that the problem is solved 5. Log the complaint so you can track trends
21	Explain the 1 st and 2 nd steps for handling customer complaints.	<p>Step 1: Dig deeper by asking the right questions Complaints from an angry customer can contain insights, and it should be our priority to seek out the point of friction. Further question and digging can help to get to the source of the issue.</p> <p>Step 2: Identify the type of customer you're dealing with When dealing with angry customers, react with firm politeness instead of responding rudely and avoid mirroring their confrontational behavior. When responding, avoid excuses and just get to the solution. Customers who contact you frequently. Stay patient and avoid coming across as frustrated when responding to these.</p>
22	What are anger management techniques?	<ul style="list-style-type: none"> • Time out – take a break for a bit • Controlled breathing • Use calming self-statements such as “Cool it. You can handle this.”

		<ul style="list-style-type: none"> • Relaxation skills • Changing beliefs that contribute to anger • Physical activity • Problem solving strategies • Write things down or compose an unsent letter • Learn assertiveness skills • Better Communication • Work on responses that help with your anger – develop a list of things to say to yourself before, during and after situations in which you may get angry.
23	What are recommended resources that can help to manage anger	<ul style="list-style-type: none"> • Support groups/ health support • Books • Courses • Qualified counsellor or psychologists
24	What are steps in dealing with irate customers?	<ol style="list-style-type: none"> 1. Remain Calm 2. Don't take it personally 3. Use your best listening skills 4. Actively sympathize 5. Apologize gracefully 6. Find a solution 7. Take a few minutes on your own
25	Explain the 3 rd and 6 th step of dealing with irate customers?	<p>Use your best listening skills: The first thing an angry customer wants is to vent. To do so, they need someone to listen—and, for better or worse, you are that person. Listening patiently can defuse a situation, as long as the customer feels acknowledged in his or her complaint. Hear them out. When they are done talking, summarize what you've heard and ask any questions to further clarify their complaint. Body language can be critically important here. Keep eye contact. Stand or sit up straight. Keep your arms uncrossed. Show how closely you're paying attention to their problem.</p> <p>Find a solution: Once you understand why the customer is unhappy, it is time to offer a solution. Ask him what he feels should be done or put forward your own fair and realistic answer to the problem. In most cases, that's all the customer is looking for and may result in providing some degree of satisfaction.</p>
26	What are anger management strategies?	<p>Recognising the signals of anger and becoming aware of how your anger works is the first step to change. The goal of anger management strategies is to not to suppress these emotions but reduce the 'heat' associated with your emotional feelings by offering alternatives that can help you manage them better. You can't get rid of, or avoid, the things or the people that may anger you, but you can learn to recognize anger warning signs and control your reactions.</p>

2. PT=Practical Test

#	Practical Activity	Points to evaluate
1	Undertake customer service role play	<p>Perform following role play activities.</p> <ol style="list-style-type: none"> 1. Greet Customers and colleagues as they walk into an office or shop. During this role play, student performance needs to be measured and evaluated to assess their competency to greet customers and colleagues 2. Deliver service to customers as they approach customer desk and may include simulated shop or service counter. Referred exercise will involve serving customers and individual students will be assessed and evaluated based on their capacity to greet customers and delivery of service to customers.
2	Assignment on Customer Need Assessment	<p>Students will produce an assignment that will interact with real customers across various SMEs to determine customer needs and compile a report detailing customer needs. Referred Assignment will be used to assess and evaluate the methodologies and strategies applied in determining customer needs.</p>
3	Perform simulated front desk activity	<p>Referred Front Desk role play will include the following.</p> <ol style="list-style-type: none"> 1. Handle customer inquiries 2. Handle customer complaints 3. Handle and manage angry customers <p>Referred three activities can be performed separately to ensure students are assessed and evaluated on handling of customer inquiries, complaints and managing angry customers.</p>

3. OW =Observation at work Place

#	Activities to be observed	Evaluation of skills competencies
1	Observe customer service role play	<p>During the customer service role play, make sure the students use proper body language, tone and the sounds in greeting customers.</p> <p>Also ensure that individual students are assessed in providing service to customers.</p>
2	Inspect and evaluate the assignment that focused on determining customer needs	<p>Students will produce an assignment that will interact with real customers across various SMEs to determine customer needs and compile a report detailing customer needs. Referred Assignment will be used to assess and evaluate the methodologies and strategies applied in determining customer needs.</p>
3	Observe simulated front desk activity	<p>While observing the front deck performance, make sure students are assessed on handling of customer inquiries, complaints and managing of angry customers.</p>

4. OQ=Oral Questioning

#	Questions	Answers
1	How to greet customers?	Students should provide detailing theoretical knowledge related to greeting customers and they should also demonstrate practical aspects such as giving examples on greeting customers.
2	Explain methods of identifying customer needs	Students should begin answering this question by detailing the theoretical foundation on which customer needs can be determined followed by explanation on various strategies and protocols that may be used including their details.
3	Appropriate rapport for delivering quality customer care	Students need to list the qualities of good customer care with listing and detailing of the appropriate rapport that need to be established between the client and the customer for enhanced customer care.
4	Explain methods to apply for effective handling customer complaints	Students should competently explain methods of handling customer complaints by listing and details the theoretical aspects followed by giving practical examples.
5	Explain strategies for managing angry customers	Often, we find customer are dissatisfied with the service provided and they bring negative image to the establishment and the services it provides. Students should answer this question by detailing strategies and techniques for managing angry customers and taking care of them during such unwanted situations.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc. Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.

Unit-5: Perform computer operations

Unit No	05
Unit Title	Perform computer operations
Unit Code	CONCM03V2/20

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Start computer, system information and features							
Adjust workspace, furniture and equipment to suit user ergonomic requirements	✓	✓	✓	✓		✓	✓
Ensure work organization meets organizational and occupational health and safety (OHS) requirements for computer operation	✓	✓	✓		✓	✓	✓
Start computer or log on according to user procedures	✓	✓		✓	✓	✓	
Identify basic functions and features using system information	✓	✓	✓	✓		✓	✓
Customize desktop configuration, if necessary, with assistance from appropriate persons	✓	✓	✓	✓		✓	✓
Use help functions as required	✓	✓	✓		✓	✓	✓
2. Organize files using basic directory and folder structures							
Create folders/subfolders with suitable names	✓	✓	✓	✓		✓	✓
Save files with suitable names in appropriate folders	✓	✓	✓		✓	✓	✓
Rename and move folders/subfolders and files as required	✓	✓		✓	✓	✓	
Identify folder/subfolder and file attributes	✓	✓	✓	✓		✓	✓
Move folders/subfolders and files using cut and paste, and drag and drop techniques	✓	✓	✓	✓		✓	✓
Save folders/subfolders and files to appropriate media where necessary	✓	✓	✓		✓	✓	✓
Search for folders/subfolders and files using appropriate software tools	✓	✓		✓	✓	✓	
Restore deleted folder/subfolders and files as necessary	✓	✓	✓	✓		✓	✓
3. Print information							
Print information from installed printer	✓	✓	✓	✓		✓	✓
View progress of print jobs and delete as required	✓	✓	✓		✓	✓	✓
Change default printer if installed and required	✓	✓		✓	✓	✓	

4. Apply web browsing skills							
Introduction to WWW	✓	✓	✓	✓		✓	✓
Acknowledge to gather relevant information from reliable sources	✓	✓	✓		✓	✓	✓
Use of search engines	✓	✓		✓	✓	✓	
Basic interaction of browser	✓	✓	✓	✓		✓	✓
Creating bookmarks in browser	✓	✓	✓	✓		✓	✓
Upload and download files	✓	✓	✓		✓	✓	✓
Navigation of hyperlink	✓	✓		✓	✓	✓	
5. Shut down computer							
Close all open applications	✓	✓	✓	✓		✓	✓
Shut-down computer according to user procedures	✓	✓	✓		✓	✓	✓
6. Basic Microsoft Word and Excel skills							
Ensure data is entered, checked and amended in accordance with organizational and task requirements, to maintain consistency of design and layout	✓	✓	✓	✓		✓	✓
Format spreadsheet using software functions; to adjust page and cell layout to meet information requirements, in accordance with organizational style and presentation requirements	✓	✓	✓		✓	✓	✓
Ensure formulae are used and tested to confirm output meets task requirements, in consultation with appropriate personnel as required	✓	✓		✓	✓	✓	
Use manuals, user documentation and online help to overcome problems with spreadsheet design and production	✓	✓	✓	✓		✓	✓
Format document using appropriate software functions to adjust page layout to meet information requirements, in accordance with organizational style and presentation requirements	✓	✓	✓	✓		✓	✓
Use system features to identify and manipulate screen display options and controls	✓	✓	✓		✓	✓	✓
Use manuals, user documentation and online help to overcome problems with document presentation and production	✓	✓		✓	✓	✓	

Note:

- ✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play

1. Written questions

	Question	Answer
1	How can you improve a good posture and prevent lower back pain?	<ol style="list-style-type: none"> 1. Adjust the chair height 2. Ensure your feet are firmly on the floor 3. Adjusting the chair angle 4. Adjusting the backrest angle 5. Setting the backrest height 6. Positioning the armrest height
2	Explain briefly one way to improve a good posture and prevent lower back pain?	<ol style="list-style-type: none"> 1. Positioning the armrest height <ul style="list-style-type: none"> • If the armrest can be adjusted, position them so that they fit under the desk. • If you are taller than average, the above recommendations for adjusting your chair may not be suitable. • Consider an Adjustable Standing Desk or a Sit Stand Workstation to bring the desk to your level.
3	How can you correctly set up your workplace to improve posture and correct support?	<ul style="list-style-type: none"> • Adjust the location of the keyboard to be 10-15cm in front of the edge of the desk. • The wrists should be straight and hovering over the desk. • The mouse should be as close as possible to the keyboard. • If you are using one monitor, position it directly in front. It should be an arm length away and angled slightly upward towards the eyes. • A document holder should be ideally positioned between the monitor and the keyboard. • Phone, calculators, and note-pads are all ideally positioned within easy reach.
4	Does your workstation require a footrest, explain your answer?	Yes. When setting up an ergonomic workstation, ensuring your legs and feet are well supported is crucial. If your feet aren't firmly flat on the floor, a footrest will be needed to improve your posture. A footrest will help in attaining the right foot elevation, leg and knee position.
5	State 3 general hazards to look carefully working in a computer station.	<ul style="list-style-type: none"> • Electric short-circuits • Radiation exposure • Noise exposure <p>Etc.</p>
6	What are 4 major functions of a computer?	<ul style="list-style-type: none"> • Taking data and instructions from a user • Processing the data as per instructions • Displaying data • Storing the processed data
7	What are technical terms of the basic function of a computer?	<ul style="list-style-type: none"> • Input function • Process function • Output function

		<ul style="list-style-type: none"> • Storage function
8	What are most common and modern input devices?	<ul style="list-style-type: none"> • Keyboard • Mouse • Scanners • Microphones • USB drives • Webcams <p>Etc.</p>
9	What does the computer uses when processing the input data?	CPU
10	What is a CPU?	It processes user instructions, executes scripts and programs, and runs commands of the OS that provide a platform for installing and using application software.
11	What are different forms of output functions that can be displayed?	<ul style="list-style-type: none"> • Monitor • Printer • Speaker • Displays <p>Etc.</p>
12	What are two types of storage components?	<p>Temporary: Temporary storage components are used to store data temporarily. Data stored in a temporary storage component is erased when the system is shutdown. RAM is a compulsory temporary storage component. A computer uses the ram to store the running applications and their data.</p> <p>Permanent: Permanent storage components are used to store data permanently. Data stored in a permanent storage component is not erased when the system is shutdown. The hard disk is the most common permanent storage component</p>
12	What are the benefits of naming conventions?	Naming records consistently, logically and in a predictable way will distinguish similar records from one another at a glance, and by doing so will facilitate the storage and retrieval of data. Through consistency and the application of logical standards we benefit from secure storage, and the ability to locate and access information.
13	What is the Web?	The Web, also known as the World Wide Web (WWW), is essentially a collection of an uncountable number of pages of information displayed on the Internet
14	Name three examples of web browsers?	<ul style="list-style-type: none"> • Mozilla Firefox • Safari • Google Chrome
15	How do you find information using a search engine?	Type the web address www.google.com into the address bar at the top of your screen. Then hit Enter on your keyboard

16	All the files in a computer must be identifiable and traceable. How can you achieve a good practice? Provide examples.	It can be done by applying referencing to all documents/files. For example: Document/file references will include: <ul style="list-style-type: none"> • file name, or full file path including file name • name/role of file author(s) or originator(s) • date of creation, edit or event which is the subject of the document/file • version number if applicable
17	What types of documents can you create with WORD and give examples?	<ul style="list-style-type: none"> • Letters: personal or business • Notices: basic flyers, menus and checklists • Reports- for school, work or a special interest group
18	What are mostly used commands in the Home Tabs of WORD, and explain each briefly?	<p>1. Font group: The Font Group contains commands that change the appearance of the font. Font is the set of characters (letters, numbers, punctuation, etc.) in a particular style.</p> <p>2. Style group: A document created from a template, like the one you opened earlier (Facet design blank), has pre- designed styles for different parts of the document, such as paragraphs and headers.</p>
19	What is EXCEL and why people use it?	Excel is a spreadsheet program that allows you to store, organize, and manipulate data. Data can be text, numbers, and formulas. The data is entered into cells which are organized into columns and rows. Many people use Excel to keep a budget, use charts and graphs to show data, track sales for a business, and much more.

2. PT=Practical Test

#	Practical Activity	Evaluate Performance of the students
1	Undertake proper starting of the workplace computers	While performing the task, students will demonstrate knowledge and skills on the use of the computer and understand name of various parts and functions of workplace computers. Students will use proper starting procedures for safe and long-term use of the computers.
2	Possess skills to organise and manage folders and files in the computer	Workplace computers will have several documents and folders and need to be properly handled and managed. During performing the practical activity, student will know where different folders are located and follow common procedures of handling workplace documents stored within the computers.
3	Perform simple print job using the computer and the printer.	Prior to giving the print job, students need to competently understand functions of different computers and printers and their scope of usage. In this regard, should check the printer connection to the computer and test the printer performance prior to giving a workplace document for printing.
4	Work on Microsoft Word and Excel files	While attending this task, students need to create and open new files on excel and word and work on these files. They should know simple features associated with these applications and apply them to workplace tasks.

5	Perform proper shut down of computer	At the end of shift workplace computers are shut down to leave them safe for the next business day. Make sure student safely perform this task and follow workplace instructions and procedures on the use of the computers at the workplaces.
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3. OW = Observation at work Place

#	Activity to observe	Evaluate and assessment of the observations
1	Starting of the workplace computers	While starting the workplace computers, make sure the students follow safe and effective procedures and in particular, undertake standard operational procedures while starting the computers and preparing them for the workplace operations.
2	Organise and manage folders and files in the computer	Observe how the students use and manage the folders created on the workplace computers for the different workplace documents. Also evaluate competency of the students in handling and management of the folders and cross check the Standard Operating Procedures in using the workplace computers
3	Perform simple print	As the student attempts to attend simple print, make sure that appropriate procedures are followed while performing the print job.
4	Work on Microsoft Word and Excel files	While student creates and works on the word and excel files, makes sure their skill level and use of various tools are properly applied and the documents are properly saved and opened based on the work being performed.
5	Perform proper shut down of computer	As the students shut down computers, make sure they follow proper procedures and align these procedures to the workplace standards of the respective organizations. While shutting down, make sure manufacture recommendations are also taken applied.

4. OQ=Oral Questioning

#	Questions	Answers
1	What procedures are applied in starting the workplace computer?	<p>Explain and demonstrate the following.</p> <ul style="list-style-type: none"> ✓ Correct and healthy postures while sitting at computers ✓ Name of the various elements of the computers and their functions ✓ List the workplace procedures if any related to starting the workplace computers ✓ Explain correct steps to be used in starting the computer ✓ Start the computer system and prepare it for use

2	Explain how to use and manage the folders in the computer?	Explain and demonstrate the following. <ul style="list-style-type: none"> ✓ Reasons for creating folders and their applications ✓ Create folder and show to the assessor ✓ Show different folders created on the computer and explain functions
3	Explain steps used for making simple print	Explain and demonstrate the following. <ul style="list-style-type: none"> ✓ Explain the steps involved in making a simple print using the printer connected to the computer ✓ Select a document and show printer setting and giving print command ✓ Take a simple print
4	Explain how to apply browsing skills?	Explain and demonstrate the following. <ul style="list-style-type: none"> ✓ Use of search engines ✓ Basic interaction of browser ✓ Creating bookmarks in browser ✓ Upload and download files ✓ Navigation of hyperlink
5	Explain common tools and applications used in both Microsoft Word and Excel?	Explain and demonstrate the following. <ul style="list-style-type: none"> ✓ Explain functions of both Microsoft Word and Excel applications ✓ Create a small Microsoft Word file and save it ✓ Create a small Microsoft excel file and save it ✓ Open and edit them using different tools
6	What procedures are applied in shutting down the workplace computer?	Explain and demonstrate the following. <ul style="list-style-type: none"> ✓ Explain proper shutting down procedures of workplace computers ✓ Demonstrate steps involved in shutting down computers ✓ Perform shutting down of workplace computers in front of the assessor.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.

3	Other Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>
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Unit-6: Provide first aid

Unit No 06
 Unit Title Provide first aid
 Unit Code CONCM06V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Assess the situation							
Physical hazards and risks to self and others' health and safety identified	✓	✓	✓	✓		✓	✓
Immediate risks to self and casualty's health and safety minimized by controlling hazards in accordance with occupational health and safety requirements	✓	✓	✓		✓	✓	✓
The situation assessed and prompt decision taken on actions required	✓	✓		✓	✓	✓	
Assistance sought from relevant persons/authority, as required and at the appropriate time	✓	✓	✓	✓		✓	✓
2. Apply basic first aid techniques							
Casualty's physical condition assessed by visible vital signs	✓	✓	✓	✓		✓	✓
First aid provided to stabilize the patient's physical and mental condition in accordance with enterprise policy on provision of first aid and recognized first aid procedures	✓	✓	✓		✓	✓	✓
Available first aid equipment used as appropriate	✓	✓		✓	✓	✓	
3. Monitor the situation							
Back-up services appropriate to the situation identified and notified promptly	✓	✓	✓	✓		✓	✓
Information about the patient's condition reported accurately and clearly to emergency services personnel or health professionals	✓	✓	✓		✓	✓	✓
4. Prepare required documentation							
Documented emergency situations according to enterprise procedures	✓	✓	✓	✓		✓	✓

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1. Written questions

	Question	Answer
1	Define the term First Aid?	First aid is any care given to an injured or ill person (called a 'casualty') before professional medical assistance (ambulance, paramedics, nurse, or doctor) arrives on the scene to take control of the situation
2	What can include in the provision of First Aid?	<ul style="list-style-type: none"> • Mouth-to-mouth resuscitation – if the casualty is not breathing • Cardio-Pulmonary Resuscitation (CPR) – where there is no breathing and no pulse • Control of bleeding – to limit blood loss • Wound care – to limit blood loss and infection by covering wounds • Treatment for burns and scalds – including treatment for electric shock • Bandaging and splinting – to fractures and sprains.
3	What are important to take into account when providing first aid?	<ul style="list-style-type: none"> • Protect yourself and others at all times against injury or harm – persons delivering first aid should not become casualties • The casualty must be protected against further harm or injury • Whenever there is a need to administer first aid make sure you notify your supervisor immediately to arrange for professional help to be called • Wear protective gloves when administering first aid to protect against infection.
4	How to identify hazards?	<ul style="list-style-type: none"> • Use common sense – this is the most important aspect • Use your sense of sight – look for things that could present a problem or danger. Look carefully in all directions. Be alert to smoke, fire and emerging issues • Use your sense of hearing – listen for escaping gas, crackling of flames or creaking of wood and metal • Use your sense of touch –vibrations or heat • Use your sense of smell –gas or smoke.
5	In order to minimize the risks of the hazards. Where general actions you can reduce these issues on site?	<p>Casualties should not be moved until they have been assessed as being safe to move but if there is a serious and immediate risk of extra injury to a casualty from an identified hazard it is standard practice to move them away from the hazard.</p> <p>If uninjured bystanders are near an identified hazard, they must be told to move away to a safe location.</p> <p>Whenever there is identified danger from fire, gas leaks or smoke the emergency fire authorities must be called.</p> <p>Where there is an identified hazard from electricity, the electricity supply company or someone from within the</p>

		workplace with knowledge of how to turn off the power must be contacted.
6	What are other often actions that can include in diminishing of risk of hazards?	<ul style="list-style-type: none"> • If there is a fire near the casualty – call the fire brigade, move the casualty out of the danger zone or fight the fire with nearby hoses, fire blanket or extinguisher • If the casualty’s situation is being made worse by rain or sunshine – provide cover to the person • If gas is leaking from a damaged appliance – turn off the gas at the stop valve and make sure no one is smoking • If unstable items are near-by and posing a risk of – either move the items or casualty • If the casualty is in a position where they are likely to be run over by vehicles – move them or take action to stop traffic.
7	If a casualty is unconscious and unsure of an injury protecting neck is very vital. How can you help to protect the neck in case of this situation?	<ul style="list-style-type: none"> • Keep the casualty still – tell the casualty not to move • Kneel behind the head and place your hands on either side to support it – with the head, neck and spine in a straight line • Put rolled up towels, blankets, or clothing on each side of the casualty’s head to keep it from moving.
8	The “fireman’s carry” is used to move unconscious people or casualties who are unable to walk. What are the steps of fireman’s carry?	<ul style="list-style-type: none"> • Place the casualty face down • Grab the person around the waist, and help bring him or her to a standing position, facing you • Keep one arm around his or her waist when you have him or her in the standing position grasp the casualty’s right arm in your left hand and swing his or her arm around the back of your neck • Pull him or her across your shoulders by bringing his or her raised arm around your neck and over your shoulder. In this position, the injured person’s legs will be over one shoulder, and his or her arm and head will be over the other shoulder • Reposition your hand from the person’s waist to the back of his or her knee • Lift yourself with the injured person into a standing position.
9	What does DRABC stands for?	<p>D for danger – assess the situation R for response – check consciousness, check on vital signs A for airway – open airway B for breathing – check respiration rates C for circulation – give chest compressions.</p>
10	What are the important aspects of Danger in DRABC?	<ul style="list-style-type: none"> • Check for danger to yourself, the casualty and others. Look for obvious, immediate, life-threatening hazards such as fire, the possibility of a gas explosion, and electrical hazards

		<ul style="list-style-type: none"> • If there is danger around, you will need to move yourself and your casualty to prevent further injury to anyone • If you think the casualty has a spinal injury, take care to stop more damage to the spine by stopping movement of the casualty's neck and back.
11	What are the important aspects of Airway in DRABC?	<ul style="list-style-type: none"> • If casualty is not breathing, open the airway by placing one hand on their forehead and gently tilt the head back by lifting the chin • Remove any visible obstructions (vomit, mucus, saliva, false teeth, loose or broken teeth, food, tongue) from the mouth and nose to unblock the airways • If obstructions are present the casualty will not be able to breathe and the obstruction will also impede the provision of rescue breathing/mouth-to-mouth resuscitation also known as ear (expired air resuscitation).
12	How can you find a pulse? Explain briefly.	<p>If there is no pulse and there is no sign of breathing, cpr (cardio-pulmonary resuscitation) must commence.</p> <p>A good point for taking the pulse is the neck (carotid arteries). Place the middle and index fingers on the casualty's larynx (voice box).</p> <p>Move the fingers to the side until you feel the groove (between the bone and the muscle) next to the trachea (wind pipe), then press on the groove until you feel the pulse.</p> <p>Place the tips of your index and middle fingers over the pulse site and press gently. Using a watch with a second hand. Count the pulse for 15 seconds and then multiply by four to obtain beats per minute.</p> <p>Write down your findings.</p>
12	What is the normal pulse rate of an adult and what happens when the pulse rate rises more?	<p>A normal pulse rate for an adult when resting is 60 to 80 beats per minute. The average is 72 beats per minute.</p> <p>A resting pulse rate of more than 80 beats per minute is a higher than normal pulse rate. This can be caused by shock, bleeding, heat, dehydration, fever, pain or exercise.</p>
13	Before a causal assessment of the casualty what kind of information you must attain from the casualty? State why you would require this information.	<p>If the casualty is conscious and able to talk, speak to them to obtain whatever history is available relating to their condition. By putting the history, signs and symptoms together, you will have a better assessment of the injury.</p>
14	What are the key aims of first aid and explain each of them shortly?	<ol style="list-style-type: none"> 1. Preserve life: the overriding aim of all medical care, including first aid, is to save lives and minimise the threat of death. 2. Prevent further harm: also, sometimes called prevent the condition from worsening, or danger of further injury. This covers both external factors, such as moving a patient away from any cause of harm, and applying first aid

		<p>techniques to prevent worsening of the condition, such as applying pressure to stop a bleeding which becomes serious.</p> <p>3. Promote recovery: first aid also involves trying to start the recovery process from the injury, and in some cases might involve completing a treatment, such as in the case of applying a plaster to a small wound.</p>
15	<p>In a sudden emergency situation such Obstruction (choking). How will you perform ABC intervention steps to before giving treatment?</p>	<p>Obstruction (choking) is a life-threatening emergency. For these reasons, when we get to the injured, care must first be brought to his or her airway (A) to ensure it is clear. Following evaluation of the airway, a first aid attendant would determine adequacy of breathing (B) and provide rescue breathing if necessary.</p> <p>Assessment of circulation (C) is now not usually carried out for patients who are not breathing. First aiders must conclude indirectly that unconscious patients, without breathing have no circulation and go straight to chest compressions. Pulse checks may be done on less serious patients. Once the ABCs are secured, first aiders can begin additional treatments, as required.</p>
16	<p>What are two types of wounds?</p>	<p>Open wound and closed wounds</p>
17	<p>Explain what open and closed wounds are?</p>	<ul style="list-style-type: none"> • In open wounds, the skin is cracked open, leaving the underlying tissue exposed to the outside environment, which makes it more vulnerable to bleeding and infections. • In closed wounds, the skin is intact and the underlying tissue is not directly exposed to the outside world. Even with the skin intact, the damage can reach down to the underlying muscle, internal organs and bones. That is why these kinds of wounds can be complicated by severe bleeding, large bruises, nerve damage, bone fractures and internal organ damage.
18	<p>Mention 3 types of open wounds.</p>	<ul style="list-style-type: none"> • Incisions or incised wounds, caused by a clean, sharp-edged object such as a knife, razor, or glass splinter • Lacerations, irregular tear-like wounds caused by some blunt trauma • Abrasions, superficial wounds in which the topmost layer of the skin (the epidermis) is scraped off. Abrasions are often caused by a sliding fall onto a rough surface
19	<p>Mention 2 types of closed wounds.</p>	<ul style="list-style-type: none"> • Contusions, more commonly known as bruises, caused by a blunt force trauma that damages tissue under the skin. • Hematomas, also called a blood tumor, caused by damage to a blood vessel that in turn causes blood to collect under the skin.
20	<p>What are the following measures that can be</p>	<p>1. Stop the bleeding</p>

	taken in giving first aid to a victim of an open wound?	<ol style="list-style-type: none"> 2. Minor cuts and scrapes usually stop bleeding on their own 3. If they don't, apply gentle pressure with a clean cloth or bandage. Hold the pressure continuously for 20 to 30 minutes and if possible, elevate the wound. 4. Clean the wound 5. Rinse out the wound with clear water. Soap can irritate the wound, so try to keep it out of the actual wound. If dirt or debris remains in the wound after washing, use tweezers cleaned with alcohol to remove the particles. To clean the area around the wound, use soap and a washcloth. 6. Cover the wound 7. If the bleeding slows, cover the wound with a clean dressing and bandage. Dressings and bandages can help keep the wound clean and keep harmful bacteria out. A dressing is a sterile pad or compress (usually made of gauze or cotton wrapped in gauze) used to cover wounds, to control bleeding and/or prevent further contamination
21	What are the following measure that should be taken in giving first aid to a victim of a closed wound?	<ol style="list-style-type: none"> 1. Application of direct pressure, preferably with ice wrapped in a cloth, for several minutes, in order to arrest the bleeding as well as to reduce the swelling. 2. Elevation of the affected region will also support in reducing the pressure as well as the re-absorption process and it should be practiced as and when appropriate.
22	What are reasons or cases to seek help immediately from a health professional?	<ul style="list-style-type: none"> • If the wound is in the head, chest or abdomen (unless it is minor). • If there is blue, white or cold skin, numbness, tingling, loss of feeling, or the person is unable to move a limb below the wound. • If your tetanus shots are not up to date, especially if the object that caused the puncture was dirty, such as a rusty nail or farm implement. • If a deep wound to the foot occurred through a shoe. • If an animal bite is severe and may need stitches, or if it is on the hand or face. <p>Etc.</p>
23	What is external bleeding?	External bleeding is generally described in terms of the origin of the blood flow by vessel type.
24	What are the categories of external building	<ol style="list-style-type: none"> 1. Arterial bleeding 2. Venous bleeding 3. Capillary bleeding
25	Explain what venous bleeding is?	Venous bleeding: This blood is flowing from a damaged vein. As a result, it will be blackish in colour (due to the lack of oxygen being transported) and will flow in a steady manner. Caution is still indicated; while the blood loss may not be

		arterial, it can still be quite substantial, and can occur with surprising speed without intervention.
26	What is internal bleeding?	Internal Bleeding is one of the most serious consequences of trauma. It may occur after any significant physical injury.
27	What are the main types of trauma that can cause internal bleeding?	<ol style="list-style-type: none"> 1. Blunt trauma - This kind of trauma happens when a body part collides with something else, usually at high speed. Blood vessels inside the body are torn or crushed either by shear forces or a blunt object. Examples are car accidents, physical assaults, and most falls. 2. Penetrating trauma - This happens when a foreign object penetrates the body, tearing a hole in one or more blood vessels. Examples are gunshot wounds, stabbings, or falling onto a sharp object.
28	What are the most serious internal bleeding which can be caused by a trauma?	<ul style="list-style-type: none"> • Head trauma with internal bleeding (intracranial hemorrhage) • Bleeding around the lungs (hemothorax) • Bleeding around the heart (hemopericardium and cardiac tamponade) • Tears in the large blood vessels near the center of the body (aorta, superior and inferior vena cava, and their major branches) • Damage caused by trauma to the abdomen such as liver or spleen lacerations or perforation of other soft organs <p>Etc.</p>
29	What are the following measures that need to be taken in giving first aid to a victim of external bleeding?	<ol style="list-style-type: none"> 1. Wash your hands to avoid infection and put on gloves 2. Lay on the injured person down and cover the person to prevent loss of body heat. 3. If possible, position the person's head slightly lower than the trunk or elevate the legs and elevate the site of bleeding 4. While wearing gloves, remove any obvious dirt or debris from the wound. Don't remove any large or more deeply embedded objects. 5. Your principal concern is to stop the bleeding.
30	How can you stop bleeding by applying pressure directly on the wound?	<ul style="list-style-type: none"> • Use a sterile bandage or clean cloth and hold continuous pressure for at least 20 minutes without looking to see if the bleeding has stopped. • Maintain pressure by binding the wound tightly with a bandage or clean cloth and adhesive tape. • Use your hands if nothing else is available. • If the bleeding continues and seeps through the gauze or other material you are holding on the wound, don't remove it. Instead, add more absorbent material on top of it

31	If bleeding doesn't stop while applying direct pressure on the wound how are you going to stop the bleeding?	<ul style="list-style-type: none"> • If the bleeding doesn't stop with direct pressure, apply pressure to the artery delivering blood to the area. • Squeeze the main artery in these areas against the bone. Keep your fingers flat. • With your other hand, continue to exert pressure on the wound itself.
32	What is fracture and what the main types of fractures?	A fracture is the medical term for a broken bone. There are many types of fractures, but the main categories are open, and closed.
33	Explain an open fracture.	An open fracture is one in which the bone breaks through the skin. This is an important difference from a closed fracture because with an open fracture there is a risk of a deep bone infection
34	Explain a closed fracture.	A closed fracture is when the bone breaks but there is no puncture or open wound in the skin.
35	What are the symptoms to identify a fracture?	DOTS: D for deformity, O for open wounds, T for tenderness and S for swelling
36	What are the following measure to be taken in giving first aid to a victim with bone injury?	<ul style="list-style-type: none"> • Don't move the person except if necessary to avoid further injury. Take these actions immediately while waiting for medical help: <ul style="list-style-type: none"> ○ Stop any bleeding ○ Apply pressure to the wound with a sterile bandage, a clean cloth or a clean piece of clothing.
37	What is the purpose of splinting?	Splinting reduces pain, prevents further damage to muscles, nerves and blood vessels, prevents closed fracture from becoming open fracture and reduces bleeding and swelling.
38	In case of emergency what can serve as a splint?	In an emergency, almost any firm object or material can serve as a splint such as sticks, boards, or even rolled up newspapers. If none can be found, use a rolled blanket or clothing. An injured body part can also be taped to an uninjured body part in order to prevent it from moving.
39	How can you appropriately prepare a splint and give an example?	<p>Splint must be well padded on the sides touching the body; if they are not properly padded, they will not fit well and will not adequately immobilize the injured part. Before applying splint open wounds must be covered. We have to immobilize in position found.</p> <p>A basic rule of splinting is that the joint above and below the broken bone should be immobilized to protect the fracture site. For example, if the lower leg is broken, the splint should immobilize both the ankle and the knee.</p>
40	How can you treat a person who is feeling faintish or loss of breath?	<ul style="list-style-type: none"> • If the person feels faint or is breathing in short, rapid breaths, lay the person down with the head slightly lower than the trunk and, if possible, elevate the legs.
41	What is a dislocation and how can it be caused?	A dislocation is an injury in which the ends of bones are forced from their normal positions. The cause is usually trauma resulting from a fall, an auto accident or a collision during contact or high-speed sports.

42	What are the symptoms of dislocation?	Rapid swelling and discoloration, loss of ability to use the joint, severe pain and muscle spasms, possible numbness and loss of pulse below the joint, and shock are characteristic symptoms of dislocations.
43	What is a sprain?	A sprain is a stretching or tearing of ligaments — the tough bands of fibrous tissue that connect one bone to another in your joints.
44	What are common location for a sprain?	The most common location for a sprain is in ankle.
43	What are the following measures that needs to be taken in giving first aid to a victim with joint injury?	<ol style="list-style-type: none"> 1. For dislocations, splint and provide care as you would for fracture. 2. For sprains, use RICE procedure - R=rest, I=Ice, S=compression and E=elevation
44	What are the following measure that needs to be taken in giving first aid to a victim with suspected spinal cord injury?	<ol style="list-style-type: none"> 1. Seek medical assistance immediately. Call for EMS (102) 2. Until EMS arrives: <ul style="list-style-type: none"> • DO NOT move victim unless absolutely necessary to save victim's life. • DO NOT bend or twist victim's neck or body. Careful handling is extremely important. • Maintain position in which victim was found and immobilize head, neck, shoulders, and torso - roll up towels, blankets, jackets, or clothing, and place around head, neck, shoulders, and torso 3. If the person is not breathing or showing signs of circulation, begin CPR but do not lift the chin to open an airway. Instead, you should gently pull the jaw forward 4. If victim must be moved to perform rescue breathing, to clean mouth of vomit or in danger of further injury, enlist help at least one other person to keep victim's head, torso, and legs in straight line as you turn victim.
45	What are burns?	Burns are thermal injury caused by exposure to excess heat.
46	What are the four types of burns?	<ol style="list-style-type: none"> 1. Burns that affect only the superficial skin are known as superficial or first-degree burns. 2. When damage penetrates into some of the underlying layers, it is a partial-thickness or second-degree burn. 3. In a full-thickness or third-degree burn, the injury extends to all layers of the skin. 4. Sometimes we talk about a fourth-degree burns when the injury affects deeper tissues, such as muscle or bone.
47	What are the actions to be taken for a minor burn injury?	<ol style="list-style-type: none"> 1. Cool the burn. <ul style="list-style-type: none"> • Hold the burned area under cool (not cold) running water for 10 or 15 minutes or until the pain subsides. • If this is impractical, immerse the burn in cool water or cool it with cold compresses. • Don't put ice on the burn

		<p>2. Cover the burn with a sterile gauze bandage</p> <ul style="list-style-type: none"> • Wrap the gauze loosely to avoid putting pressure on burned skin. • Bandaging keeps air off the burn, reduces pain and protects blistered skin. <p>3. Take an over-the-counter pain reliever</p> <ul style="list-style-type: none"> • These include aspirin, ibuprofen , naproxen or acetaminophen • Use caution when giving aspirin to children or teenagers. • Talk to your doctor if you have concerns.
48	What are the actions to be taken for a major burn injury?	<p>For major burns, call 112 or emergency medical help. Until an emergency unit arrives, follow these steps:</p> <p>1. Don't remove burned clothing.</p> <ul style="list-style-type: none"> • However, do make sure the victim is no longer in contact with smoldering materials or exposed to smoke or heat. <p>2. Don't immerse large severe burns in cold water</p> <ul style="list-style-type: none"> • Doing so could cause a drop in body temperature (hypothermia) and deterioration of blood pressure and circulation (shock). <p>3. Check for signs of circulation (breathing, coughing or movement).</p> <ul style="list-style-type: none"> • If there is no breathing or other sign of circulation, begin CPR. <p>4. Elevate the burned body part or parts.</p> <ul style="list-style-type: none"> • Raise above heart level, when possible. <p>5. Cover the area of the burn</p> <ul style="list-style-type: none"> • Use a cool, moist, sterile bandage, clean, moist cloth or moist cloth towels
49	What can happen to a person when he/she is in shock and how can you protect a person in shock?	<p>When a person is in shock, his or her organs aren't getting enough blood or oxygen. If untreated, this can lead to permanent organ damage or death. Shock can be a life-threatening problem. The best way to protect people from the serious damages that shock can have on the system is to recognize the symptoms before the person gets into serious trouble.</p>
50	What are common symptoms that can be present in a shocked situation?	<ul style="list-style-type: none"> • Pale, cold, clammy and moist skin • Vacant or dull eyes, dilated pupils • Anxiety, restlessness, and fainting • Weak, rapid, or absent pulse • Nausea and vomiting <p>Etc.</p>
51	How can you monitor a situation while the	They can get the patient to hospital quickly, legally, and more safely.

	ambulance and why should you wait for an ambulance rather than taking the injured or ill person to the hospital yourself?	<ol style="list-style-type: none"> 1. Stay on the line with 911 and follow emergency instructions. 2. Stay calm and try to keep the patient calm. 3. Don't move a patient who was injured in an automobile accident or fall, or who was found unconscious. 4. If the patient is cold, cover them with a blanket. 5. Don't give an injured person anything to eat or drink (unless instructed by the 911 dispatcher). 6. Have someone watch for the ambulance and show the crew how to get to the patient. (This is especially important in an apartment or office building, or if your address is hard to see from the street).
52	Documentation or systemic incident reports related to various incidents occurring while the worker is on duty. What are the following benefits for the team or organization in documentation related issues?	<ol style="list-style-type: none"> 1. Incidents Reports will maintain alertness among all the stakeholders 2. Most incident report forms identify the barriers that prevent adverse situations from developing into a major accident or disaster. Recording of the small to medium events will ensure major stakeholders of the organization is kept alert and hence reduce number of accidents or injuries to guests as well as to the staff of the organization. 3. Lessons learned within the organisation and benchmarks between industries 4. The gathered data can be used for comparisons both within and between organisations and industries. Even though the incident categories and types differ between industries, verticals and even functions, the habit of being aware in the field and documenting the observations is the same. 5. Reporting is cheaper than the costs of a major incident

2.PT=Practical Test

#	Practical Activity	Performance to be evaluated
1	Perform role play of an accident	During the role play, ensure the students perform the following. <ul style="list-style-type: none"> ✓ Assess and evaluate for existing hazards and dangers and try to reduce or manage threats ✓ Assess and evaluate dangers to the person injured ✓ Assess and evaluate dangers to the person attending the injured patient ✓ Monitor the situation carefully
2	Apply basic first aid techniques	As students to perform first aid techniques on the following <ul style="list-style-type: none"> ✓ Relevant first aid techniques for cases of breathing, blood circulation and consciousness ✓ Attend injuries related to <ul style="list-style-type: none"> ▪ Abdominal trauma ▪ Allergic reactions

		<ul style="list-style-type: none"> ▪ Bleeding ▪ Chemical contamination ▪ Choking ▪ Cold injuries ▪ Cardio-vascular failure ▪ Dislocations and fractures ▪ Drowning ▪ Poisoning and toxic substances ▪ Medical conditions including epilepsy, diabetes, asthma ▪ Eye injuries ▪ Head injuries ▪ Minor skin injuries ▪ Neck and spinal injuries ▪ Needle stick injuries ▪ Puncture wounds and cuts ▪ Crush injuries ▪ Shock ▪ Smoke inhalation ▪ Sprains and strains ▪ Substance abuse ▪ Unconsciousness ▪ Infections ▪ Inhalation of toxic fumes and airborne dusts ▪ Bone and joint injuries ▪ Eye injuries ▪ Burns and scalds, thermal, chemical, friction and electrical
3	Prepare required documentation	Students are asked to prepare following documents ✓ Incident reports

3. OW =Observation at work Place

#	Activity to be observed	Assessment and evaluation of the task being performed
1	Observe if student evaluate the situation	During the role play, assess and evaluate how students assess and evaluate the situations. Ensure the way they approach the incident is with care and to see if they take a moment to review existing dangers and evaluate dangers to the patient or to self.
2	Apply basic first aid techniques	Students will be performing various first aid procedures stated above. It is important that the four-step process in providing basic first aid activities. Assess and evaluate competencies of the students in attending relevant first aid activities and interventions performed as part of the assessment.
3	Prepare incident reports	Observe how students approach in making the incident report and assess and evaluate the format and structure of the report and inclusion of the all the relevant data into the report.

4. OQ=Oral Questioning

#	Questions	Answers
1	How to assess and evaluate the situation	Students need to detail steps of assessing and evaluating the situation as soon as they arrive the site of the accident. Such steps need to focus on assessing and evaluating of the surrounding environment, immediate danger to the injured person and to the person attending the site.
2	Explain techniques of providing different first aid techniques	<p>Student need to explain proper procedures and techniques in attending the following first aid procedures.</p> <ul style="list-style-type: none"> ▪ Abdominal trauma ▪ Allergic reactions ▪ Bleeding ▪ Chemical contamination ▪ Choking ▪ Cold injuries ▪ Cardio-vascular failure ▪ Dislocations and fractures ▪ Drowning ▪ Poisoning and toxic substances ▪ Medical conditions including epilepsy, diabetes, asthma ▪ Eye injuries ▪ Head injuries ▪ Minor skin injuries ▪ Neck and spinal injuries ▪ Needle stick injuries ▪ Puncture wounds and cuts ▪ Crush injuries ▪ Shock ▪ Smoke inhalation ▪ Sprains and strains ▪ Substance abuse ▪ Unconsciousness ▪ Infections ▪ Inhalation of toxic fumes and airborne dusts ▪ Bone and joint injuries ▪ Eye injuries ▪ Burns and scalds, thermal, chemical, friction and electrical
3	How to keep monitoring the patient while waiting for the paramedic personnel	Students need to explain how to keep monitoring the patient while waiting for the paramedic personnel or being transported to a health facility.
4	Explain structure and information to be included in the incident report	Students need to explain the structure and the date to be included within the Incident Reports. In particular, make sure the reports are prepare according to relevant standards and will be compliant to standard incident reports.

5. TRB/LB =Trainee’s Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee’s Record/Log Book	As training progresses, students need to be given “Trainee’s Record Book” or “Log Book”. Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, “TR-Trainer Report” or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-7: Respond to Fire

Unit No 07
 Unit Title Respond to Fire
 Unit Code CONCM07V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Prepare for fire							
Procedures related to a fire emergency are accessed, interpreted and rehearsed	✓	✓	✓	✓		✓	✓
Location of firefighting equipment is identified and the equipment is checked in accordance with organizational procedures and referred for maintenance/replacement as required	✓	✓	✓		✓	✓	✓
2. Carry out initial notification and assessment							
Nature and scope of the fire is identified, confirmed and reported to appropriate personnel	✓	✓	✓	✓		✓	✓
Fire situation is assessed and appropriate course of action is determined in keeping with requirements for personal safety	✓	✓	✓		✓	✓	✓
Notification of fire threat is undertaken in accordance with authorized procedures	✓	✓		✓	✓	✓	
Emergency evacuation procedures are followed, where appropriate, and in accordance with organizational procedures	✓	✓	✓	✓		✓	✓
3. Extinguish fires							
Fires are extinguished using the appropriate equipment, materials and procedures	✓	✓	✓	✓		✓	✓
Extinguisher is applied to ensure fast knockdown of fire	✓	✓	✓		✓	✓	✓
Extinguisher is used at the appropriate range and time	✓	✓		✓	✓	✓	
Extinguisher is used to minimize damage to equipment and facilities and to minimize risk of injury to personnel	✓	✓	✓	✓		✓	✓

Note:

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play

1. Written questions

#	Question	Answer
1	What is fire?	Fire is very rapid oxidation. Rusting iron and rotting wood are common examples of slow oxidation. Fire, or combustion, is rapid oxidation as the burning substance combines with oxygen at a very high rate.
2	What are common causes of workplace fires?	<ul style="list-style-type: none"> • Faulty Electrics • Flammable or combustible materials • Human Error • Negligence • Arson
3	Explain 2 common causes of workplace fires?	<ol style="list-style-type: none"> 1. Faulty Electrics are a very common cause of workplace fires and include loose wires and antiquated or faulty equipment. Every employer needs to ensure that fixed electrical equipment is maintained on a regular basis. 2. Flammable or combustible materials represent a danger to your staff and your business. Every company should prioritize fire safety when undertaking risk assessments, and this is crucial in premises that hold any flammable or combustible materials or substances that must be stored appropriately stored and disposed of correctly. All staff should attend a fire safety training course to ensure correct procedure.
4	What are the three things that are needed for combustion to take place?	<ul style="list-style-type: none"> • fuel (to vaporize and burn) • oxygen (to combine with fuel vapour) • heat (to raise the temperature of the fuel vapour to its ignition temperature).
5	What are the five classes of fire?	<p>Classes of fire Combustible and flammable fuels have been broken down into five categories:</p> <ul style="list-style-type: none"> • Class A fires are those involving organic solids such as paper or wood • Class B fires are those involving flammable liquids • Class C fires are those involving flammable gases • Class D fires are those involving metals • Class F fires are those involving cooking oils
6	What are activities that need to be continuously performed in preventing fires from occurring?	<ol style="list-style-type: none"> 1. Risk assessment 2. Fire prevention 3. Undertake regular fire risk assessment 4. Follow fire precautions at all times 5. Evaluate and ensure means of escape 6. Undertake regular fire emergency planning 7. Undertake regular training and sharing of information

		8. Maintain record keeping or log books
7	Explain how risk assessment can be take in prevention of fire.	The first step in fire prevention is to assess the risks and record them in a risk register. This requires reviewing and assessing the means by which a fire might start and spread, the potential consequences and the available approaches to mitigate the risk. This includes assessing day-to-day operations, risks associated with periodic building and maintenance work and those arising from installing new equipment, or adopting new or changing technologies.
8	Explain how to undertake regular fire risk assessment.	The responsible person must ensure that a suitable and sufficient fire risk assessment of the premises is completed and reviewed on a regular basis. A fire risk assessment is an organised and methodical look at the premises, the activities carried on there and the likelihood that a fire could start and cause harm to those in and around the premises. There is no set format or approach but a template is provided that may assist establishments in completing a fire risk assessment.
9	Explain the following of fire precaution at all times briefly.	In the event of a fire occurring, there should be suitable measures in place to detect a fire, give warning of fire and that mitigate the spread of smoke and fire. <ul style="list-style-type: none"> • Fire detection and warning systems should be installed • Emergency lighting should be installed • Firefighting equipment (fire extinguishers) should be installed • Fire signs, notices and plans should be fitted • Fire doors should be fitted in accordance with good practice and well maintained
10	Explain how to evaluate and ensure means of escape.	The ability of the occupants of a building to evacuate in the case of fire is a fundamental aspect of fire safety. In the case of a fire, or indeed any other emergency, people should be able to turn away from the hazard and escape to the open air or other place of safety. Escape routes should be inspected regularly to check they are not obstructed and that fire exit doors are unlocked.
11	Explain how to undertake fire emergency planning.	When a fire situation is detected, it is vital that establishments have in place appropriate procedures. All establishments need to prepare a fire emergency plan under the guidance of experts. It is vital that the emergency plan is tested so as to ensure that all staff are aware of the procedures to be followed in the event of a fire. This can be achieved by undertaking a desk-top exercise and also by completing regular fire drills (at least once every half-term).
12	How can you maintain record keeping or log books?	To prepare well, it is important that appropriate records are kept in a specified log book or file and the records need to be checked for accuracy. In particular, the log book need to include the following. <ul style="list-style-type: none"> • Details of any significant findings from the fire risk assessment and any action taken

		<ul style="list-style-type: none"> • Testing and checking of escape routes, including final exit locking mechanisms, such as panic devices, emergency exit devices and any electromagnetic devices; • Testing of fire-warning systems, including weekly alarm tests and periodic maintenance by a competent person; recording of false alarms; • Testing and maintenance of emergency lighting systems; • Testing and maintenance of fire extinguishers, hose reels and fire blankets • Recording and training of relevant people and fire evacuation drills; • Maintenance and audit of any systems that are provided to help the fire and rescue service • The fire emergency plan
12	What continuous assessment and maintenance regulatory requirements and good practices?	<ol style="list-style-type: none"> 1. Portable Fire Fighting Equipment: All portable firefighting equipment has to be checked by a competent person on an annual basis (e.g. extinguishers, fire blankets and hoses). 2. Fire Detection and Warning Systems (alarms): Fire alarm tests need to be carried out in accordance with requirements. This requires weekly tests of the audible fire alarm system, quarterly and annual tests of all devices such as heat and smoke detectors, call points and sounders should also be carried out by a competent contractor. 3. Emergency Lighting: Emergency lighting should be tested by facility maintenance team on a regular basis to ensure the workplace is lit during emergency situations such as fire. 4. Evacuation Paths: Every workplace needs to have proper pathways worked out and displayed to the staff in the event of fire. Referred pathways and doors and need to be checked on regular basis to prevent fatalities and reduce damage to the staff in case of fire.
13	What are the portable fire-fighting equipment?	Normally available fire-fighting equipment includes portable appliances such as extinguishers, buckets of sand or water and fire-resistant blankets. In larger premises you will find automatic sprinklers, hose reels and hydrant systems.
14	What are the main five types of fire extinguishers?	Water, Foam, Dry Powder, CO2 and Wet Chemical.
15	How can you follow the procedure of extinguishing fire using the (PASS)? Explain each step of them briefly.	<ul style="list-style-type: none"> • Pull the safety pin, this will allow you to discharge the extinguisher. • Aim the extinguisher the base of the fire, this will allow you to hit the fuel. • S- Squeeze the top handle or lever, this will release the pressurized extinguishing agent.

		<ul style="list-style-type: none"> • S- Sweep the extinguisher hose from side to side until the fire is completely out. <p>Wait and carefully check that the fire is out and has not reignited. If it has reignited, spray again – but remember that a typical fire extinguisher usually provides only 60 seconds of extinguishing power.</p>
16	What are the regular inspection that are required to follow while extinguishing fire?	<ul style="list-style-type: none"> • Fire extinguishers should be mounted on the wall to prevent being damaged. • The area in front of the extinguisher shall be kept clear at all times. • The pressure gauge should be in the green zone at all times. • Fire extinguishers should be inspected on a monthly basis. • Know the location of all fire extinguishers in your facility.
17	Mention few protective equipment used.	<ol style="list-style-type: none"> 1. Bunker gear 2. Fire Helmet 3. Protective hoods 4. Boots and gloves <p>Etc.</p>
18	Why is an emergency evacuation procedure or plan important?	<p>Fire represents one of the biggest workplace safety threats and can result in serious injuries or even fatalities. Workplace fires can also cause extensive property damage, and can render the worksite either destroyed or out of service indefinitely. For these reasons, an effective workplace fire evacuation plan is important.</p>
19	What are basic fire safety you must need to know for every worksite?	<ul style="list-style-type: none"> • Know the location of the fire extinguishers in the workplace. You should be aware where the nearest extinguisher is at all times • Know where your nearest emergency exits are • Know the difference between alarm signals to quickly recognize the situation
20	What should do when you discover a fire?	<ul style="list-style-type: none"> • Alert all other individuals within the workplace by activating the nearest fire alarm, shouting clearly or by using other procedures set in place by your company • Use the nearest exit to evacuate the workplace • Use a fire extinguisher to put the fire out. Be careful while doing this and do not attempt if yours or other safety is at risk or on large fires
21	What should be done during evacuation at a worksite?	<ul style="list-style-type: none"> • Stay calm and evacuate the building immediately when you hear the fire alarm. • Along the escape route, close (don't lock) all the doors and windows you pass by so that you can cut the fire and smoke off from spreading to the other rooms • Go to the assembly point and alert your relevant supervisors that you are safe and outside the building

		<ul style="list-style-type: none"> Adhere to any protocols put in place by your company
22	What are the essential fire evacuation steps to be taken by every team, or company?	<ul style="list-style-type: none"> Know the location of the fire extinguishers in the workplace. Every worker must be aware where the nearest extinguisher is at all times. Know where your nearest emergency exits are. Know the difference between alarm signals to quickly recognize the situation. Knowing all of these can make all the difference in saving lives and preventing unnecessary damage.
23	How and where can standard/multi-purpose dry powder be used along with the risk or danger of this extinguisher?	<p>Application: The powder ‘knocks down’ the flames. Safe to use on most kinds of fire. Multi-purpose powders are more effective, especially on burning solids; standard powders work well only on burning liquids.</p> <p>How to use: Aim the jet at the base of the flames and briskly sweep it from side to side.</p> <p>Dangers: The powder does not cool the fire well. Fires that seem to be out can re-ignite. Doesn’t penetrate small spaces, like those inside burning equipment. The jet could spread burning fat or oil around.</p>
24	How and where can Water be used along with the risk or danger of this extinguisher?	<p>Application: The water cools the burning material. You can only use water on solids, like wood or paper. Never use water on electrical fires or burning fat or oil.</p> <p>How to use: Aim the jet at the base of the flames and move it over the area of the fire.</p> <p>Dangers: The water can conduct electricity back to you. Water actually makes fat or oil fires worse – they can explode as the water hits them.</p>
25	How and where can CO ₂ be used along with the risk or danger of this extinguisher?	<p>Application: Displace oxygen with CO₂ (a non-flammable gas). Good for electrical fires as they don’t leave a residue.</p> <p>How to use: Aim the jet at the base of the flames and sweep it from side to side.</p> <p>Dangers: Pressurized CO₂ is extremely cold. DO NOT TOUCH. Do not use in confined spaces.</p>
26	How and where can Foam/AFFF be used along with the risk or danger of this extinguisher?	<p>Application: The foam forms a blanket or film on the surface of a burning liquid. Conventional foam works well only on some liquids, so it’s not good for use at home, but AFFF is very effective on most fires except electrical and chip-pan fires.</p> <p>How to use: For solids, aim the jet at the base of the flames and move it over the area of the fire. For liquids, don’t aim the foam straight at the fire – aim it at a vertical surface or, if the fire is in a container, at the inside edge of the container.</p> <p>Dangers: ‘Jet’ foam can conduct electricity back to you, though ‘spray’ foam is much less likely to do so. The foam could spread burning fat or oil around.</p>
27	There are many fire extinguishers that can be used for different purposes. In order to identify the types of	<p>Standard/Multi-purpose dry powder: Blue</p> <p>Water: Red</p> <p>CO₂: Black</p> <p>Foam/AFFF (Aqueous Film Forming Foam): White or cream</p>

	extinguisher it is, there are colours given for it. Distinguish the different types of extinguishes by giving its respective colours.	
28	What are the points to consider when using a fire extinguisher?	<ul style="list-style-type: none"> • never use a fire extinguisher unless you have been trained to do so • do not use water extinguishers on electrical fires due to the risk of electric shock and explosion • do not use water extinguishers on oils and fats as this too can cause an explosion • do not touch the horn on CO2 extinguishers as this can freeze burn the hands • do not use the CO2 extinguisher in a small room as this could cause suffocation • Read the operating instructions on the extinguisher.

2.PT=Practical Test

#	Practical Activity	Assess and evaluate performance of the student
1	Carry out steps involved in undertaking preparations needed to fight fires	<p>Students will be assessed while performing the practical that involved carrying out preparatory steps related to undertaking preparations to fight fires. Make sure the students perform preparation steps in sequence and follow the standard procedures of preparations required. Some of these include but not limited are as follows.</p> <ul style="list-style-type: none"> ✓ identify emergency alarms and match with response requirement ✓ apply evacuation procedures ✓ assess fire situation and notify authorities ✓ identify, select and use firefighting equipment
2	Simulate incidents of reporting fires	Carry out a role play activity where students will be taking reports of a fire. Make sure they ask the right questions and gather all the relevant information and data while documenting a fire incident.
3	Extinguish simple fires	<p>Students should demonstrate the following competencies</p> <ol style="list-style-type: none"> 1. Use the following accessories related to fire fighting <ul style="list-style-type: none"> ✓ Extinguishers ✓ Fire blankets ✓ Fire hose reels ✓ Fire hydrants ✓ Firefighting vehicles ✓ Personal protection equipment (PPE) 2. Inspect and manage fire alarms 3. Inspect serviceability of fire extinguishers

		4. Extinguish fires of different class using relevant firefighting procedures
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3. OW=Observation at work Place

#	Activity to be observed	Assess and evaluate performance of the activities
1	Carry out steps involved in undertaking preparations needed to fight fires	<p>Make sure students undertake preparation steps in correct sequence and complete the following.</p> <ul style="list-style-type: none"> ✓ identify emergency alarms and match with response requirement ✓ apply evacuation procedures ✓ assess fire situation and notify authorities ✓ identify, select and use firefighting equipment such as extinguishers, fire blankets, fire hose reels, fire hydrants, firefighting vehicles and use of personal protective equipment (PPE)
2	Simulate incidents of reporting fires	Make sure the students capture all the relevant technical information and data about the ongoing fire and while taking report of fire incidents being reported .
3	Extinguish simple fires	<p>While extinguishing fire students should demonstrate competencies related to the use of fire extinguishers, fire blankets, fire hose reels, fire hydrants, firefighting vehicles, personal protection equipment (PPE).</p> <p>Students should also have relevant knowledge and skills to inspect and manage fire alarms</p> <p>Inspect and service fire extinguishers and constantly inspect and service them accordingly</p> <p>Attend live fire simulations and extinguish fires of different class using relevant firefighting procedures</p>

4. OQ=Oral Questioning

#	Questions	Answers
1	What activities need to be performed in preparation for extinguishing fire	<p>Students need to detail different preparatory procedures that includes uses of the firefighting equipment and they are as follows.</p> <ul style="list-style-type: none"> ✓ emergency alarms and response requirement ✓ evacuation procedures ✓ how notify authorities ✓ use firefighting equipment such as extinguishers, fire blankets, fire hose reels, fire hydrants, firefighting vehicles and use of personal protective equipment (PPE)
2	How to carry out initial notification and assessment	Make sure the students capture all the relevant technical information and data about the ongoing fire and while taking report of fire incidents being reported.

3	Explain steps involved in extinguishing fire	<p>Students should demonstrate competencies related to the use of fire extinguishers, fire blankets, fire hose reels, fire hydrants, firefighting vehicles, personal protection equipment (PPE).</p> <p>Students should explain knowledge and skills to inspect and manage fire alarms</p> <p>Students should explain to inspect and service fire extinguishers and constantly inspect and service them accordingly</p> <p>Should explain procedures related to fire.</p>
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5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Other Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-8: Apply Science and Engineering Measurements

Unit No	08
Unit Title	Apply Science and Engineering Measurements
Unit Code	CONS08CR01V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Apply basic mathematics							
Perform simple calculations on: fractions and decimals, calculations to a number of significant figures, decimal places	✓		✓	✓	✓		✓
Identify and use the multiples and sub-multiples of units	✓	✓		✓		✓	✓
Perform calculations on: perimeter and area of plane figures (i.e. square and rectangle, triangle, circle), volume and surface area (i.e. cube, rectangular prism, cylinder), mass of containers and their contents (i.e. cube, rectangular prism, cylinder)	✓		✓	✓	✓		✓
Perform mathematical calculations involving formulas, angles, triangles and geometric construction	✓	✓		✓		✓	✓
Identify and use formulas for SI quantities: length, area, volume, mass, density	✓		✓	✓	✓		✓
Identify the elements of a circle Parts: radius, diameter, circumference, chord, sector, segment, arc, tangent	✓	✓		✓		✓	✓
Identify and use the ratio of sides of 45° and 60° right angled triangles	✓		✓	✓	✓		✓
Identify and use the rules of 3:4:5 and 5:12:13 for the sides of right-angled triangles	✓	✓		✓		✓	✓
Solve simple workshop problems involving Pythagoras and right-angled triangles	✓		✓	✓	✓		✓
Evaluate and transpose simple formulae associated with workshop problems	✓	✓		✓		✓	✓
Convert minutes and seconds to decimal fractions of a degree	✓		✓	✓	✓		✓
2. Apply Fundamental of Science							
Systems of measurements, Motion in one dimension and two dimensions	✓		✓	✓	✓		✓

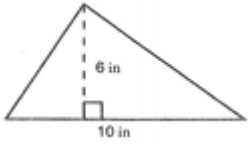
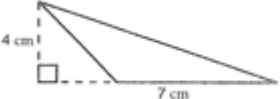
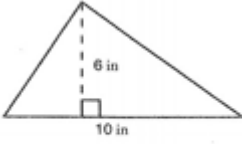
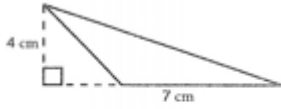
Newton's Laws I & II	✓	✓		✓		✓	✓
Gravity	✓		✓	✓	✓		✓
Mechanics of solids and fluids	✓	✓		✓		✓	✓
3. Demonstrate simple drawing							
Identify angles, plane figures and types of drawing	✓		✓	✓	✓		✓
Identify first and third angle orthographic projections of isometric or oblique views	✓	✓		✓		✓	✓
Identify single plane sectional views of simple components	✓		✓	✓	✓		✓
Perform basic drafting	✓	✓		✓		✓	✓
Read and interpret drawings	✓		✓	✓	✓		✓
Introduce basics of AUTOCAD	✓	✓		✓		✓	✓
4. Undertake relevant measurement							
Identify measuring devices	✓		✓	✓	✓		✓
Follow appropriate measuring procedures	✓	✓		✓		✓	✓
Keep record of the measurements	✓		✓	✓	✓		✓

Note:

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies, FB= Feedback from Fellow Members and RP= Role Play

1. Written questions

#	Question	Answer
1	Define fractions.	A number that represents part of a whole.
2	What are the two types of fractions?	✓ Common fraction ✓ Decimal fraction
3	What are decimal fractions?	Decimal fractions are similar to common fractions in that they describe part of a whole object.
4	What fractions do welders primarily work with and why?	Decimal fractions, because they have to work with tenths and hundredths.
5	List the units used for the following physic quantities: a. Area b. Volume c. Velocity d. Density e. Acceleration f. Density g. Pressure	✓ Area: m ² ✓ Volume: m ³ ✓ Velocity: m s ⁻¹ ✓ Density: m s ⁻² ✓ Acceleration: ✓ Density: kg m ⁻³ ✓ Pressure: N m ⁻² or Pa
6	Define perimeter.	The distance around a figure.
7	What two figures have all angles which are 90°?	✓ Square ✓ Rectangle
8	Find the area for the following:	✓ 36km ² ✓ 144cm ²

	a. Square (6km) b. Square (12cm) c. Rectangle (6cm by 8cm) d. Rectangle (4m by 2m)	✓ 48cm^2 ✓ 8m^2
9	How do you find the area of a triangle?	✓ $\frac{1}{2} \times \text{breadth} \times \text{height}$
10	Find the area of the following: a.  b. 	✓  $A = \frac{1}{2}bh$ $A = \frac{1}{2}(10)(6)$ $A = 30\text{ in}^2$ ✓  $A = \frac{1}{2}bh$ $A = \frac{1}{2}(7)(4)$ $A = 14\text{ cm}^2$
11	How do you find the volume is a prism?	Cross-sectional area \times length
12	How do you find the volume of a cylinder?	$\pi r^2 h$ (Where r is the radius and h is the height of the cylinder)
13	A cylinder has a volume of 965 cm^3 . If the height of the cylinder is 16 cm, find the radius. Give your answer to 2 significant figures.	Substitute the information from the question into the formula for the volume of a cylinder: Volume of cylinder = $\pi r^2 h$ $965 = \pi \times r^2 \times 16$ $965 = \pi \times 16 \times r^2$ $965 = 50.26548 \times r^2$ $19.198 = r^2$ $4.38156 = r$ So the radius of the cylinder is 4.4 cm (to 2 SF)
14	Define constant velocity.	Motion that does not change in speed nor direction.
15	Is constant velocity positive or negative?	Both.
16	What are the two conditions that must be met for an object to be moving with constant velocity?	✓ Must have constant speed ✓ Must be moving in a constant direction
17	What does Newton's Second Law state in terms of velocity?	Newton's second law ($F=ma$) suggests that when a force is applied to an object, the object would experience acceleration. If the acceleration is 0, the object shouldn't have any external forces applied on it. Mathematically, this can be shown as the following: $a = \frac{dv}{dt} = 0 \Rightarrow v = \text{const.}$
18	How do you calculate an object's velocity?	Given a graph as in, we can calculate the velocity from the change in distance over the change in time.

19	Define projectile motion.	Projectile motion is the motion of an object thrown, or projected, into the air, subject only to the force of gravity.
20	What are the two types of plumbing sketches?	<ul style="list-style-type: none"> ✓ Orthographic ✓ Isometric
21	Briefly explain orthographic sketching.	<p>Orthographic sketching is best described as a two dimensional drawing shown from a vantage point. Building plans for example are illustrated as if someone was looking down on them(top view), this is called a plan view and best describes horizontal features; such as underground piping for example.</p> <p>Another common orthographic view is a front view; also called an elevation view. An elevation view is from the perspective of a person standing in front of a structure and best describes vertical features; such as a plumbing stack.</p>
22	Briefly explain isometric sketching.	<p>An isometric sketch is a two dimensional drawing that creates the illusion of three dimensions using angular lines. This is the preferred drawing method for plumbers as it shows the most information about the piping layout. Although an isometric drawing is the most complex to draw, it has definite advantages; such as showing both horizontal and vertical piping on a single drawing. Making an isometric sketch is accomplished by imagining yourself at the lowest point (downstream) in a plumbing system and drawing it as you would see it; if it was laid out from lower left to upper right.</p>
23	Briefly explain a disadvantage of isometric sketches.	<p>The one problem with an isometric sketch arises when pipes are on angles other than horizontal or vertical; such as 45-degree fittings. These "odd" angles are drawn as they would appear using 60 degree angles. When trying to draw circles in isometric drawings you will have to use an ellipse.</p>
24	How do you find the circumference of a circle?	To know the circumference of a circle, multiply its diameter by 3.1416.
25	How do you find the area of a circle?	To calculate the area of circle, multiply the square of the diameter by 0.7854.
26	How do you calculate the side of a hexagon inside a circle?	To calculate the side of a hexagon inside in a circle, multiply the diameter of the circle by 0.500.
27	How do you calculate the side of an equilateral triangle inside in a circle?	To calculate the side of an equilateral triangle inside in a circle, multiply the diameter of a circle by 0.866.
28	How do you calculate the volume of a ball (sphere)?	To calculate the volume of a ball (sphere), multiply the cube of the diameter by 0.5236.
29	List 5 commonly used measuring tools.	<ul style="list-style-type: none"> ✓ Steel ruler ✓ Caliper ✓ Screw gauge (micrometer) ✓ Measuring tape ✓ Pressure gauge
30	What is the Vernier caliper used to measure?	The meter scale is used to measure the length to the nearest millimeter only. For measuring smaller lengths precisely, Vernier caliper is used. It is a precision

		instrument used to measure the internal and external lengths.
31	Identify 5 plumbing symbols with illustrations.	

2.PT=Practical Test

#	Practical Activity	Assess and evaluate performance of the student
1	Student Assignments	Students need to undertake assignments related to applying science and engineering measurements, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas. <ul style="list-style-type: none"> ✓ Apply basic mathematics ✓ Apply Fundamental of Science ✓ Undertake relevant measurement
3	Review Assessment papers	Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following. <ul style="list-style-type: none"> ✓ Apply basic mathematics ✓ Apply Fundamental of Science ✓ Undertake relevant measurement
4	Demonstrate how to measure using a pressure gauge	The student is expected to follow the correct step-by step process to measuring with a pressure gauge. The elements which should be assessed are:

		<ul style="list-style-type: none"> ✓ used to take external measures of objects outside jaws ✓ used to take internal measures of objects inside jaws ✓ used to measure the depth of objects depth probe
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3. OW=Observation at work Place

#	Activity to be observed	Assess and evaluate performance of the activities
1	Assessment papers	<p>While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.</p> <ul style="list-style-type: none"> ✓ Apply basic mathematics ✓ Apply Fundamental of Science ✓ Undertake relevant measurement
2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to managing the day-to-day running of science teaching laboratories and the preparation of practical experiments, demonstrations also determining simple drawings.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Demonstrate how to use Vernier caliper	As the students attend the practical test to check their knowledge about Vernier calipers, make sure the student use the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Answers
1	Apply basic mathematics	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Perform simple calculations on: fractions and decimals, calculations to a number of significant figures, decimal places ✓ Identify and use the multiples and sub-multiples of units ✓ Perform calculations on: perimeter and area of plane figures (i.e. square and rectangle, triangle, circle), volume and surface area (i.e. cube, rectangular prism, cylinder), mass of containers and their contents (i.e. cube, rectangular prism, cylinder)

		<ul style="list-style-type: none"> ✓ Perform mathematical calculations involving formulas, angles, triangles and geometric construction ✓ Identify and use formulas for SI quantities: length, area, volume, mass, density ✓ Identify the elements of a circle Parts: radius, diameter, circumference, chord, sector, segment, arc, tangent ✓ Identify and use the ratio of sides of 45° and 60° right angled triangles. ✓ Identify and use the rules of 3:4:5 and 5:12:13 for the sides of right-angled triangles. ✓ Solve simple workshop problems involving Pythagoras and right-angled triangles. ✓ Evaluate and transpose simple formulae associated with workshop problems. ✓ Convert minutes and seconds to decimal fractions of a degree.
2	Apply Fundamental of Science	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Systems of measurements, Motion in one dimension and two dimensions ✓ Newton's Laws I & II ✓ Gravity ✓ Mechanics of solids and fluids
3	Demonstrate simple drawing	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Identify angles, plane figures and types of drawing ✓ Identify first and third angle orthographic projections of isometric or oblique views. ✓ Identify single plane sectional views of simple components. ✓ Perform basic drafting ✓ Read and interpret drawings ✓ Introduce basics of AUTOCAD
4	Undertake relevant measurement	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Identify measuring devices ✓ Follow appropriate measuring procedures ✓ Keep record of the measurements

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.

2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-9: Perform safe workshop practice

Unit No 09
 Unit Title Perform safe workshop practice
 Unit Code CONS08CR04V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Identify and explain functions tools used in mechanical workshop							
Sketch and name tools used in the mechanical workshop	✓	✓		✓	✓	✓	
Explain functions of the identified tools and scope of their use	✓		✓	✓	✓		✓
2. Identify and explain properties of various pipes and their applications							
Identify types of pipes used in plumbing and sewerage services	✓	✓		✓	✓	✓	
Interpret functions and their application within plumbing services and sewerage operations	✓		✓	✓	✓		✓
Demonstrate joining methods of the pipes	✓	✓		✓	✓	✓	
Familiarize with fitting used on these different pipes	✓		✓	✓	✓		✓
3. Use measuring instruments properly							
Identify names and functions of various measuring instruments used in mechanical workshop	✓	✓		✓	✓	✓	
Demonstrate use of various measuring instruments	✓		✓	✓	✓		✓
4. Apply safe electrical skills							
Interpret electrical safety	✓	✓		✓	✓	✓	
Familiarize with functions and applications of electrical tools and equipment	✓		✓	✓	✓		✓
Perform simple electrical circuits	✓	✓		✓	✓	✓	
Perform electrical measurements using measuring devices on single phase and three phase equipment	✓		✓	✓	✓		✓
Diagnose faults on electrical connections on electrically operated appliances	✓	✓		✓	✓	✓	
5. Perform basic workshop practices							
Undertake marking out on pipe	✓	✓		✓	✓	✓	

Perform pipe cutting methods	✓		✓	✓	✓		✓
Perform drilling holes on pipes	✓	✓		✓	✓	✓	
Perform filing on pipes	✓		✓	✓	✓		✓

Note:

✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies, FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

#	Question	Answer
1	Identify 5 types of equipment used in mechanical workshops.	<ul style="list-style-type: none"> ✓ Air Nozzles & Air Chucks ✓ Hammers ✓ Hand Sanding Blocks ✓ Pliers, Snips, & Vice Grips ✓ Ratchets ✓ Safety Items ✓ Scrapers & Chisels ✓ Screwdrivers ✓ Sockets ✓ Tool Box ✓ Wrenches
2	What are air nozzles used for?	Air nozzles are used to blow loose contaminants from working surfaces. Air pressures can be adjusted at the regulator on the wall or by installing a cheater valve on the inlet side of the nozzle.
3	What are ball peen hammers used for?	They are used to move thick plate etc.
4	Why are ball peen hammers not used on sheet metal?	Ball Peen hammers are heavy and have a lot of mass. They are never used on sheet metal; it would create more damage to the surface.
5	What are ratchets used for?	Ratchets are used in conjunction with sockets as a twisting device to tighten or loosen bolts and nuts.
6	What are wide face chisels used for?	Wide face chisels are used to reshape body contours, and bodylines that have been altered after a collision. They are used in conjunction with sledgehammers.
7	List three types of wrenches.	<ul style="list-style-type: none"> ✓ Combination Wrench ✓ Open End Angle Wrench ✓ Adjustable/Crescent Wrench ✓ Pipe Wrench
8	What are open end angle wrenches used for?	The angle to this wrench allows access to hard to reach bolts and nuts.
9	What are pipe wrenches used for?	Pipe wrenches are used on pipes and other round objects that need to be tightened or loosened.

10	Identify 5 of the most common plumbing pipe materials.	<ul style="list-style-type: none"> ✓ copper, ✓ galvanized steel, ✓ polyvinyl chloride (PVC), ✓ chlorinated polyvinyl chloride (CPVC) ✓ cross-linked polyethylene (PEX).
11	What are the two types of copper pipes used to outfit a plumbing system?	<ul style="list-style-type: none"> ✓ Rigid Copper ✓ Flexible Copper Tubing
12	Briefly explain rigid copper.	The material can be cut into pieces and then soldered together. tight and flexibility is needed, such as in corners or in a supply line to your faucet.
13	Briefly explain flexible copper tubing.	Flexible, or soft, copper is malleable and is used in short runs where space is.
14	What are the three grades of thickness of copper pipes.	<ul style="list-style-type: none"> ✓ Type M ✓ Type L ✓ Type K
15	Briefly explain the three grades of thickness of copper pipes.	<ul style="list-style-type: none"> ✓ Type M: This type is the thinnest copper used in plumbing. It can usually be used for water piping, but it is more often used for drain, waste and vent (DWV) piping. This type works well for hot and cold supply lines in the home. ✓ Type L: This medium thickness tends to be the type of choice for transporting drinking water. As with Type M, this type works well for interior hot and cold supply lines. ✓ Type K: This type has the thickest walls, making it ideal for harsh conditions. Unlike Types M and L, Type K is the ideal choice for underground service lines.
16	Explain three advantages of copper pipes.	<ul style="list-style-type: none"> ✓ Longevity: Copper has proven to be a reliable material that can last at least 50 years. ✓ Durability: Copper is a sturdy material that is not prone to leakage or corrosion. ✓ Safety: Bacteria cannot thrive in copper pipes, and copper will not pollute water in any way, so it is safe to transport drinking water. ✓ Recyclability: When copper pipes eventually need to be replaced, the material can be recycled. ✓ Temperature Tolerance: Copper is able to stand up to extreme temperature changes, including hot and cold water.
17	Explain two disadvantages of copper pipes.	<ul style="list-style-type: none"> ✓ Financial Cost: The main deterrent to using copper is the cost. The value of copper as a global commodity has gone up in recent years, so today, it will cost you approximately \$285 for 100 feet of piping. ✓ Environmental Cost: Environmentally-conscious homeowners may be concerned about the fact that copper mining and manufacturing take a toll on the environment.

		So, although copper pipes last a long time and can be recycled, they are not considered a "green" product.
18	Explain three disadvantages of galvanized steel pipes.	<ul style="list-style-type: none"> ✓ Short Lifespan: Galvanized steel pipes last about 20 to 50 years before they begin to break down. This lifespan may not seem too short, but it pales in comparison to the lifespans of many other piping materials. ✓ Rust: Especially in pipes with a small diameter, rust can build up inside over time. In some cases, the rust can break loose from the inside walls of the pipe and end up mixing with the water as it flows through. This discolors the water. ✓ Lead Contamination: If pipes become corroded, lead can leach into the water inside, making it unsafe to drink. ✓ Clogs: Over time, mineral build-up inside of galvanized pipes can begin to form clogs that block water flow. ✓ Weight: The downside to these pipes being very sturdy is that they are also extremely heavy. This makes them difficult to work with. ✓ Vulnerability: When galvanized pipes are damaged, the galvanization on the outside is compromised, which makes the pipe vulnerable to corrosion in a short amount of time.
19	What material is polyvinyl chloride pipes made of?	Thermoplastic polymer.
20	What are polyvinyl chloride pipes most often used for?	They are used most often for highly pressurized water, such as in a home's main water supply line. PVC pipes work in a variety of applications, including for transporting potable water and for draining.
21	Explain three advantages of polyvinyl chloride pipes.	<ul style="list-style-type: none"> ✓ Longevity: PVC is not subject to rust or corrosion, so unless it experiences some sort of unexpected damage, it can last indefinitely. Even the most durable metals used in plumbing pipes cannot live up to the impressive lifespan of PVC. ✓ Ability to Handle Pressure: PVC is often used for the main supply line that goes into your home because it is able to handle high water pressure. ✓ Ease of Use: PVC is extremely light compared to metal pipes, which makes it easy to transport and to work with. It is also easy to work with because there is no soldering required to connect pipes. Instead, pipes are essentially glued together. ✓ Low Cost: PVC is low in cost as well. Especially compared to copper, PVC is a very inexpensive option for plumbing pipes.
22	Explain two disadvantages of polyvinyl chloride pipes.	<ul style="list-style-type: none"> ✓ Susceptibility to Warping: PVC is not equipped to transport hot water. This is because, like most plastics, heat can cause the material to warp and melt. ✓ Size: Sizing options for PVC pipes are limited, which can be an issue at times. Even if your PVC piping is the perfect size, fittings used to connect PVC pipes can tend to be bulky, which can be problematic in tight spaces.

23	Explain three advantages of chlorinated polyvinyl chloride pipes.	<ul style="list-style-type: none"> ✓ Longevity: Like PVC, since CPVC is a plastic material, it does not react to corrosive substances and does not rust, so its lifespan is indefinite. ✓ Ability to Handle Pressure: CPVC shares PVC's ability to handle high water pressure, making it a good material for a main water supply line. ✓ Ease of Use: CPVC is also quite lightweight, which makes it easy to move and work with. CPVC is also somewhat flexible. ✓ Low Cost: Though CPVC costs more than PVC, it is still a budget option compared to metal piping materials. ✓ Temperature Tolerance: CPVC is able to withstand extreme temperatures up to 200 degrees Fahrenheit. This equips CPVC to handle hot water transport.
24	Why are cross-linked polyethylene pipes popular?	<ul style="list-style-type: none"> ✓ The major difference between PVC and PEX is that PEX pipes are flexible. This means they can be used in long, continuous runs. ✓ In addition to being flexible, PEX is easy to cut and join together. The PEX system is designed to fit together with the combination of barbed fittings and crimping rings or cinch clamps. This method of joining pipes is in lieu of any soldering or gluing. The installation process is quick and easy, and the material is made to last. PEX piping can come coiled up in a flexible roll, wrapped in aluminum to keep its shape or in hard lengths.
25	Identify three types of pipes.	<ul style="list-style-type: none"> ✓ Stainless steel pipes ✓ Cast iron pipes ✓ Polybutylene pipes ✓ High-density polybutylene pipes ✓ Black iron pipes
26	Identify four types of jointing techniques in welding.	<ul style="list-style-type: none"> ✓ Soldering ✓ Bronze welding ✓ Compression joints ✓ Flange joints
27	What are three materials used for pipe and tube?	<ul style="list-style-type: none"> ✓ Carbon steel ✓ Stainless steel ✓ Copper ✓ Plastic piping ✓ Glass and ceramic piping
28	What are the two types of soldering joints?	<ul style="list-style-type: none"> ✓ Hard soldering ✓ Soft soldering
29	Define hard soldering.	Hard Soldering is also known as silver soldering or cupro-techtic welding
30	Define soft soldering.	Soft soldering is a means of jointing pipe using traditional plumbers solder which is a mixture of tin and lead

2.PT=Practical Test

#	Activity to be performed	Activity to be evaluated and assessed
1	Student Assignments	Students need to undertake assignments related to performing safe workshop practices, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas. <ul style="list-style-type: none"> ✓ Identify and explain functions tools used in mechanical workshop ✓ Identify and explain properties of various pipes and their applications ✓ Use measuring instruments properly ✓ Apply safe electrical skills ✓ Perform basic workshop practices
3	Review Assessment papers	Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following. <ul style="list-style-type: none"> ✓ Identify and explain functions tools used in mechanical workshop ✓ Identify and explain properties of various pipes and their applications ✓ Use measuring instruments properly ✓ Apply safe electrical skills ✓ Perform basic workshop practices
4	Demonstrate how to use breaker bar and cheater	The student is expected to follow the correct step-by step process to using a breaker bar and cheater. The elements which should be assessed are: <ul style="list-style-type: none"> ✓ It is used to break loose stubborn bolts and nuts that have rusted tight. The cheater is used as an extension when slipped over the handle to gain more torque. This tool should only be used with impact sockets.

3. OW =Observation at work Place

#	Activity to be observed	Evaluative Assessment of the observed activity
1	Assessment papers	While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students. <ul style="list-style-type: none"> ✓ Identify and explain functions tools used in mechanical workshop ✓ Identify and explain properties of various pipes and their applications ✓ Use measuring instruments properly

		<ul style="list-style-type: none"> ✓ Apply safe electrical skills ✓ Perform basic workshop practices
2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to developing a good basic knowledge of mechanical fittings practices prior to proceeding to the development of Plumbing knowledge and skills.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Demonstrate how to assemble a flange joint	As the students attend the practical test to check their knowledge about flange joints and how to assemble them, make sure the student use the proper techniques and the information he shared is accurate.
5	Demonstrate how to diagnose faults	As the students attend the practical test to check their knowledge about troubleshooting, make sure the student use the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Answers
1	Identify and explain functions tools used in mechanical workshop	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Identify and explain properties of various pipes and their applications
2	Identify and explain properties of various pipes and their applications	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Identify types of pipes used in plumbing and sewerage services ✓ Interpret functions and their application within plumbing services and sewerage operations ✓ Demonstrate joining methods of the pipes ✓ Familiarize with fitting used on these different pipes
3	Use measuring instruments properly	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Identify names and functions of various measuring instruments used in mechanical workshop ✓ Demonstrate use of various measuring instruments

4	Apply safe electrical skills	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Interpret electrical safety ✓ Familiarize with functions and applications of electrical tools and equipment ✓ Perform simple electrical circuits ✓ Perform electrical measurements using measuring devices on single phase and three phase equipment. ✓ Diagnose faults on electrical connections on electrically operated appliances
5	Perform basic workshop practices	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Undertake marking out on pipe ✓ Perform pipe cutting methods ✓ Perform drilling holes on pipes ✓ Perform filing on pipes

5. TRB/LB =Trainee’s Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee’s Record/Log Book	As training progresses, students need to be given “Trainee’s Record Book” or “Log Book”. Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, “TR-Trainer Report” or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-10: Carry out simple concreting and rendering

Unit No 10
 Unit Title Carry out simple concreting and rendering
 Unit Code CONS08CR02V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources*
1. Prepare for work							
Work health and safety and quality assurance requirements are identified and adhered	✓	✓		✓	✓	✓	
Tools and equipment, including personal protective equipment, are selected and checked for serviceability	✓		✓	✓	✓		✓
Sustainability principles and concepts are applied	✓	✓	✓	✓		✓	✓
2. Place concrete							
Concrete mixture is prepared to meet job and manufacturer requirements	✓	✓	✓	✓		✓	✓
Formwork or excavation area is cleaned of excess material and debris prior to concrete placement	✓	✓		✓	✓	✓	
Concrete is safely transported by an approved method	✓		✓	✓	✓		✓
Concrete is placed in formwork or placement site to specified depth ensuring all cavities are filled	✓	✓	✓	✓		✓	✓
Concrete is screened to the alignment of formwork and project specified datums	✓	✓		✓	✓	✓	
Surface of concrete is finished according to specifications	✓		✓	✓	✓		✓
3. Place rendering							
Render mixture is prepared to meet manufacturer requirements	✓	✓	✓	✓		✓	✓
Render is safely transported by an approved method	✓	✓		✓	✓	✓	
Render is applied in the required location	✓		✓	✓	✓		✓
Surface of render is finished according to specifications	✓	✓	✓	✓		✓	✓
4. Clean up							
Work area is cleared and materials disposed of, reused or recycled according to legislation, regulation, codes of practice and job specification	✓	✓	✓	✓		✓	✓

Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures	✓	✓		✓	✓	✓	
Information is accessed and documentation completed according to workplace requirements	✓		✓	✓	✓		✓

Note:

✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies, FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

#	Question	Answer
1	List some potential hazards for workers in concrete manufacturing?	<ul style="list-style-type: none"> ✓ Eye, skin and respiratory tract irritation from exposure to cement dust; ✓ Inadequate safety guards on equipment; ✓ Inadequate lockout/tagout systems on machinery; ✓ Overexertion and awkward postures; ✓ Slips, trips and falls; and ✓ Chemical burns from wet concrete
2	Explain how cement dust can be a hazard for workers in concrete manufacturing?	Exposure to cement dust can irritate eyes, nose, throat and the upper respiratory system. Skin contact may result in moderate irritation to thickening/cracking of skin to severe skin damage from chemical burns. Silica exposure can lead to lung injuries including silicosis and lung cancer.
3	Give three solutions for when workers come into contact with cement dust.	<ul style="list-style-type: none"> ✓ Rinse eyes with water if they come into contact with cement dust and consult a physician. ✓ Use soap and water to wash off dust to avoid skin damage. ✓ Wear a P-, N- or R-95 respirator to minimize inhalation of cement dust. ✓ Eat and drink only in dust-free areas to avoid ingesting cement dust.
4	Explain how wet concrete can be a hazard for workers in concrete manufacturing?	Exposure to wet concrete can result in skin irritation or even first-, second- or third-degree chemical burns. Compounds such as hexavalent chromium may also be harmful.
5	Give three solutions for when workers come into contact with wet concrete.	<ul style="list-style-type: none"> ✓ Wear alkali-resistant gloves, coveralls with long sleeves and full-length pants, waterproof boots and eye protection. ✓ Wash contaminated skin areas with cold, running water as soon as possible.

		✓ Rinse eyes splashed with wet concrete with water for at least 15 minutes and then go to the hospital for further treatment.
6	Explain how unguarded machinery can be a hazard for workers in concrete manufacturing?	Unguarded machinery used in the manufacturing process can lead to worker injuries.
7	List three ways injuries by unguarded machinery can be prevented.	<ul style="list-style-type: none"> ✓ Maintain conveyor belt systems to avoid jamming and use care in clearing jams. ✓ Ensure that guards are in place to protect workers using mixers, block makers, cubers and metalworking machinery such as rebar benders, cutters and cage rollers. ✓ Establish and follow effective lockout/tagout procedures when servicing equipment. ✓ Be sure appropriate guards are in place on power tools before using them.
8	Explain how confined spaces can be a hazard for workers in concrete manufacturing?	Mixers and ready-mix trucks have confined spaces that pose safety risks for workers.
9	List three ways injuries by confined spaces can be prevented.	<ul style="list-style-type: none"> ✓ Follow established procedures for confined space entry and work to assure safety. ✓ Guard against heat stress when cleaning truck mixer drums. ✓ Wear appropriate protective equipment to avoid silica exposure when removing concrete residues from inside truck mixer drums.
10	Concrete is a mixture of what?	Concrete is a mixture of cement, water, coarse and fine aggregates and (possibly) admixtures.
11	What does increasing the cement content of the mix do?	Therefore, to increase the strength, increase the cement content of a mix.
12	Explain the relationship between water content and the concrete mix,	As the Water to Cement ratio INCREASES, the strength and durability of hardened concrete DECREASES. To increase the strength and durability of concrete, decrease the Water/Cement ratio.
13	Should shovels be used to measure the materials? Explain your answer.	Never use a shovel as a measure as volumes can vary widely.
14	Explain in detail the process of mixing.	<p>When site mixing, begin by loading a MEASURED AMOUNT of coarse aggregate into the mixer drum. Add the sand before the cement, both in measured amounts.</p> <p>Mix materials together until there is no visible sand in the mix.</p> <p>Add enough water to get a workable mix.</p> <p>Be careful not to overload the mixer. Too much concrete in the mixer means each batch takes longer to</p>

		<p>be properly mixed, which causes costly delays in the long run or it will not mix at all.</p> <p>Small quantities of concrete may be mixed by hand with a shovel. Mixing should be done on a clean board, or plate, or in a wheelbarrow. Mix the materials together until they are even. Then dish the material and add water. Use only enough water to get an even, workable mix.</p> <p>Finish mixing.</p>
15	What should you consider when measuring the thickness of the slab?	The thickness will depend on the weight the concrete must carry (ie a driveway carries the weight of a car and needs to be thicker than a garden path).
16	Explain the process of excavation briefly.	The ground should be excavated as required by the finished levels. Any roots or grass must be dug out until there is firm soil to place on. Always dig the hole wider. The ground should be excavated as required by the finished levels. Any roots or grass must be dug out until there is firm soil to place on. Always dig the hole wider.
17	Define subgrade.	The soil a concrete pavement or floor rests on is called the subgrade.
18	In what condition should the subgrade be in before building?	If the soil is soft or varies in softness, a layer of crushed rock (known as a subbase) should be provided. If there are only a few poor areas these can be dug out, refilled and compacted. It is important that the soil evenly supports the concrete.
19	What is the underlay?	The underlay, or vapour barrier, is a heavy plastic covering the ground to minimise water vapour rising through the hardened concrete.
20	What's another name used to refer to underlay?	Vapour barrier.
21	Explain the process of underlay.	Always overlap the sheets a minimum of 200 mm and do not tape them. Tape the edges of sheets only around drainage pipes or services which pass vertically through the concrete slab. Termite protection may be required around service penetrations, at joints and around the perimeter of the slab.
22	What is reinforcement used for?	Reinforcement can be used to increase the strength of concrete and/or to help control cracking.
23	The concrete that protects steel from rusting when reinforcing is referred to as what?	The cover.
24	What is the appropriate amount of cover that should be used?	The amount of cover depends on whether the slab is inside or outside, is in contact with the ground or protected by a membrane. It is measured to the top, side or bottom of the outer surface.
25	What three things should be avoided when transporting and placing concrete?	<ul style="list-style-type: none"> ✓ Delays ✓ Segregation ✓ Wastage
26	Identify three types of concrete transportation methods.	✓ concrete truck

		<ul style="list-style-type: none"> ✓ concrete pump, ✓ crane and bucket ✓ chute ✓ conveyor ✓ hoist.
27	Explain the consequences of delays.	Delays can cause the concrete to dry-out and stiffen. Delays are more of a problem on hot and/or windy days when the concrete will dry-out and stiffen more quickly.
28	Define segregation.	Segregation is when the coarse and fine aggregate, and cement paste, become separated
29	Explain the consequences of segregation.	<p>Segregation makes the concrete:</p> <ul style="list-style-type: none"> ✓ Weaker, ✓ Less durable, ✓ And will leave a poor Surface Finish.
30	Explain how to avoid segregation.	<p>Check the concrete is not 'too wet' or 'too dry'. Make sure the concrete is properly mixed. It is important that the concrete is mixed at the correct speed in a transit mixer for at least two minutes immediately prior to discharge. The concrete should be placed as soon as possible. When transporting the mix, load carefully. If placing concrete straight from a truck, place vertically and never let the concrete fall more than one-and-a-half metres.</p> <p>Always place new concrete into the face of concrete already in place. When compacting with a poker vibrator be sure to use it carefully.</p> <p>Never spread concrete sideways with a poker vibrator as this may cause segregation of the mix. Always be sure to vibrate concrete evenly.</p>
31	Explain the relationship between the removal time and weather.	In cold weather, concrete will take longer to gain strength than in warm weather, removal times will therefore be longer. In mild conditions (around 20°C) 7 days is long enough to leave the forms in place, unless the concrete is suspended when other considerations apply.
32	Explain finishing.	Finishing is screeding, floating and/or trowelling the concrete surface to densify and further compact the surface layer of concrete, as well as giving it the look you want.
33	What are the two stages in floating?	<ul style="list-style-type: none"> ✓ The bullfloat, which is part of the initial finishing. ✓ The power or hand float which is part of the final finishing.
34	What are cement-based renders used for?	Cement-based renders, while typically used to provide a smooth flat finish over a rough surface, can also be used to improve the water-proofing of the surface and provide a decorative finish through the use of colour and various surface textures.
35	Identify the materials required for cement-based render.	<ul style="list-style-type: none"> ✓ Cement

		<ul style="list-style-type: none"> ✓ Lime ✓ Sand ✓ Water ✓ Admixtures ✓ Pre-bagged or dry-mix products
36	Briefly explain why lime is needed.	Hydrated lime or building lime is suitable. Lime is added to make the render creamier and easier to work with. It also assists to minimise cracking as it provides some elasticity to the render once it has hardened. It is good practice (but not essential) to soak the lime in an equal volume of water for 24 hours prior to use, as this will improve its performance in the mix.
37	Briefly explain why sand is needed.	Sand should be clean and free from clay and vegetable matter. In general, coarsely graded sands are suitable for undercoats whilst finer graded sands are appropriate for finishing coats. Plastering sands and finer, washed, concrete sands (which are also suitable for plastering) are readily available from retail hardware and building supply outlets.
38	Most dry-mixed render products are suitable for?	<ul style="list-style-type: none"> ✓ Masonry block, brick, concrete and stonework backgrounds ✓ Internal and external locations ✓ Single or multiple layers (or coats) depending on the thickness required
39	Briefly explain how pre-bagged render mixes, cement and lime should be stored.	Pre-bagged render mixes, cement and lime should be stored in bags off the ground in a dry environment such as a waterproof shed. The air circulation around the bags should be minimised and they should be used on a 'first-in/first-out' basis. Long storage periods of cement-based products should be avoided as their shelf life is in the order of 12 months.
40	Briefly describe the process of using a mechanical mixer.	<p><i>Step 1</i> Turn the mixer on and add about a litre of water to 'prime' the bowl.</p> <p><i>Step 2</i> Add the sand, pigment (if any), and then the cement and lime.</p> <p><i>Step 3</i> Blend together until a uniform colour is achieved.</p> <p><i>Step 4</i> Add water slowly until a stiff mix that will 'sit up' on a trowel is achieved.</p> <p><i>Step 5</i> Continue mixing for at least two to three minutes to ensure consistency.</p> <p><i>Step 6</i> Empty/discharge the mixer. Repeat the process until the required amount of render has been produced.</p>
41	Briefly describe the process of mixing by hand.	<p><i>Step 1</i> Measure all the required dry materials for the batch into a wheelbarrow or onto a board.</p> <p><i>Step 2</i> Mix dry materials together until a uniform colour is achieved.</p> <p><i>Step 3</i> Mound the material and form a crater in the centre.</p> <p><i>Step 4</i> Add water slowly into the crater and turn the material into the water.</p>

		<p><i>Step 5</i> Repeat Steps 3 and 4 until a stiff mix that will 'sit up' on a trowel is achieved.</p> <p><i>Step 6</i> Continue turning and mixing the material for a couple of minutes to ensure all the sand is uniformly coated with paste.</p> <p><i>Step 7</i> Use render.</p>
42	Explain in depth surface dampening.	<p>After initial preparation, weak and/or porous background surfaces such as lightweight concrete (eg Hebel blocks) and render undercoats (see below) should be dampened and allowed to dry back to a surfacedry condition immediately prior to rendering. This reduces excessive suction of water out of the render, but still enables a bond to be achieved to the weaker and open-textured backgrounds by allowing time for cement particles to also be drawn into the surface of the background material. Number of coats Depending on the unevenness of the background, a number of coats may be required to build the surface up to a flat finish. In this case, the initial coats are referred to as undercoats and the last coat is referred to as the final coat. Usually, one or two coats will be sufficient for most work and at least three days should be allowed between coats. The conditions to which the render will be exposed and the type of finish may also dictate the number of coats. Allow at least three days between coats.</p>
43	Give two reasons why cement-based renders may crack.	<ul style="list-style-type: none"> ✓ shrinkage as the render dries out ✓ movement of the background material

2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to carrying out simple concreting and rendering, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	<p>Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Place concrete ✓ Place rendering ✓ Clean up
3	Review Assessment papers	<p>Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Place concrete ✓ Place rendering ✓ Clean up

4	Demonstrate how to accurately proportion and mix concrete	<p>The student is expected to follow the correct step-by step process to proportion and mix concrete. The elements which should be assessed are:</p> <ul style="list-style-type: none"> ✓ Cement content ✓ Water content ✓ Water to cement ratio ✓ Aggregates
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3. OW =Observation at work Place

#	Questions	Answers
1	Assessment papers	<p>While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Place concrete ✓ Place rendering ✓ Clean up
2	Log Books	<p>Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.</p>
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to performing minor repairs and undertake minor concreting and rendering tasks.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Demonstrate how to transport and place concrete accurately	<p>As the students attend the practical test to check their knowledge about transporting and placing concrete, make sure the student use the proper techniques and the information he shared is accurate.</p>
5	Demonstrate how to mix render properly	<p>As the students attend the practical test to check their knowledge about mixing render, make sure the student use the proper techniques and the information he shared is accurate.</p>

4. OQ=Oral Questioning

#	Questions	Answers
1	Prepare for work	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work health and safety and quality assurance requirements are identified and adhered. ✓ Tools and equipment, including personal protective equipment, are selected and checked for serviceability. ✓ Sustainability principles and concepts are applied.
2	Place concrete	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Concrete mixture is prepared to meet job and manufacturer requirements. ✓ Formwork or excavation area is cleaned of excess material and debris prior to concrete placement. ✓ Concrete is safely transported by an approved method. ✓ Concrete is placed in formwork or placement site to specified depth ensuring all cavities are filled. ✓ Concrete is screened to the alignment of formwork and project specified datums. ✓ Surface of concrete is finished according to ✓ specifications.
3	Place rendering	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Render mixture is prepared to meet manufacturer requirements. ✓ Render is safely transported by an approved method. ✓ Render is applied in the required location. ✓ Surface of render is finished according to specifications.
4	Clean up	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work area is cleared and materials disposed of, reused or recycled according to legislation, regulation, codes of practice and job specification. ✓ Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures. ✓ Information is accessed and documentation completed according to workplace requirements.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-11: Prepare Estimates and Read layouts

Unit No	11
Unit Title	Prepare Estimates and Read layouts
Unit Code	CONS08CR03V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Determine customer requirements							
Data required for welding job, collected from the models, sketches or drawings supplied, or by visiting the client's sites (free hand drawing with isometric drawing)	✓		✓	✓	✓		✓
Purpose & type of the welding and material required, determined by interpreting sketches/drawings/ models supplied by customer/client	✓	✓		✓	✓	✓	
Conceptual drawings, work plan, for the job prepared, briefed to client & approval for the production obtained	✓		✓	✓	✓		✓
2. Develop a sketch and prepare estimates for the fabrication							
Sketches /drawings prepared with available data	✓		✓	✓	✓		✓
Accessories, and other fixtures / components listed as required for the welding of the job listed	✓	✓		✓	✓	✓	
Machinery & tools required for the welding job listed	✓		✓	✓	✓		✓
Material quantified and cost estimated including added percentage for wastage	✓		✓	✓	✓		✓
Welding time estimated considering worksite conditions and welding hours & charges for welding of individual components of the job calculated	✓	✓		✓	✓	✓	
Complete estimate for the welding prepared, by adding full cost of production, cost for transport & logistics, inclusive of overheads and profit, according to company policy	✓		✓	✓	✓		✓
3. Prepare work plan & obtain clients approval to commence work							
Work plans/flowcharts for the welding each item of the prepared & due dates for completion estimated	✓		✓	✓	✓		✓

Cost of entire welding job & the due date of delivery/handing over informed to the client	✓	✓		✓	✓	✓	
Approval to commence the welding job obtained from the client, by submitting drawings, cost estimate & other relevant information and by negotiating & agreeing to deliver on targets	✓		✓	✓	✓		✓

Note:

✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

	Question	Answer
1	What are two things you need to do when determining your target audience?	<ul style="list-style-type: none"> ✓ establishing who needs your service ✓ establishing who has already used your service
2	Identify three things to consider when determining your target audience.	<ul style="list-style-type: none"> ✓ Age ✓ Gender ✓ Income level
3	Identify seven service professionals you should add to your target audience.	<ul style="list-style-type: none"> ✓ Real Estate Agents ✓ Property Management Companies ✓ Electricians ✓ Appliance Repairs Services ✓ Roofing Companies ✓ Landscape Architects ✓ General Contractors ✓ Interior Designers ✓ And other local businesses
4	What are three materials that are no longer used for piping, and why?	<p>☒ Cast iron, galvanized steel, and polybutylene piping are also no longer used in homes due to various issues with breakage and deterioration. If these pipes are found in your home, a full replacement will be recommended. This could turn a simple repair into a big expense.</p>
5	Identify the elements of a successful plumbing plan.	<ul style="list-style-type: none"> ✓ Key coding ✓ DWV Elevation ✓ Supply drawing
6	Briefly explain key coding.	<p>It's a good idea to code your map to keep the different elements straight. Show drainpipes with solid lines and supply lines with broken lines. Indicate vertical runs with notes on the overhead view. Mark hot and cold supply lines with colored pencils and color-code drains and vents. Point to pipe sizes with a curved leader line to avoid mistaking the leader for a pipe. You might need to draw several versions of the plumbing plan before you get all the details right.</p>

7	What does DWV stand for in DWV elevation?	Drain-waste-vent.
8	Briefly explain DWV elevation.	A drain-waste-vent (DWV) elevation describes the system that will carry water, waste, and air out of the house. This part of your plumbing plan should note the upward path of the stack, vents, and revents; the length of drainpipe runs; and traps. Its primary purpose is to show how the fixtures will be vented. It doesn't have to be drawn over an architectural drawing, although that can be helpful for reference.
9	Define supply drawing.	A supply drawing indicates the estimated length of supply pipes.
10	Briefly explain supply drawing.	A supply drawing indicates the estimated length of supply pipes. Be sure to include the pipe size as well. The main purpose of this drawing is to determine the minimum size of the pipes. Refer to this plumbing plan as you make your shopping list of materials to ensure you purchase the right sizes and lengths.

2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to preparing estimates and reading layouts, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas. <ul style="list-style-type: none"> ✓ Determine customer requirements ✓ Develop a sketch and prepare estimates for the fabrication ✓ Prepare work plan & obtain clients approval to commence work
3	Review Assessment papers	Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following. <ul style="list-style-type: none"> ✓ Determine customer requirements ✓ Develop a sketch and prepare estimates for the fabrication ✓ Prepare work plan & obtain clients approval to commence work
4	Demonstrate how to make a work plan	The student is expected to follow the correct step-by step process to proportion and mix concrete. The elements which should be assessed are: <ul style="list-style-type: none"> ✓ Key coding ✓ DWV elevation ✓ Supply drawing

3. OW =Observation at work Place

#	Questions	Answers
1	Assessment papers	<p>While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.</p> <ul style="list-style-type: none"> ✓ Determine customer requirements ✓ Develop a sketch and prepare estimates for the fabrication ✓ Prepare work plan & obtain clients approval to commence work
2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to planning and preparing estimates for and reading layouts.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Accurately prepare estimates for plumbing	As the students attend the practical test to check their knowledge about estimations in plumbing, make sure the student use the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Answers
1	Determine customer requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Data required for welding job, collected from the models, sketches or drawings supplied, or by visiting the client's sites (free hand drawing with isometric drawing) ✓ Purpose & type of the welding and material required, determined by interpreting sketches/drawings/models supplied by customer/client ✓ Conceptual drawings, work plan, for the job prepared, briefed to client & approval for the production obtained
2	Develop a sketch and prepare estimates for the fabrication	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Sketches /drawings prepared with available data

		<ul style="list-style-type: none"> ✓ Accessories, and other fixtures / components listed as required for the welding of the job listed ✓ Machinery & tools required for the welding job listed ✓ Material quantified and cost estimated including added percentage for wastage ✓ Welding time estimated considering worksite conditions and welding hours & charges for welding of individual components of the job calculated ✓ Complete estimate for the welding prepared, by adding full cost of production, cost for transport & logistics, inclusive of overheads and profit, according to company policy
3	Prepare work plan & obtain clients approval to commence work	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work plans/flowcharts for the welding each item of the prepared & due dates for completion estimated ✓ Cost of entire welding job & the due date of delivery/handing over informed to the client ✓ Approval to commence the welding job obtained from the client, by submitting drawings, cost estimate & other relevant information and by negotiating & agreeing to deliver on targets.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc. Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.

Unit-12: Install Domestic water pipe systems

Unit No	12
Unit Title	Install Domestic water pipe systems
Unit Code	CONS08CR05V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Plan and prepare							
Work instructions and relevant information, including plans, specifications, quality requirements and operational details relevant to the tasks, are obtained	✓		✓	✓	✓		✓
Signage requirements are identified and obtained from project traffic management plan and traffic conditions and are implemented	✓	✓		✓	✓	✓	
Plant, tools and equipment selected to carry out tasks are consistent with requirements of the job, are checked for serviceability and any faults are rectified or reported	✓		✓	✓	✓		✓
Environmental requirements are identified from project environmental management plan, confirmed and applied to the allotted task	✓	✓		✓	✓	✓	✓
2. Set out and excavate							
Work area and materials are prepared to support efficient installation of the pipe work	✓		✓	✓	✓		✓
Dewatering requirements are determined and applied	✓	✓		✓	✓	✓	
Location, alignment direction, level and grade of mains pipe system are determined from job drawings	✓		✓	✓	✓		✓
Works are set out to specification	✓	✓		✓	✓	✓	✓
Plant operator is advised of excavation requirements and levels are monitored	✓		✓	✓	✓		✓
Mains pipe system support mechanism is installed according to plans, specifications and standards	✓	✓		✓	✓	✓	
3. Install pipeline							
Pipes are lowered joined according to manufacturer specifications using pipe joining methods	✓		✓	✓	✓		✓

Pipes are placed and fittings, valves and flow control devices are fitted according to drawings, specifications and installation procedures	✓	✓		✓	✓	✓	
Alignment level and grade are checked continuously for conformance with design plans and specifications	✓		✓	✓	✓		✓
Side support or overlay is positioned beside the pipes	✓	✓		✓	✓	✓	✓
Main pipe system support structure is checked	✓		✓	✓	✓		✓
Backfill procedure and concepts are observed when preparing for and undertaking work process	✓	✓		✓	✓	✓	
4. Test pipe system							
Testing is performed to relevant authorities' requirement as determined by specifications	✓		✓	✓	✓		✓
Pipe system test procedure are performed	✓	✓		✓	✓	✓	
Test results are recorded and reported	✓		✓	✓	✓		✓
5. Clean up							
Work area is cleared and materials disposed of, reused or recycled according to legislation	✓		✓	✓	✓		✓
Plant, tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and standard work practices	✓	✓		✓	✓	✓	

Note:

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

#	Question	Answer
1	Listen four things to consider before you start the operation.	<ul style="list-style-type: none"> ✓ The site ✓ The weather ✓ Traffic ✓ Hazards ✓ The task ✓ Plant ✓ Attachments ✓ Communications ✓ Procedures and rules
2	What does excavation work generally involve?	Excavation work generally means work involving the removal of soil or rock from a site to form an open face, hole or cavity, using excavators.
3	What is an excavator?	An excavator is a self-propelled vehicle (either crawler or wheeled) with an upper structure, which can rotate 360 degrees. It can excavate, then swing and discharge materials.
4	Identify seven types of measuring and layout	<ul style="list-style-type: none"> ✓ Tapes ✓ Rules

	tools used by a plumber.	<ul style="list-style-type: none"> ✓ Squares ✓ Alignment tools
5	What does a builder's level consist of?	<ul style="list-style-type: none"> ✓ Telescope ✓ Graduated leveling vial ✓ Graduated horizontal circle ✓ Leveling screws ✓ Focusing knob ✓ Base ✓ Eyepiece ✓ Horizontal clamp screw ✓ Horizontal tangent screw ✓ Vernier scale
6	List the equipment normally used by a plumber.	<ul style="list-style-type: none"> ✓ Bench vice ✓ Pipe vice ✓ Pipe wrench ✓ Chain wrench ✓ Pipe cutter ✓ Hacksaw ✓ Spanner ✓ Plier ✓ Screwdriver ✓ Hammer ✓ Files ✓ Drills
7	Explain the function of a pipe wrench.	<p>One of the first tools people associate with plumbing is the pipe wrench. It's adjustable and has lots of play in the grip. Its teeth face inward. Plumber probably won't even have to lift it off the pipe he is turning. Normally, he shall need two pipe wrenches: one to hold the pipe steady and a second to remove the nut or other attachment. The pipe wrench is an adjustable wrench used for turning iron pipes and fittings with a rounded surface. The design of the adjustable jaw allows it to rock in the frame, such that any forward pressure on the handle tends to pull the jaws tighter together.</p>
8	Explain the function of a hacksaw.	<p>Many hacksaws have a two-part adjustable frame and a pistol grip handle. Hacksaws are used by plumbers to cut pipes and occasionally by electricians to cut conduit. The hacksaw got its name because historically these saws did not cut smoothly.</p>
9	Explain the function of a spanner.	<p>Spanners: Spanners are used for fixing and opening nuts and bolts. Different types of spanners are available such as double ended spanner, ring spanners, socket spanners. The material used are Chrome Vanadium Steel / Carbon Steel. Spanners are available in set of different sizes.</p>
10	Explain the function of a drill machine.	<p>A drill is a tool with a rotating drill bit used for drilling holes in various materials. The drill bit is gripped by a chuck at one end of the drill, and is pressed against the target material and rotated. The tip of the drill bit does the work of cutting into the target material, either slicing off thin shavings. Plumbers normally use hand operated drilling machine for drilling holes.</p>

		All sizes of drill bits are available depending upon the size of hole to be drilled.
11	Explain in detail environmental considerations that should be looked at when starting the operation.	<p>During the digging process, make sure the process doesn't jeopardise previously installed pipes or cables and make sure the water pipe network layout drawing accounts for any such cables or pipes prior to the commencement of the work.</p> <p>During digging and before placing the pipe network, make sure, the grounds are analyzed well to ensure longer life of the installed pipe network. It is important to note that environmental stress on critical pipe joints can cause cracking and severe fractures, which require immediate pipe repair to limit their effects. Factors like these, when compounded with high surface pressure, human error, or poor pipe structure, can easily result in full collapse.</p> <p>Prior to pipe installation, it is also important to analyse particular digging areas as pipe strengths are influenced by sudden drops in temperature during winter months. When water freezes within underground pipe systems, it builds pressure exponentially, which may result in burst pipes. This is a high-risk factor that affects pipes of any size and material.</p>
12	Why is determining level of water important when implementing the water pipe network?	To carry out dewatering. However, if water level is low, dewatering arrangements need to be implemented as part of the pipe network installation.
13	What are the three things that the plant operator should know about before the operation starts?	<ul style="list-style-type: none"> ✓ Working out the path of movement for plant, vehicles and materials. ✓ Identifying hazards, and taking suitable actions to deal with them. ✓ Making sure all equipment, resources and workers are available for the task.
14	List the benefits that come from installing a support mechanism for mains pipe system.	<ul style="list-style-type: none"> ✓ Pipe supports should shield pipes from metal-to-metal contact. ✓ They protect against the rough abrasion of pipe movement. ✓ They perform under high compressive loads. ✓ They hold up in harsh environmental conditions. ✓ They provide a low coefficient of friction
15	Explain why supports performing under high compressive loads can be considered a benefit.	Pipes can be extremely heavy and forceful, and so the brunt of their weight has to go somewhere. Much of the time, that "somewhere" is a pipe support. Quality pipe supports will have a high compressive strength. Compressive strength dictates how much weight a support can handle before its performance suffers. The value here is easy to see. If a pipe support can't uphold the weight of a piping system, it could collapse and wreck the whole system.
16	Explain why supports providing a low coefficient of friction can be considered a benefit.	When you dive onto a wet slip-and-slide, you will glide across the lawn. But if you dive onto wet concrete, you'll come to a sharp stop, tearing your skin in the process. Why is that? The answer is your coefficient of friction, and having a low coefficient of friction is an important quality to look for in a

		<p>well-made pipe support. Simply put, coefficient of friction is a way to calculate friction. It accounts for both the friction between two objects and the force that's pressing them together.</p> <p>In piping, a simple example of a product with a low coefficient of friction is the Protek U-Bolt. It's a U-bolt, and so its bare metal surface would normally rub directly against metal pipes. However, in this case, the support includes a thermoplastic coating that gives it a low coefficient of friction. This makes it easier for pipes to move axially and avoid damage.</p>
17	Identify some material types used for water mains.	<ul style="list-style-type: none"> ✓ Ductile iron pipe ✓ Polyvinyl chloride ✓ Concrete steel cylinder ✓ Polyethylene
18	Explain briefly what to consider about the installation site.	<p>It is absolutely essential to ensure that the pipes are laid on a bed of granular materials to provide even and continuous support along the whole length of pipe. A thick bed of granular material free from large stone from trench excavation, gravel, and broken stone graded between 5mm to 10mm, coarse sand, sand and gravel mix are all acceptable as bedding material. The type of bedding material and its thickness is usually specified in the drawings. Caution tapes (warning tapes) shall be installed in the pipe trench 500 mm above the crest of the pipe for all diameters of pipes being installed.</p>
19	Give three reasons why pipe fittings are used in piping systems.	<ul style="list-style-type: none"> ✓ to connect straight pipe or tubing sections ✓ to adapt to different sizes or shapes, ✓ to branch or re-direct the piping system, ✓ if necessary to provide a jointing method if two dissimilar piping materials are used in the one system, ✓ for other purposes, such as regulating, measuring or changing the direction of the fluid flow or to connect up threaded pipe and equipment
20	List five types of pipe fittings.	<ul style="list-style-type: none"> ✓ Reducing tee ✓ Flange ✓ Tee ✓ Cap ✓ Reducing union ✓ Reducer union ✓ Coupling
21	Identify three reasons why flow control valves are used.	<ul style="list-style-type: none"> ✓ valves perform various functions to regulate the operation of a water distribution system ✓ shutting flow off completely ✓ throttling the flow down to a lower flow rate
22	Briefly describe inspections that are carried out to ensure the water pipe network developed remains of high quality.	<ul style="list-style-type: none"> ✓ Pipe network in the premises should be designed for optimum discharge of water ✓ The pipe network should be laid and fixed that it does not pass by the side of any sewage line or refuse drain nor does

		<p>it pass through any field of foul ground where dirt or city have been deposited and manure dumps.</p> <ul style="list-style-type: none"> ✓ The pipe network should be laid and fixed so that it shall be accessible at anytime for attending to damages, leakages etc.
23	Define bedding.	The bedding is the cushion material between the pipes and the foundation.
24	What is the function of the bedding?	Its function is to ensure uniform support for the pipeline both with regard to grade and hardness.
25	Briefly describe how side support or overlay should be positioned beside the pipes.	The best bedding material is granular and uniformly graded which assists in handling and spreading. It only needs sufficient compaction to ensure that laying tolerances are maintained when pipes are laid and backfilled. Holes (recesses) in bedding must be provided for the protruding socket to ensure uniform support of the barrel and hard point supports must be avoided.
26	What is a water pipe?	A water pipe is any pipe or tube designed to transport drinking water to consumers.
27	What is backfilling?	Backfilling is the process of putting the soil back into a trench or foundation once excavation, and the related work has been completed.
28	Briefly explain how to backfill a trench.	<p>In case of backfilling a trench, fill the lower portion of the trench by depositing approved backfill and bedding material in layers of 6 inches maximum thickness, and compact with suitable tampers to the density of the adjacent soil until there is a cover of not less than 12 inches, using special care not to damage pipe and pipe coatings.</p> <p>After soil is backfilled into a trench, the loose material is compacted using some mechanical means, such as a compactor, an excavator, or a "jumping jack"-type compactor.</p>
29	Briefly describe the conditions that should be fulfilled prior to undertaking testing.	<ul style="list-style-type: none"> ✓ Pressure testing is a potentially dangerous operation and all hazards should be addressed, including the establishment of exclusion zones where necessary. ✓ Prior to testing, the entire pipeline should be checked to ensure all debris and construction materials are removed from contact with the pipes and fittings. ✓ Where concrete anchor or thrust blocks are used no pressure testing should take place within 7 days of casting the blocks. ✓ All mechanical ring seal joints must be restrained either by sand bags, or by partial backfilling of the line leaving the joints open for visual inspection. All valves must be placed in the open position, and a valve provided at the end of the line to allow air to be vented from the line during filling. ✓ Where thermal fusion jointing has been used, no testing should take place until the joints have completely cooled to ambient temperature. ✓ Local EPA regulations need to be reviewed prior to performing tests.

30	List the tests that should be performed on the completed water pipe network.	<ul style="list-style-type: none"> ✓ Swabbing or pigging ✓ Pressure test ✓ Leakage ✓ Chlorination
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2. PT=Practical Test

#	Practical Activity	Additional Details
1	Student Assignments	Students need to undertake assignments related to installing domestic water pipe systems, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas. <ul style="list-style-type: none"> ✓ Plan and prepare ✓ Set out and excavate ✓ Install pipeline ✓ Test pipe system ✓ Clean up
3	Review Assessment papers	Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following. <ul style="list-style-type: none"> ✓ Plan and prepare ✓ Set out and excavate ✓ Install pipeline ✓ Test pipe system ✓ Clean up
4	Demonstrate how to properly install mains pipe system support mechanism	The student is expected to follow the correct step-by step process to installing support mechanism for mains pipe system. The elements which should be assessed are: <ul style="list-style-type: none"> ✓ Pipe supports should shield pipes from metal-to-metal contact

3. OW =Observation at work Place

#	Observation Area	Additional details of the observation
1	Assessment papers	While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students. <ul style="list-style-type: none"> ✓ Plan and prepare ✓ Set out and excavate ✓ Install pipeline ✓ Test pipe system ✓ Clean up

2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to setting up water pipe network across the locations within the buildings such as installing water pipes systems in toilets, kitchen and other needful areas.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Demonstrate how to accurately install pipeline	As the students attend the practical test to check their skill in installing a pipeline, make sure the student use the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Assess and evaluating parameters
1	Plan and prepare	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work instructions and relevant information, including plans, specifications, quality requirements and operational details relevant to the tasks, are obtained, ✓ Signage requirements are identified and obtained from project traffic management plan and traffic conditions and are implemented. ✓ Plant, tools and equipment selected to carry out tasks are consistent with requirements of the job, are checked for serviceability and any faults are rectified or reported. ✓ Environmental requirements are identified from project environmental management plan, ✓ confirmed and applied to the allotted task.
2	Set out and excavate	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work area and materials are prepared to support efficient installation of the pipe work. ✓ Dewatering requirements are determined and applied. ✓ Location, alignment direction, level and grade of mains pipe system are determined from job drawings. ✓ Works are set out to specification.

		<ul style="list-style-type: none"> ✓ Plant operator is advised of excavation requirements and levels are monitored. ✓ Mains pipe system support mechanism is installed according to plans, specifications and standards.
3	Install pipeline	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Pipes are lowered joined according to manufacturer specifications using pipe joining methods ✓ Pipes are placed and fittings, valves and flow control devices are fitted according to drawings, specifications and installation procedures ✓ Alignment level and grade are checked continuously for conformance with design plans and specifications ✓ Side support or overlay is positioned beside the pipes. ✓ Main pipe system support structure is checked ✓ Backfill procedure and concepts are observed when preparing for and undertaking work process
4	Test pipe system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Testing is performed to relevant authorities' requirement as determined by specifications ✓ Pipe system test procedure are performed, ✓ Test results are recorded and reported
5	Clean up	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work area is cleared and materials disposed of, reused or recycled according to legislation ✓ Plant, tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and standard ✓ work practices.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training

		records. In this regard, “TR-Trainer Report” or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Other Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-13: Install and fit off sanitary fixtures

Unit No	13
Unit Title	Install and fit off sanitary fixtures
Unit Code	CONS08CR06V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Plan system layout							
Site inspection is undertaken to determine job requirements	✓		✓	✓	✓		✓
Quantity, location and type of fixtures are determined from design drawings, plans and elevations and other relevant information	✓	✓		✓	✓	✓	
Layout of sanitary plumbing system is planned according to plans and relevant Maldivian standards	✓	✓	✓		✓	✓	✓
Materials and fixtures required are determined from proposed design	✓		✓	✓	✓		✓
2. Identify installation requirements							
Position of sanitary fixtures is determined in accordance with plans, specifications and site requirements	✓		✓	✓	✓		✓
Quantity and type of materials, including pipe materials required, are calculated from design drawings and specifications	✓	✓		✓	✓	✓	
Materials and equipment are identified, ordered and collected in accordance with workplace procedures	✓	✓	✓		✓	✓	✓
Materials and equipment are checked for compliance	✓		✓	✓	✓		✓
3. Install and fit off sanitary fixtures							
Set out is checked for compliance with design drawings	✓		✓	✓	✓		✓
Fixtures are positioned and installed to comply with plans, specifications and manufacturer requirements	✓	✓		✓	✓	✓	
Fixtures, components and pipework are assembled, installed and tested	✓	✓	✓		✓	✓	✓
Fixtures are installed and connected without damage or distortion to fixture, pipework, surrounding environment or other services	✓		✓	✓	✓		✓

Completed installation is checked for correct functioning and compliance with specifications	✓		✓	✓	✓		✓
4. Identify joining requirements							
Joining materials are selected to comply with plans and specifications	✓		✓	✓	✓		✓
Sealants, fixing materials and sheet metal materials are checked for compatibility and are appropriate for the job	✓	✓		✓	✓	✓	
5. Install and test pipe system							
Pipe system is set out to comply with plans, specifications and relevant Maldivian standards	✓		✓	✓	✓		✓
Fixings and supports are installed to manufacturer recommendations, job plans and specifications, and relevant Maldivian standards	✓	✓		✓	✓	✓	
Pipes are installed and jointed according to relevant Maldivian standards, without damage or distortion to pipework, surrounding environment and other services	✓	✓	✓		✓	✓	✓
Pipe system is tested to comply with relevant Maldivian standards and adjusted	✓		✓	✓	✓		✓

Note:

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

#	Question	Answer
1	What is typically included in a system layout when planning?	<ul style="list-style-type: none"> ✓ Water supply lines ✓ Drains ✓ Vent pipes ✓ Valves ✓ Fixtures such as toilets and sinks
2	What will you require when planning a system layout?	<ul style="list-style-type: none"> ✓ Gridded straightedge ✓ Color pencils ✓ Eraser ✓ 30-60-30 -degree triangle ✓ Grid paper
3	What should you first do when making a plumbing plan?	Draw all fixtures to scale size and mark drain lines and vents for fixtures.
4	What should be marked on a plumbing plan?	<ul style="list-style-type: none"> ✓ Drain lines ✓ Vents for fixtures ✓ Supply lines ✓ Vertical pipe runs ✓ Pipe sizes ✓ Valve locations ✓ Stops at fixtures

5	What are the elements of a successful plumbing plan?	<ul style="list-style-type: none"> ✓ Key coding ✓ DWV Elevation ✓ Supply drawing
6	Briefly explain key coding.	It's a good idea to code your map to keep the different elements straight. Show drainpipes with solid lines and supply lines with broken lines. Indicate vertical runs with notes on the overhead view. Mark hot and cold supply lines with colored pencils and color-code drains and vents. Point to pipe sizes with a curved leader line to avoid mistaking the leader for a pipe. You might need to draw several versions of the plumbing plan before you get all the details right.
7	What does DWV stand for?	Drain-waste-vent.
8	Briefly explain what material take off is.	Before a vendor can bid for or begin a construction project, they have to know the types and quantities of the various materials required to complete it. This is to ensure a proper estimate of the costs and material requirements, and also to provide an indication of the labor costs associated with the installation or construction of the materials.
9	What should the takeoff document include?	<p>The material takeoff document must have a list of all the materials required to complete the project, no matter what it is. This does not include any assets, such as equipment and tools that will also be required to complete the job but should include any and all raw and prefabricated tools, such as timber, sand, concrete, bricks, electrical cables, light fixtures, and plumbing pipes.</p> <p>After listing the building materials, the MTO needs to specify the type of material, such as the type of electrical cable or specific grades of steel.</p>
10	Identify the key types of measurement required.	<ul style="list-style-type: none"> ✓ Count ✓ Length ✓ Area ✓ Volume
11	What are the types of material takeoffs?	<ul style="list-style-type: none"> ✓ Manual takeoffs ✓ Digital takeoffs
12	Briefly explain manual takeoffs.	<p>This type makes use of traditional paper blueprints and plans. For this to work, the estimator needs to be able to accurately read the materials for the type of work quantified, whether it's general architectural drawings, an electrical schematic, a plumbing schematic, or something else. In addition to the diagrammatic representation of the project, the documents will contain symbols and notes that may indicate the type of required materials.</p> <p>Work from these plans with colored pens, pencils, or markers so you can distinguish between all the items and types of materials. You can transfer the materials and quantities to spreadsheets or forms and worksheets you can use to work out the exact material costs for each component.</p> <p>Because paper blueprints can be pricey to produce, you may be required to use a clear plastic overlay instead of marking</p>

		<p>directly on the blueprint. As such, many estimators are making use of new technology to perform estimates digitally.</p> <p>In the case of engineering projects, you may not be using blueprints, but a design document.</p>
13	Briefly explain digital takeoffs.	<p>It's possible to use manual takeoffs to get an accurate estimate, but they can be labor intensive and complex. It can also cause errors if you get a measurement, calculation, or count wrong.</p> <p>As more companies are producing digital blueprints, and there is available software to partially automate and streamline the takeoff process, many estimators are opting for a digital takeoff instead.</p> <p>Though there are different specifications for the different software applications, all of them allow you to analyze a set of blueprints and enter the measurements and quantities. Some systems integrate with a quotation or bidding program so you can easily combine the two processes.</p>
14	List the steps in the takeoff process.	<ol style="list-style-type: none"> 1. Count the symbols 2. Measure the circuits 3. Calculate the takeoff
15	Explain how to count the symbols.	<p>You must count the symbols to determine the number of components needed to complete the job. The drawings and blueprints you're working from will use standardized symbols to identify various elements such as switches, receptacles, and fixtures. Familiarize yourself with the symbols and what they mean. Non-standard components are generally identified with a key that's included with the drawings.</p> <p>Count each type of component individually. If you're doing this manually, you can use a tally counter that you click to add a unit. Though it helps to ensure accuracy, it can be time-consuming and tedious. You'll need to mark the symbols somehow to indicate that you've counted it, so you don't count it again. As you complete the count for a component, enter the quantity on the working scope sheet, and repeat until you've worked through all pages of the blueprint and all the symbols. Then, add the totals for all the different components.</p>
16	Explain how to measure the circuits.	<p>You must also measure the circuits shown in the drawings. Before you begin, check the scale used for all the pages you measure. The scale dimensions are usually listed in the title of the drawing, but the scale may vary from page to page.</p> <p>If you're not working from original blueprints, they may have been copied at a reduced size, so you must make sure the scale is accurate. If you doubt the information in front of you, it's best to contact the designers or architect to be sure.</p> <p>You'll want to have an architectural rule, mechanical and electronic measuring wheels, and scaled measuring tapes available. You can use the ruler and measuring tapes for quick measurements in small dimensions but using the measuring wheel is both accurate and convenient.</p> <p>Measure the branch circuit for each component in the drawing and allow and add in drops at each of the switches. Some wheel devices allow you to program a set distance for drops and then press a key to add the distance. If the drops are standardized,</p>

		<p>this works, but if they are different sizes, you'll need to reset it each time.</p> <p>It's possible there will be different circuits (two, three, or four-wire) on the same drawing. Trace each circuit with a colored pen after you've finished measuring and use the same color for the same type of circuit – such as red for two wire, green for three wire, and blue for four wire.</p>
17	Explain how to calculate the takeoff.	Using the counts and measurements you came up with in the two previous steps, you can produce your takeoff figure. You should build in a small cushion for price fluctuations, and with this you can provide a fairly accurate cost of the materials involved in any given construction or engineering project. If you have the right time and motion data, you can also estimate the scale of the job to project labor costs and other expenses associated with the project.
18	List four types of plumbing fittings.	<ul style="list-style-type: none"> ✓ Collar ✓ Elbow ✓ Gasket ✓ Union ✓ Reducer ✓ Tee ✓ Nipple ✓ Trap
19	List five joining materials.	<ul style="list-style-type: none"> ✓ Collar ✓ Elbow ✓ Gasket ✓ Union ✓ Reducer ✓ Tee ✓ Nipple ✓ Cross ✓ Offset
20	List five types of sanitary fixtures.	<ul style="list-style-type: none"> ✓ Bathtub ✓ Washbasin ✓ Water closet ✓ Faucet ✓ Sink ✓ Flushing cistern ✓ Geysers
21	What are some important points that should be considered before installation?	<ul style="list-style-type: none"> ✓ Read the plumbing drawing ✓ Install the basic sanitary fixture ✓ Protection against backflow ✓ Access for cleaning ✓ Check for alignment ✓ Make floor and wall drainage connections ✓ Check for floor flanges ✓ Secure floor outlet fixtures ✓ Secure wall-hung water closet bowls

		<ul style="list-style-type: none"> ✓ Make water-tight joints ✓ Plumbing in mental health centres ✓ Design of overflows ✓ Connection of overflows ✓ Access to concealed connections
22	List the steps to installing a wall hung fixture.	<p>Step 1. Install the mounting board between the studs at the proper height, using the same method as for a wall-hung flush tank.</p> <p>Step 2. Attach a hanger bracket on the finished wall using the proper length of wood screws at the recommended height. The metal bracket must be level.</p> <p>Step 3. Place the lavatory on the bracket and push down. Make sure the lavatory is level.</p>

2. PT=Practical Test

#	Practical Activity	Additional details related to the activity
1	Student Assignments	Students need to undertake assignments related to installing and fitting off sanitary fixtures, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	<p>Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas.</p> <ul style="list-style-type: none"> ✓ Plan system layout ✓ Identify installation requirements ✓ Install and fit off sanitary fixtures ✓ Identify joining requirements ✓ Install and test pipe system
3	Review Assessment papers	<p>Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following.</p> <ul style="list-style-type: none"> ✓ Plan system layout ✓ Identify installation requirements ✓ Install and fit off sanitary fixtures ✓ Identify joining requirements ✓ Install and test pipe system
4	Demonstrate how to accurately use tees	<p>The student is expected to follow the correct step-by step process to using tees. The elements which should be assessed are:</p> <ul style="list-style-type: none"> ✓ Tees connect pipes of various diameters and help in changing the direction of water or material in a pipe

3. OW =Observation at work Place

#	Activity to observe	Additional details
1	Assessment papers	<p>While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.</p> <ul style="list-style-type: none"> ✓ Plan system layout ✓ Identify installation requirements ✓ Install and fit off sanitary fixtures ✓ Identify joining requirements ✓ Install and test pipe system
2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to installation of sanitary plumbing, including the connection of discharge pipes to sanitary plumbing and drainage, including soil and waste fixtures.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	<p>Demonstrate how to accurately install and fit the following sanitary fixtures:</p> <ol style="list-style-type: none"> a. Water closet b. Flushing cistern c. Sink 	As the students attend the practical test to check their skill in installing sanitary fixtures, make sure the student uses the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Answers
1	Plan system layout	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Site inspection is undertaken to determine job requirements ✓ Quantity, location and type of fixtures are determined from design drawings, plans and elevations and other relevant information. ✓ Layout of sanitary plumbing system is planned according to plans and relevant Maldivian standards. ✓ Materials and fixtures required are determined from proposed design.

2	Identify installation requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Position of sanitary fixtures is determined in accordance with plans, specifications and site requirements. ✓ Quantity and type of materials, including pipe materials required, are calculated from design drawings and specifications. ✓ Materials and equipment are identified, ordered and collected in accordance with workplace procedures. ✓ Materials and equipment are checked for compliance
3	Install and fit off sanitary fixtures	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Set out is checked for compliance with design drawings. ✓ Fixtures are positioned and installed to comply with plans, specifications and manufacturer requirements. ✓ Fixtures, components and pipework are assembled, installed and tested ✓ Fixtures are installed and connected without damage or distortion to fixture, pipework, surrounding environment or other services. ✓ Completed installation is checked for correct functioning and compliance with specifications
4	Identify joining requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Joining materials are selected to comply with plans and specifications. ✓ Sealants, fixing materials and sheet metal materials are checked for compatibility and are appropriate for the job.
5	Install and test pipe system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Pipe system is set out to comply with plans, specifications and relevant Maldivian standards. ✓ Fixings and supports are installed to manufacturer recommendations, job plans and specifications, and relevant Maldivian standards. ✓ Pipes are installed and jointed according to relevant Maldivian standards, without damage or distortion to pipework, surrounding environment and other services. ✓ Pipe system is tested to comply with relevant Maldivian standards and adjusted

5. TRB/LB =Trainee’s Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee’s Record/Log Book	As training progresses, students need to be given “Trainee’s Record Book” or “Log Book”. Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, “TR-Trainer Report” or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc. Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.

Unit-14: Locate clear blockages and fix leaks

Unit No 14
 Unit Title Locate clear blockages and fix leaks
 Unit Code CONS08CR07V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Prepare for work							
Plans and specifications are obtained from job supervisor	✓		✓	✓	✓		✓
Work health and safety (WHS) and environmental requirements associated with locating and clearing blockages are adhered to throughout the work	✓	✓		✓	✓	✓	
Quality assurance requirements are identified and adhered to in accordance with workplace requirements	✓	✓	✓		✓	✓	✓
Tasks are planned and sequenced in conjunction with others involved in or affected by the work	✓		✓	✓	✓		✓
Tools and equipment, including personal protective equipment, are selected and checked for serviceability	✓		✓	✓	✓		✓
Work area is prepared to support efficient locating and clearing of blockage	✓	✓		✓	✓	✓	
2. Locate and clear blockage							
Section containing blockage is located and isolated and its material identified	✓		✓	✓	✓		✓
Blockage clearing equipment is selected according to the job	✓	✓		✓	✓	✓	
Where necessary, mechanical drain clearing equipment is assembled and used according to manufacturer instructions	✓	✓	✓		✓	✓	✓
Blockage is cleared without causing damage to pipework and fittings	✓		✓	✓	✓		✓
Pipework is tested to confirm blockage is cleared from pipe system	✓		✓	✓	✓		✓
Where required, authorities are advised of work completion	✓	✓		✓	✓	✓	
Sustainability principles and concepts are applied throughout the locating and clearing process	✓	✓	✓		✓	✓	✓
3. Clean up							

Work area is cleared and materials disposed of, reused or recycled according to legislation, regulations, codes of practice and job	✓		✓	✓	✓		✓
Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures	✓	✓		✓	✓	✓	
Information is accessed and documentation completed according to workplace requirements	✓	✓	✓		✓	✓	✓

Note:

✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies, FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

#	Question	Answer
1	What are some of the factors that contribute to leakage?	<ul style="list-style-type: none"> ✓ old or poorly constructed pipelines ✓ inadequate corrosion protection ✓ poorly maintained valves ✓ mechanical damage
2	What are some ways that cost effect loss control measures that will minimize distribution system water losses can be implemented?	Water systems with pressurized distribution systems should promote water auditing, leak detection, and leak repair as a means to reduce operating costs and conserve water. The water audit can be used on systems with customer meters, while leak detection and repair can be used on any pressurized water system. The difference between produced water and the total of metered use and authorized non-metered use estimates is an indicator of the severity of unauthorized use problems or system water leaks.
3	What are some benefits from minimizing leakage in water systems?	<ul style="list-style-type: none"> ✓ Improved operational efficiency. ✓ Lowered water system operational costs. ✓ Reduced potential for contamination. ✓ Extended life of facilities. ✓ Reduced potential property damage and water system liability. ✓ Reduced water outage events. ✓ Improved public relations.
4	What are some benefits that are difficult to quantify?	<ul style="list-style-type: none"> ✓ increased knowledge about the distribution system, which can be used to respond more quickly to emergencies and set priorities for replacement or rehabilitation programs; ✓ more efficient use of existing supplies and delayed capacity expansion ✓ increased firefighting capability.
5	What important water system activities can take place due to leak	<ul style="list-style-type: none"> ✓ inspecting hydrants and valves in a distribution system; ✓ updating distribution system maps;

	detection and repair programs?	<ul style="list-style-type: none"> ✓ using remote sensor and telemetry technologies for ongoing monitoring and analysis of source, transmission, and distribution facilities. Remote sensors and monitoring software can alert operators to leaks, fluctuations in pressure, problems with equipment integrity, and other concerns; and ✓ inspecting pipes, cleaning, lining, and other maintenance efforts to improve the distribution system and prevent leaks and ruptures from occurring. Systems might also consider methods for minimizing water used in routine water system maintenance.
6	Identify three types of leaks.	<ul style="list-style-type: none"> ✓ Service line leaks ✓ Valve leaks ✓ Supply line leaks
7	Identify three possible causes of leaks.	<ul style="list-style-type: none"> ✓ Material ✓ Composition ✓ Age ✓ Joining methods of distribution system components ✓ Quality of initial installation ✓ Water conditions such as temperature, pressure ✓ Stray electric current ✓ Stress from traffic vibrations
8	List five signs of underground leaks.	<ul style="list-style-type: none"> ✓ Unusually wet spots in landscaped areas and/or water pooling on the ground surface. ✓ An area that is green, moldy, soft, or mossy surrounded by drier conditions. ✓ A notable drop in water pressure/flow volume. ✓ A sudden problem with rusty water or dirt or air in the water supply (there are other causes for this besides a leak). ✓ A portion of an irrigated area is suddenly brown/dead/dying when it used to be thriving (water pressure is too low to enable distant heads to pop up properly). ✓ Heaving or cracking of paved areas. ✓ Sink holes or potholes. ✓ Uneven floor grade or leaning of a structure. ✓ Unexplained sudden increase in water use, consistently high water use, or water use that has been climbing at a fairly steady rate for several billing cycles.
9	Briefly describe active leak detection.	<p>Active leak detection is crucial in identifying unreported water leakage and losses in the distribution system. Finding and repairing water losses through an active leak detection program will reduce water loss and, in many cases, save substantial money. Without a leak detection program, leaks may only be found when they become visible at the surface, or when major infrastructure collapses. Active leak control will reduce expensive emergency overtime repairs and the associated liability costs. The impact on customers is also greater in emergency repair situations as is the possible impact on other</p>

		infrastructure (roads, sewers, utilities) and on the environment due to possible discharges of chlorinated water. Detecting leaks is only the first step in eliminating leakage. Leak repair is the more costly step in the process. On average, the savings in water no longer lost to leakage outweigh the cost of leak detection and repair.
10	What is used to detect leaks?	Sonic leak-detection equipment and correlator devices.
11	Why are small leaks easier to detect?	Many small leaks are easier to detect because they are noisier and easier to hear using hydrophones.
12	Identify three ways in which you can identify leaks.	<ul style="list-style-type: none"> ✓ Inspect irrigation systems for obvious above ground leaks. Extremely wet areas above an underground pipe can be an indication of a broken pipe or joint. ✓ Examine equipment routinely and look at exposed pipes to see if you can visually see any leaking water. ✓ Compare your records with the same month of previous years. While the amount of water used will vary due to weather and processes, look for sharp increases in your consumption that could indicate a leak.
13	Identify two types of technology used to detect leaks.	<ul style="list-style-type: none"> ✓ Drones and satellites ✓ Acoustic and pressure loggers
14	Explain drones and satellites.	Drones and satellites can inspect large areas of our network, surveying the surface for changes in ground conditions, including a change in colour of vegetation. They can also check chlorine levels and reach areas of our network that are hard to access, and relay information back to our experts.
15	Explain acoustic and pressure loggers.	<p>Acoustic loggers are a major part of our leak detection technology. They pick up vibrations from a leak when they're attached to a pipe. Those vibrations are reviewed by our technicians who can use that information to find a leak.</p> <p>We often use these at night, when the network is at its quietest and there is less background noise. The loggers listen out for the distinctive sound patterns that escaping water produces.</p> <p>We also have pressure loggers, permanently assessing the pressure levels in our pipes. These are able to detect changes in flow and pressure. If there is an unexpected drop in pressure, that suggests there may be a leak.</p> <p>By placing one of these loggers at either end of a section of pipe that we are investigating, we can use the data they collect to triangulate the position of the leak.</p> <p>We're then able to tell if the issue is on our network or on private pipework. If it's on our network, the data helps us to make sure we dig in the right place so we can get to work fixing it quickly. If the leak is on private pipework, we'll make sure we inform the tenant or homeowner so they know what to do next.</p>
16	Briefly describe how to find plumbing leaks in the tub and shower.	<p>Signs of trouble:</p> <ul style="list-style-type: none"> ☒ Curling vinyl flooring or loose tiles next to the tub. ☒ Peeling paint or flaking, chalky-looking wood finish near the shower. ☒ Water stains on the ceiling or joists below.

		<ul style="list-style-type: none"> ☒ Mold spots on the wall or floor near the tub or shower. ☒ If you use a curtain, look for standing water on the floor after you shower. <p>How to find the source of a bathtub drain leaking:</p> <ul style="list-style-type: none"> ☒ If you have a shower door, splash water all around the door and frame. Leaks around the frame may take five minutes or longer to show up. ☒ If the door has rubber gaskets or a rubber door sweep, check them for gaps. ☒ Also check for any gaps in the caulk where the shower or tub meets the flooring.
17	Briefly describe how to fix a leaking tub drain.	<ul style="list-style-type: none"> ✓ Signs of trouble: ✓ Curling vinyl flooring or loose tiles next to the tub. ✓ Peeling paint or flaking, chalky-looking wood finish near the shower. ✓ Water stains on the ceiling or joists below. ✓ Mold spots on the wall or floor near the tub or shower. ✓ If you use a curtain, look for standing water on the floor after you shower.
18	Identify signs of trouble with bathtub drain leaking.	<ul style="list-style-type: none"> ✓ Signs of trouble: ✓ Curling vinyl flooring or loose tiles next to the tub. ✓ Peeling paint or flaking, chalky-looking wood finish near the shower. ✓ Water stains on the ceiling or joists below. ✓ Mold spots on the wall or floor near the tub or shower. ✓ If you use a curtain, look for standing water on the floor after you shower.
19	Explain how to find the source of a leaking tub drain.	<ul style="list-style-type: none"> ✓ Signs of trouble: ✓ Curling vinyl flooring or loose tiles next to the tub. ✓ Peeling paint or flaking, chalky-looking wood finish near the shower. ✓ Water stains on the ceiling or joists below. ✓ Mold spots on the wall or floor near the tub or shower. ✓ If you use a curtain, look for standing water on the floor after you shower.
20	Explain how to fix a bathtub drain leaking.	<ul style="list-style-type: none"> ✓ Signs of trouble: ✓ Curling vinyl flooring or loose tiles next to the tub. ✓ Peeling paint or flaking, chalky-looking wood finish near the shower. ✓ Water stains on the ceiling or joists below. ✓ Mold spots on the wall or floor near the tub or shower. ✓ If you use a curtain, look for standing water on the floor after you shower.
21	Identify signs of trouble with sink rim leaks.	<ul style="list-style-type: none"> ✓ ☒ Puddles, dampness or water stains inside the cabinet. ✓ ☒ Loose plastic laminate near sink. ✓ ☒ A loose faucet base. ✓ ☒ Deteriorating caulk around sink

22	Explain how to find the source of a sink rim leak.	<ul style="list-style-type: none"> ✓ ☐ If you have a plastic laminate countertop, examine the underside of the countertop using a flashlight. Look for swollen particleboard or other signs of water damage. ✓ ☐ Dribble water around the sink rim and look for leaks
23	Explain how to fix a sink rim leak.	<ul style="list-style-type: none"> ✓ ☐ Tighten the faucet base by turning the mounting nuts underneath it. ✓ ☐ If the sink rim is caulked, scrape away the old caulk and recaulk. ✓ ☐ Tighten the clips under the sink rim that clamp the sink to the countertop.
24	Identify four tools needed to unclog a drain and explain why.	<ul style="list-style-type: none"> ✓ ☐ The first tool to reach for when trouble arises is a plunger. This plumber's friend clears clogs from most fixtures, including sinks, tubs and toilets. Every homeowner should keep one handy. ✓ ☐ To dislodge clogs located farther down the drainpipe, use a cable auger, or plumber's snake, a long, flexible steel cable wound around a spool that's fitted with a hand crank. Cable augers are available in lengths up to 100 feet, though a 25-foot model will suffice for most any household clog. ✓ ☐ A closet auger is specifically made for snaking out toilets. It, too, is equipped with a hand crank, but instead of a spool, the cable is encased in a rigid shaft. The auger end is bent at a precise angle to fit through the tight curves of a toilet trap. ✓ ☐ For a very large clog or one that's far from the fixture, rent an electric power auger. This machine—basically a large cable auger powered by an electric motor—is very effective at cutting through virtually any clog, even tangled tree roots. Before bringing home a power auger, be sure the rental agent shows you how to safely dispense and retrieve the cable.

2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to locating and clearing blockages, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	<p>Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Locate and clear blockage ✓ Clean up
3	Review Assessment papers	Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following.

		<ul style="list-style-type: none"> ✓ Prepare for work ✓ Locate and clear blockage ✓ Clean up
4	Demonstrate how to properly investigate for leaks	<p>The student is expected to follow the correct step-by step process to investigating leaks. The elements which should be assessed are:</p> <ul style="list-style-type: none"> ✓ Inspect irrigation systems for obvious above ground leaks. Extremely wet areas above an underground pipe can be an indication of a broken pipe or joint. ✓ Examine equipment routinely and look at exposed pipes to see if you can visually see any leaking water. ✓ Compare your records with the same month of previous years. While the amount of water used will vary due to weather and processes, look for sharp increases in your consumption that could indicate a leak.

3. OW =Observation at work Place

#	Questions	Answers
1	Assessment papers	<p>While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Locate and clear blockage ✓ Clean up
2	Log Books	<p>Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.</p>
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to plumbing.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Demonstrate how to find and repair hidden plumbing leaks and blockage	<p>As the students attend the practical test to assess their skill in finding leaks and repairing them, make sure the student use the proper techniques and the information he shared is accurate.</p>

4. OQ=Oral Questioning

#	Questions	Answers
1	Prepare for work	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Plans and specifications are obtained from job supervisor. ✓ Work health and safety (WHS) and environmental requirements associated with locating and clearing blockages are adhered to throughout the work. ✓ Quality assurance requirements are identified and adhered to in accordance with workplace requirements. ✓ Tasks are planned and sequenced in conjunction with others involved in or affected by the work. ✓ Tools and equipment, including personal protective equipment, are selected and checked for serviceability. ✓ Work area is prepared to support efficient locating and clearing of blockage.
2	Locate and clear blockage	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Section containing blockage is located and isolated and its material identified. ✓ Blockage clearing equipment is selected according to the job. ✓ Where necessary, mechanical drain clearing equipment is assembled and used according to manufacturer instructions. ✓ Blockage is cleared without causing damage to pipework and fittings. ✓ Pipework is tested to confirm blockage is cleared from pipe system. ✓ Where required, authorities are advised of work completion. ✓ Sustainability principles and concepts are applied throughout the locating and clearing process.
3	Clean up	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work area is cleared and materials disposed of, reused or recycled according to legislation, regulations, codes of practice and job. ✓ Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures. ✓ Information is accessed and documentation completed according to workplace requirements.

5. TRB/LB =Trainee’s Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee’s Record/Log Book	As training progresses, students need to be given “Trainee’s Record Book” or “Log Book”. Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, “TR-Trainer Report” or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc. Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.

Unit-15: Install below ground domestic waste water

Unit No 15
 Unit Title Install below ground domestic waste water
 Unit Code TOUS04CR15V2/20

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Prepare for work							
Plans and specifications are obtained	✓		✓	✓	✓		✓
Work health and safety, quality and environmental requirements analyzed	✓	✓		✓	✓	✓	
Tasks are planned and sequenced in conjunction with others involved in or affected by the work	✓	✓	✓		✓	✓	✓
Tools and equipment, including personal protective equipment, are selected and checked for serviceability	✓		✓	✓	✓		✓
Location of underground services is identified	✓		✓	✓	✓		✓
Work area is prepared to support efficient installation of sanitary drainage systems	✓	✓		✓	✓	✓	
2. Identify installation requirements							
Quantity and type of materials required are calculated from existing plans	✓		✓	✓	✓		✓
Materials and equipment are identified, ordered and collected	✓	✓		✓	✓	✓	
Materials and equipment are checked for compliance	✓	✓	✓		✓	✓	✓
Sustainability principles and concepts are applied throughout the installation process	✓		✓	✓	✓		✓
3. Install sanitary drainage systems							
Pipework is set out according to plans and specifications, site requirements or job instructions	✓		✓	✓	✓		✓
Pipework is installed according to plans, specifications, standards and workplace procedures	✓	✓		✓	✓	✓	
Connections for alterations, additions or repairs to existing systems are made according to standards and manufacturer specifications	✓	✓	✓		✓	✓	✓

Installation is checked for compliance with design drawings, specifications, site requirements, standards and authorities' requirements	✓		✓	✓	✓		✓
Installation is tested to comply with standards and relevant authorities' requirements	✓		✓	✓	✓		✓
4. Develop catch pit and oil trap to the guidelines provided by sewerage service providers							
Obtain drawing and measurements for catch pit from the service provider	✓		✓	✓	✓		✓
Arrange the materials to develop the catch pit	✓	✓		✓	✓	✓	
Develop the catch pit to industry standard	✓	✓	✓		✓	✓	✓
5. Clean up							
Installation is backfilled according to standards, and work area is cleared and materials handled	✓		✓	✓	✓		✓
Tools and equipment are cleaned, checked, maintained and stored	✓	✓		✓	✓	✓	
Information is accessed and documentation completed	✓	✓	✓		✓	✓	✓

Note:

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

	Question	Answer
1	Listen four things to consider before you start the operation.	<ul style="list-style-type: none"> ✓ The site ✓ The weather ✓ Traffic ✓ Hazards ✓ The task ✓ Plant ✓ Attachments ✓ Communications ✓ Procedures and rules
2	What does excavation work generally involve?	✓ Excavation work generally means work involving the removal of soil or rock from a site to form an open face, hole or cavity, using excavators.
3	What is an excavator?	✓ An excavator is a self-propelled vehicle (either crawler or wheeled) with an upper structure, which can rotate 360 degrees. It can excavate, then swing and discharge materials.
4	Identify seven types of measuring and layout tools used by a plumber.	<ul style="list-style-type: none"> ✓ Tapes ✓ Rules ✓ Squares ✓ Alignment tools

5	What does a builder's level consist of?	<ul style="list-style-type: none"> ✓ Telescope ✓ Graduated leveling vial ✓ Graduated horizontal circle ✓ Leveling screws ✓ Focusing knob ✓ Base ✓ Eyepiece ✓ Horizontal clamp screw ✓ Horizontal tangent screw ✓ Vernier scale
6	List the equipment normally used by a plumber.	<ul style="list-style-type: none"> ✓ Bench vice ✓ Pipe vice ✓ Pipe wrench ✓ Chain wrench ✓ Pipe cutter ✓ Hacksaw ✓ Spanner ✓ Plier ✓ Screwdriver ✓ Hammer ✓ Files ✓ Drills
7	Explain the function of a pipe wrench.	<ul style="list-style-type: none"> ✓ One of the first tools people associate with plumbing is the pipe wrench. It's adjustable and has lots of play in the grip. Its teeth face inward. Plumber probably won't even have to lift it off the pipe he is turning. Normally, he shall need two pipe wrenches: one to hold the pipe steady and a second to remove the nut or other attachment. The pipe wrench is an adjustable wrench used for turning iron pipes and fittings with a rounded surface. The design of the adjustable jaw allows it to rock in the frame, such that any forward pressure on the handle tends to pull the jaws tighter together.
8	Explain the function of a hacksaw.	<ul style="list-style-type: none"> ✓ Many hacksaws have a two-part adjustable frame and a pistol grip handle. Hacksaws are used by plumbers to cut pipes and occasionally by electricians to cut conduit. The hacksaw got its name because historically these saws did not cut smoothly.
9	Explain the function of a spanner.	<ul style="list-style-type: none"> ✓ Spanners: Spanners are used for fixing and opening nuts and bolts. Different types of spanners are available such as double ended spanner, ring spanners, socket spanners. The material used are Chrome Vanadium Steel / Carbon Steel. Spanners are available in set of different sizes.
10	Explain the function of a drill machine.	<ul style="list-style-type: none"> ✓ A drill is a tool with a rotating drill bit used for drilling holes in various materials. The drill bit is gripped by a chuck at one end of the drill, and is pressed against the target

		material and rotated. The tip of the drill bit does the work of cutting into the target material, either slicing off thin shavings. Plumbers normally use hand operated drilling machine for drilling holes. All sizes of drill bits are available depending upon the size of hole to be drilled.
11	What should be considered when calculating quantity and type of materials required?	<ul style="list-style-type: none"> ✓ Determine area of the building ✓ Count and determine how many water fixtures are there in the drawing ✓ Determine how much excavations are involved ✓ Determine quantity and type of plumbing materials to be used ✓ Preparation of a detailed plumbing estimate compiled and submitted
12	Identify three ways in which plumbers play an important role in delivering sustainable housing.	<ul style="list-style-type: none"> ✓ ☐install water-efficient fixtures and appliances, which reduces the amount of water and energy used and water disposed of down the drain; ✓ ☐support water reuse and rainwater harvesting (where permitted), which can offset some of the treated municipal water used by a home and ease the strain on treatment plants and water sources; ✓ ☐use high-quality and durable parts to reduce the need for frequent replacement and cut down on wasted materials; and ✓ ☐provide homeowners with a calculation of utility cost savings associated with green features, including how long it will take to recover the cost of a high-efficiency fixture or appliance.
13	Explain in detail how to set out pipework.	<ul style="list-style-type: none"> ✓ 1.Lengths of the drainage pipe that flows between the sanitary fixtures are measured and pipes are cut accordingly. ✓ 2.Measure and cut branch drains in the same sequence. ✓ 3.Connections, gullies and other accessories at the heads of the branch drains, linking up with the work previously measured are located and placed close the point of connection. ✓ 4.Pipe support mechanism such as pipe clips and other fastening devices are identified and closely located with screws. ✓ 5.Measurements need to include all the drainage pipes up to the catch pit located within the boundary of the dwelling
14	Identify the steps taken to install pipework.	<ul style="list-style-type: none"> ✓ 1 Cut the pipe ✓ 2 Deburr and fit ✓ 3 Clean and cement ✓ 4 Install pipe hangers
15	Explain in detail how to install pipework.	<ul style="list-style-type: none"> ✓ ☐Step 1: Cut the pipe

		<ul style="list-style-type: none"> ✓ PVC pipe can be easily cut with an appropriate pipe-cutting tool. ✓ ☒Step 2: Deburr and fit ✓ After cutting, clean shavings out of the pipe and smooth out the ragged edges (a process called deburring). Position the cut pipe with the proper PVC fittings in place to ensure the length is correct. ✓ ☒Step 3: Clean and cement ✓ Clean the PVC pipe with an all-purpose pipe cleaner called a primer. Swab the primer around the inside of the pipe and the inside of the fitting. A special cement is used to hold the joint pieces of the pipe together. Coat the inner surface of the joint with cement and insert the PVC pipe. Make sure the glue has covered the entire joint. ✓ ☒Step 4: Install pipe hangers ✓ Install pipe hangers to support the pipe and to ease stress on the joints. Follow recommendations from the distances from hanger to hanger, approximately every 4' (1.21 m). Protect the pipe from nails, screws and other abrasive materials.
16	Identify two ways in which installation is tested.	<ul style="list-style-type: none"> ✓ Water testing ✓ Air testing
17	Explain water testing.	<p>All sections of the installation should be sealed off and water introduced through a stand pipe to provide a static head of 3 metres above the top point in the PVC pipeline. All openings in the pipeline must be sealed, or plugged, before starting testing. A riser pipe should be fitted at the top point in the pipeline to allow a minimum water head of 1 meter at this point and a maximum of 5 metres at the lowest point to be applied.</p> <p>The test water should be introduced evenly into the pipeline and brought up to pressure after allowing all entrapped air to be purged out of the line. The test pressure should be maintained for a minimum period of 15 minutes and all joints and connections should be inspected for leakage. Any defects detected should be repaired and the pipeline retested.</p>
18	Explain air testing.	<p>Where water is unavailable, or undesirable, for testing then air testing may be performed. All openings must be sealed prior to testing, and air pumped slowly into the pipeline until a test pressure of 50KPa is reached. This test pressure should be maintained for a minimum time of 3 minutes, and if no leaks are detected, or pressure loss observed on the gauge, the air supply control valve should be turned off and the test pressure held for a minimum time of 1 minute. If the test gauge pressure reading has not fallen below 35KPa after this time, then the test should be discontinued.</p> <p>Should the test pressure drop below 35KPa after 1 minute, then the pressure should be returned to 50KPa and maintained until</p>

		<p>a full inspection of the pipeline has been completed. All joints and connections need to be individually inspected for leakage using a solution of water and detergent poured over any suspect joint. If a leak is present, it will cause the detergent solution to bubble, and foam.</p>
19	Explain in detail establishing catch pit.	<p>Catch pit remains as the last point of below ground domestic drainage system normally located within the boundary of the home within which the drainage pipelines are being installed.</p> <p>A catch pit is typical crafted from masonry. This masonry could be brick, concrete block or concrete rings. It is constructed deep enough to be lower than the bottom of the sewer system in the street, by a few feet. There are at least two pipes installed through the walls of the basin. One pipe is the inlet pipe from the home and the other is the outlet pipe toward the sewer. There may be other pipes as well. The idea is; the laundry, floor drains, and kitchen sinks are the most likely origin of the contaminated water and would discharge through the catch basin. When the discharge enters the catch basin it would naturally separate. The solids would sink to the bottom. The gears scum and soap will float on the top. If the outlet pipe has a small elbow or bend it will only allow “clean” liquid to migrate out to the sewer system.</p>
20	Explain in detail establishing oil pit.	<p>Everyday significant amount of grease and fat enter the sewerage system and they sticks to pipe walls, which can eventually lead to blockages while fats and oils damage waste water treatment equipment, costing municipalities millions in repairs. For these reasons, Utility Service Providers enforce all the food service operators to install oil trap within the boundary of the home. This is particularly important for venues that operate commercial kitchens as waste water from referred entities are causing blockages in internal pipes leading to expensive repairs and potential equipment downtime. Oil traps work on the basis that animal fats and vegetable oils (grease) are 10 to 15 percent less dense than water and that grease won’t mix with water. Thus, fats and oils float on top of water.</p> <p>When wastewater enters an oil trap, the flow rate is reduced enough so the wastewater is given enough time to cool and separate into 3 layers. The grease rises to the top inside the interceptor and is trapped using a system of baffles. Solids settle at the bottom and the separated clear water escapes under an outlet baffle. Many oil traps also have strainers for collecting solid debris, which reduces the amount of solids that settle at the bottom of the trap.</p> <p>Over time, solids and grease build-up, and if left to accumulate for long enough they can start to escape through the outlet and in some circumstances, they can back-up through the inlet. For this reason, the trap must be cleaned / pumped out on a regular basis.</p>
21	Identify three types that collected waste	<ul style="list-style-type: none"> ✓ Plastic waste ✓ Paper-card waste

	can be broken down into.	<ul style="list-style-type: none"> ✓ Tins and metals ✓ Ceramics and glass
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2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to installing below ground domestic waste water systems. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	<p>Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Identify installation requirements ✓ Install sanitary drainage systems ✓ Develop catch pit and oil trap to the guidelines provided by sewerage service providers ✓ Clean up
3	Review Assessment papers	<p>Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Identify installation requirements ✓ Install sanitary drainage systems ✓ Develop catch pit and oil trap to the guidelines provided by sewerage service providers ✓ Clean up
4	Demonstrate how to properly install the pipework	<p>The student is expected to follow the correct step-by step process of installing pipework. The elements which should be assessed are:</p> <ul style="list-style-type: none"> ✓ Cut the pipe ✓ Deburr and fit ✓ Clean and cement ✓ Install pipe hangers

3. OW =Observation at work Place

#	Questions	Answers
1	Assessment papers	<p>While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.</p> <ul style="list-style-type: none"> ✓ Prepare for work ✓ Identify installation requirements ✓ Install sanitary drainage systems ✓ Develop catch pit and oil trap to the guidelines provided by sewerage service providers

		✓ Clean up
2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	During the implementation of the training program, students would have completed assignments related to installing below ground sanitary drainage systems for sewage and waste discharge from sanitary fixtures to the authorities' approved point of connection. Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.
4	Demonstrate how to accurately identify installation requirements	As the students attend the practical test to assess their skill in identifying installation requirements, make sure the student use the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Answers
1	Prepare for work	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work health and safety, quality and environmental requirements analyzed ✓ Tasks are planned and sequenced in conjunction with others involved in or affected by the work. ✓ Tools and equipment, including personal protective equipment, are selected and checked for serviceability. ✓ Location of underground services is identified. ✓ Work area is prepared to support efficient installation of sanitary drainage systems
2	Identify installation requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Quantity and type of materials required are calculated from existing plans ✓ Materials and equipment are identified, ordered and collected. ✓ Materials and equipment are rechecked for compliance ✓ Sustainability principles and concepts are applied throughout the installation process
3	Install sanitary drainage systems	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Pipework is set out according to plans and specifications, site requirements or job instructions. ✓ Pipework is installed according to plans, specifications, standards and workplace procedures. ✓ Connections for alterations, additions or repairs to existing systems are made according to standards and manufacturer specifications.

		<ul style="list-style-type: none"> ✓ Installation is checked for compliance with design drawings, specifications, site requirements, standards and authorities' requirements. ✓ Installation is tested to comply with standards and relevant authorities' requirements
4	Develop catch pit and oil trap to the guidelines provided by sewerage service providers	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Obtain drawing and measurements for catch pit from the service provider ✓ Arrange the materials to develop the catch pit ✓ Develop the catch pit to industry standard
5	Clean up	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Installation is backfilled according to standards, and work area is cleared and materials handled ✓ Tools and equipment are cleaned, checked, maintained and stored. ✓ Information is accessed and documentation completed.

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-16: Fabricate and install roof drainage components

Unit No	16
Unit Title	Fabricate and install roof drainage components
Unit Code	CONS08CR09V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW = Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Prepare for work							
Plans and specifications are obtained and confirmed	✓	✓		✓	✓	✓	
Tasks are planned and sequenced	✓		✓		✓		✓
Tools and equipment, including personal protective equipment, are selected and checked	✓	✓		✓	✓	✓	
Work area is prepared to support the fabrication	✓		✓	✓	✓		✓
2. Identify installation requirements							
Roof drainage components required for installation are identified from drawings and specifications	✓	✓		✓	✓	✓	
Fabrication patterns are drawn based on design and freehand sketch of roof drainage.	✓		✓		✓		✓
Quantity, type and sizing of drainage components, rainwater materials and accessories required are calculated from drawings and specifications	✓	✓		✓	✓	✓	
Box gutter support system is fabricated according to relevant Maldivian standard	✓		✓	✓	✓		✓
3. Fabricate roof drainage components							
Method of fabrication, tools and machinery requirements are determined to suit job requirements	✓	✓		✓	✓	✓	
Materials are marked out from drawings to fabricate roof drainage components	✓		✓		✓		✓
Roof drainage components are fabricated in compliance with relevant Maldivian standards, drawings, specifications and site measurements	✓	✓		✓	✓	✓	
4. Set out and install roof drainage components							
Roof drainage components are set out to comply with job specifications and site measurements	✓	✓		✓	✓	✓	
Roof drainage components are jointed in compliance with job specifications and relevant Maldivian standards	✓		✓		✓		✓

Roof drainage system is installed according to relevant Maldivian standards and job specifications	✓	✓		✓	✓	✓	
System is performance tested for satisfactory installation and remedied	✓		✓	✓	✓		✓
5. Clean up							
Work area is cleared and materials disposed	✓	✓		✓	✓	✓	
Tools and equipment are cleaned, checked, maintained and stored	✓		✓		✓		✓
Documentation is completed according to workplace requirements	✓	✓		✓	✓	✓	

Note:

✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

#	Question	Answer
1	Define property drainage.	Property drainage refers to the systems that transfer runoff from roofs, paved areas and other surfaces of a premise to a suitable outlet or disposal facility.
2	What does property drainage involve?	<ul style="list-style-type: none"> ✓ Gutters ✓ Downpipes ✓ Drains ✓ Pipes ✓ Swales ✓ Storage and treatment facilities
3	Identify two types of roofs.	<ul style="list-style-type: none"> ✓ Heavily pitched ✓ Completely flat
4	Identify types of conventional gutters.	<ul style="list-style-type: none"> ✓ Pitched roof ✓ Roof drain
5	Explain how a pitched roof works.	The typical pitched roof can usually use gravity for all drainage purposes. On a pitched roof, water simply glides off and into gutters, which direct water into an underground drainage system
6	Explain how a roof drain works.	This roof drain option is simple, inexpensive, keeps water from pouring all over the place and provides sufficient protection for doors and windows. In addition, it helps avoid water pooling around the property’s foundation
7	Explain disadvantages of gutters.	However, the downside is that gutters do require frequent cleaning. While there are some covered gutter systems, the majority are open, allowing leaves, twigs and other debris to get into the system and clog it up. In addition, water may freeze in gutters during colder months, which can result in damage.

8	Identify two disadvantages of gutters.	<ul style="list-style-type: none"> ✓ Frequent cleaning ✓ Water may freeze
9	Explain how to clean gutters.	How can you clean your gutters? First, make sure you tell someone that you'll be working on the gutters. When you do, it's essential to use a secure ladder rather than precariously crawling on the roof. Using a gloved hand, scoop out any debris, leaves, and twigs from your gutters. Also, check your downspouts and scoop out any debris from the bottom area.
10	What are scuppers popular for?	For flat enclosed roofs, terraces and parapets.
11	What do scuppers consist of?	This type of roof drain consists of small holes cut in the side of the roof so that the water can drain out. Metal or rubber is typically used to flash the area around the hole so that water doesn't cause damage
12	How do scuppers work?	After exiting the hole, scuppers typically connect to a downspout to direct the water to an underground drainage system. In other instances, the scuppers protrude from the building and allow the water to fall into a prepared space such as a gravel drainage area, below.
13	What are some benefits of roof drains?	Luckily, these roof drains require very little maintenance. You can check to ensure that your downspouts aren't clogged periodically. All you need to do is do a quick walk around the roof and check the scuppers, removing any debris. Also, check the bottom of your downspouts for any potential debris.
14	Why do inner drains have protective barriers?	These drains typically have screens or protective barriers to prevent debris from washing down the pipe.
15	What is an advantage of inner drain?	Among the advantages of these drains is that there are no unsightly downspouts and gutters seen from the outside of the building and that there's little chance that pipes will freeze.
16	How do you clean inner drains?	Check your roof several times a year, using all necessary precautions, and look for debris in the sieves. Remove any debris and replace the sieves. Also, check the status of the sieves to see if any replacements are necessary. Any clogs will quickly show in pooling water on your roof.
17	Identify ways in which you can clean inner drains.	<ul style="list-style-type: none"> ✓ Check your roof several times a year, using all necessary precautions, and look for debris in the sieves. ✓ Remove any debris and replace the sieves. ✓ Check the status of the sieves to see if any replacements are necessary.
18	Explain siphonic drain.	The system essentially sucks water from the roof into the system and keeps air from being drawn in, meaning that the pipes can handle more. These systems work on flat and pitched roofs.
19	How do you clean siphonic drains?	To clean this type of drainage system, inspect the siphons themselves to check for debris pulled up against the screen and remove any that's there. This system also often involves gutters, meaning that you'll also have to routinely clean out gutters using a gloved hand to keep debris from entering the system.

20	Where are roof drainage systems located?	On top of the property drainage systems.
21	What is the design approach for drainage of roofs used for?	To determine the layouts and sizes of components, and then to analyse their behaviour in one or more design storms that will test the adequacy of the system.
22	What is the formula used for single sloping roof fully exposed to wind?	$A_c = A_h + \frac{A_v}{2}$
23	What is the formula used for two adjacent sloping roofs?	$A_c = A_{h1} + A_{h2} + \frac{1}{2}(A_{v2} - A_{v1})$
24	What is involved in the procedure for the design of an eaves gutter?	<ul style="list-style-type: none"> ✓ Determine the catchment area to each downpipe; ✓ Determine the design 5 minute duration, 20 year ARI rainfall intensity; and ✓ Choose the gutter size
25	What points should be noted when designing systems incorporating valley gutters?	<ul style="list-style-type: none"> ✓ Valley gutters should end at the high point of an eaves gutter; and ✓ The discharge from a valley gutter does not flow equally into both eaves gutters. Therefore the designer should allow at least 20% excess capacity in the sizing of the eaves gutters.
26	What should the design criteria of box gutters include?	<ul style="list-style-type: none"> ✓ Box gutters must be straight (no bends); ✓ Cross-section shape must have a constant base width and vertical sides; ✓ Longitudinal slope must be between 1:200 and 1:40. Changes in slope are not permitted; and ✓ The gutter must discharge directly into a rainhead or sump at the downstream end without change of direction
27	Briefly explain the procedure for design of a box gutter.	<ul style="list-style-type: none"> ✓ Determine the catchment area draining to each downpipe (Equation 4.1); ✓ Determine the design 5 minute duration, 100 year ARI rainfall intensity; ✓ Select the width and slope of the box gutter to suit the building layout; and ✓ Read off the minimum depth of the box gutter from Design Chart 4.A3. This minimum depth must be used for the full length of the box gutter. If a sloping box gutter is built with a horizontal top edge for architectural reasons, the minimum depth requirement still applies. When applying the design chart, the catchment area obtained is for draining to a single downpipe
28	Through what do box gutters discharge?	Via a rainhead or dump down to a downpipe.

2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to fabricating and installing roof drainage components, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas. <ul style="list-style-type: none"> ✓ Prepare for work ✓ Identify installation requirements ✓ Fabricate roof drainage components ✓ Set out and install roof drainage components ✓ Clean up
3	Review Assessment papers	Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following. <ul style="list-style-type: none"> ✓ Prepare for work ✓ Identify installation requirements ✓ Fabricate roof drainage components ✓ Set out and install roof drainage components ✓ Clean up
4	Demonstrate how to accurately observe rainheads and downpipes	The student is expected to follow the correct step-by step process of observing rainheads and downpipes. The elements which should be assessed are: <ul style="list-style-type: none"> ✓ Width of rainhead is equal to the width of box gutter. The rainhead must be sealed to the box gutter; ✓ The depth of a rainhead, hr must be at least 1.25 x equivalent diameter of a rectangular downpipe ($hr \geq 1.25De$) or 1.25 x internal diameter of a circular downpipe ($hr \geq 1.25Di$). ✓ There is an overflow weir at a lower level than the sole of the box gutter; and ✓ The rainhead to be fully seated to the box gutter and the front of the rainhead left open above the overflow weir.

3. OW =Observation at work Place

#	Questions	Answers
1	Assessment papers	While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.

		<ul style="list-style-type: none"> ✓ Prepare for work ✓ Identify installation requirements ✓ Fabricate roof drainage components ✓ Set out and install roof drainage components ✓ Clean up
2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to fabricating and installing roof drainage components and rainwater collection mechanisms for residential roof systems.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Demonstrate how to properly clean up after installation	As the students attend the practical test to assess their skill in proper housekeeping after operation, make sure the student use the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Answers
1	Prepare for work	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Plans and specifications are obtained and confirmed ✓ Tasks are planned and sequenced ✓ Tools and equipment, including personal protective equipment, are selected and checked ✓ Work area is prepared to support the fabrication
2	Identify installation requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Roof drainage components required for installation are identified from drawings and specifications. ✓ Fabrication patterns are drawn based on design and freehand sketch of roof drainage. ✓ Quantity, type and sizing of drainage components, rainwater materials and accessories required are calculated from drawings and specifications ✓ Box gutter support system is fabricated according to relevant Maldivian standard.
3	Fabricate roof drainage components	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Method of fabrication, tools and machinery requirements are determined to suit job requirements. ✓ Materials are marked out from drawings to fabricate roof drainage components.

		<ul style="list-style-type: none"> ✓ Roof drainage components are fabricated in compliance with relevant Maldivian standards, drawings, specifications and site measurements
4	Set out and install roof drainage components	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Roof drainage components are set out to comply with job specifications and site measurements. ✓ Roof drainage components are jointed in compliance with job specifications and relevant Maldivian standards ✓ Roof drainage system is installed according to relevant Maldivian standards and job specifications. ✓ System is performance tested for satisfactory installation and remedied
5	Clean up	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Work area is cleared and materials disposed ✓ Tools and equipment are cleaned, checked, maintained and stored ✓ Documentation is completed according to workplace requirements

5. TRB/LB =Trainee's Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee's Record/Log Book	As training progresses, students need to be given "Trainee's Record Book" or "Log Book". Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, "TR-Trainer Report" or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the "Assessment Plan" including the "Different sources of evidence" to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>

Unit-17: Perform plumbing to support rain water harvesting systems

Unit No	17
Unit Title	Perform plumbing to support rain water harvesting systems
Unit Code	CONS08CR10V1/21

Evidence Matrix

Elements of Competence and Performance Criteria	WT = written Test	PT=Practical Test	OW =Observation at work Place	OQ= Oral questioning	TRB/LB= Trainee's Record / Log Book	TR= trainer report	Other Sources *
1. Evaluate design parameters							
Scope of work is established for rainwater harvesting systems for wide span and highrise building projects	✓	✓		✓	✓	✓	
Design requirements are determined from relevant Maldivian standards, codes, plans, specifications and client brief	✓		✓	✓	✓	✓	✓
Potential contamination sources are analyzed and solutions are applied	✓	✓	✓	✓		✓	✓
Rainfall patterns and required rainwater storage volumes are established	✓	✓		✓	✓	✓	
Cost-benefit analysis is conducted comparing a range of pipe materials and system designs	✓		✓	✓	✓	✓	✓
Statutory, regulatory requirements and relevant Maldivian standards and codes for the design of rainwater harvesting systems are interpreted, analyzed and applied	✓	✓	✓	✓		✓	✓
Manufacturer requirements and trade and technical manuals are interpreted	✓	✓		✓	✓	✓	
Additional research, including a desktop study, is conducted to outline design parameters	✓		✓	✓	✓	✓	✓
Performance requirements are established, considering safety of system users or building occupants	✓	✓	✓	✓		✓	✓
2. Plan and detail system components							
Tank type and location are specified	✓	✓		✓	✓	✓	
Layout of pipework systems and type and location of fittings, valves and controls are planned	✓		✓	✓	✓	✓	✓
First-flush systems are designed and detailed	✓	✓	✓	✓		✓	✓
Filtration systems and water contamination solutions are specified	✓	✓		✓	✓	✓	

Pipe size calculations are completed for a range of applications	✓		✓	✓	✓	✓	✓
Separation of services and backflow prevention devices are designed and detailed	✓	✓	✓	✓		✓	✓
Approved non-contaminating materials and jointing methods for rainwater harvesting are specified and pipe supports are designed	✓	✓		✓	✓	✓	
Pump and ancillary requirements are sized and detailed	✓		✓	✓	✓	✓	✓
Installation requirements are specified	✓	✓	✓	✓		✓	✓
Water treatment is specified according to state and territory health requirements	✓	✓		✓	✓	✓	
Vermin protection is specified according to manufacturer and state and territory requirements	✓		✓	✓	✓	✓	✓
Allowance for expansion and contraction is provided	✓	✓	✓	✓		✓	✓
3. Undertake plumbing tasks associated with the system							
Rainwater harvesting systems are designed and detailed for a range of residential, commercial and industrial applications	✓	✓		✓	✓	✓	✓
Rainwater reuse systems are designed and detailed	✓		✓	✓	✓	✓	✓
Rainwater harvesting systems are designed and sized using calculation and computer software packages	✓	✓	✓	✓		✓	✓
Sustainability principles and concepts are applied throughout the design process	✓	✓		✓	✓	✓	
4. Prepare documentation							
Client brief of the desired design is prepared	✓	✓		✓	✓	✓	
Plans and specifications are prepared for a range of rainwater harvesting systems	✓		✓	✓	✓	✓	✓
Testing and commissioning schedule is prepared	✓	✓	✓	✓		✓	✓
Operation and maintenance manual is produced, including information on how to properly and safely maintain the system	✓	✓		✓	✓	✓	✓

Note:

✓ “Other Sources” meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = Certificates T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play.

1. Written questions

#	Question	Answer
1	What is rain water harvesting?	Rain Water Harvesting is a technology used for collecting water from surface on which it falls and storage of this water for use when needed.
2	What are the two main techniques of rainwater harvesting?	<ul style="list-style-type: none"> ✓ Storage for future use ✓ Recharge into the ground

3	Identify the components of a rainwater harvesting system.	<ul style="list-style-type: none"> ✓ Catchment Area/Roof ✓ Gutters and Downspouts ✓ Cisterns or storage tanks
4	Describe the components of a rainwater harvesting system.	<ul style="list-style-type: none"> ✓ Catchment Area/Roof: The surface upon which the rain falls; the roof has to be appropriately sloped preferably towards the direction of storage and recharge. ✓ Gutters and Downspouts: The transport channels from catchment surface to storage; Gutters and/or Down pipes have to be designed depending on site, rainfall characteristics and roof characteristics. ✓ Cisterns or storage tanks: Sumps, tanks etc. where collected rain-water is safely stored or recharging the Ground water through open wells, bore wells or percolation pits etc.
5	How is water drawn from tanks?	By means of taps at the base of the tanks.
6	What are some materials commonly used in the construction of the roofs?	<ul style="list-style-type: none"> ✓ Corrugated aluminum ✓ Galvanized iron ✓ Concrete ✓ Asphalt ✓ Fiberglass shingles ✓ Tiles with neoprene-based coating
7	What do conveyance systems usually consist of?	<ul style="list-style-type: none"> ✓ Gutters ✓ Drainpipes
8	What should storage tanks be constructed of?	<p>Inert material such as</p> <ul style="list-style-type: none"> ✓ Reinforced concrete ✓ Ferro cement ✓ Fiberglass ✓ Polyethylene ✓ Stainless steel
9	Identify some factors that influence rainwater harvesting potential of a site.	<ul style="list-style-type: none"> ✓ Rainfall quantity ✓ Rainfall pattern ✓ Catchment area characteristics
10	Explain how rainfall quantity influences rainwater harvesting potential of a site.	Rainfall is the most unpredictable variable in the calculation and hence, to determine the potential rainwater supply for a given catchment, reliable rainfall data are required, preferably for a period of at least 10 years. Also, it would be far better to use rainfall data from the nearest station with comparable conditions
11	Explain how rainfall pattern influences rainwater harvesting potential of a site.	The number of annual rainy days also influences the need and design for rainwater harvesting. The fewer the annual rainy days or the longer the dry period, the more will be the need for rainwater collection in a region. However, if the dry period was too long, big storage tanks would be needed to store rainwater. Hence in such regions, it is more feasible to use rainwater to recharge ground water aquifers rather than for storage
12	Explain how characteristics of	Runoff depends upon the area and type of the catchment over which it falls, as well as surface features. All calculations

	catchment area influences rainwater harvesting potential of a site.	relating to the performance of rainwater catchment systems involve the use of runoff coefficient to account for losses due to spillage, leakage, infiltration, catchment surface wetting and evaporation, which will all contribute to reducing the amount of runoff. (Runoff coefficient for any catchment is the ratio of the volume of water that runs off a surface to the volume of rainfall that falls on the surface). The collection efficiency accounts for the fact that all the rainwater falling over an area cannot be effectively harvested, because of evaporation, spillage etc. Factors like runoff coefficient and the first-flush diverter are taken into account when estimating the collection efficiency.
13	Briefly explain how rainwater is harvested.	The rainwater is harvested in following manner. <ul style="list-style-type: none"> ✓ Collect rainwater from the roof top ✓ Drain it down from the pipes ✓ Store it in a tank ✓ Treat it if required ✓ Draw it for use
14	Identify three requirements for rainwater harvesting.	<ul style="list-style-type: none"> ✓ Rainfall should be over 50mm/month for at least half of the year (unless other sources are extremely scarce) ✓ Local roofs should be made from impermeable materials such as iron sheets or tiles ✓ There should be an area of at least 1m² near each house upon which a tank can be constructed ✓ There should be some other water source, either ground water or (for secondary uses) surface water that can be used when the stored rainwater runs out
15	Explain in detail the benefits of rainwater harvesting.	Rainwater harvesting provides the long-term answers to the problem of water scarcity. Rainwater harvesting offers an ideal solution in areas where there is sufficient rain but inadequate ground water supply and surface water resources are either lacking or are insufficient. Rainwater harvesting system is particularly useful in remote areas as it has the ability to operate independently. The whole process is environment friendly. There are a number of ways in which water harvesting can benefit a community – water harvesting enables efficient collection and storage of rainwater, makes it accessible and substitutes for poor quality water. Water harvesting helps smoothen out variation in water availability by collecting the rain and storing it more efficiently in closed stores or in sandy riverbeds. In doing so, water harvesting assures a continuous and reliable access to water.
16	What can be done with collected rainwater that isn't stored for direct use?	It can be recharged into the ground water to improve the quality of ground water and rise in the water levels in wells and bore wells that are drying up as well as reduce the soil erosion as the surface runoff is reduced.
17	What is the consequence of increased evaporation from reservoirs?	At the same time increased evaporation from reservoirs and reduced river flows in some areas may decrease the available surface water supplies.

18	How can scarcity and accelerating demand of water in urban areas be reduced?	In urban areas, scarcity and accelerating demand of water is a major problem and it can be reduced by rainwater harvesting, using various existing structures like rooftops, parking lots, playgrounds, parks, ponds, flood plains, etc. to increase the ground water table, which saves the electric energy to lift the ground water because one metre rise in water level saves 0.40 kilowatt hour of electricity. Subsequently it can also reduce storm drainage load and flooding in city streets.
19	Explain in detail the limitations of the system.	Rainwater harvesting systems are completely dependent upon the frequency and amount of rainfall. There will be shortages during dry spells or prolonged droughts, which can be exacerbated by low storage capacities. If greater storage capacities are provided, the additional construction and operation costs may be expensive for some households. Leakages from cisterns can cause the damages to the foundation of building and may increase construction cost that may have adverse effect on home ownership. Also the water may become contaminated if the storage tanks are not adequately covered, and uncovered or poorly covered storage tanks can be unsafe for small children. Contamination can also occur from dirty catchment areas. Water treatment is infrequent in many countries due to lack of adequate resources and lack of treatment may lead to health risks. Similarly neglect in routine maintenance can also impair the quality of water and affect health. In the case of community systems, people have to walk significant distances for water if a distribution system is not in place. All systems require maintenance to minimize wastage through broken gutters, drainpipes, leaking storage tanks or outlet taps.
20	Identify the main factors that determine the feasibility of rainwater harvesting.	<ul style="list-style-type: none"> ✓ Water availability ✓ Acceptability ✓ Cost of the system ✓ Water quality ✓ Policy
21	Explain in detail the main factors that determine the feasibility of rainwater harvesting.	<ul style="list-style-type: none"> ✓ Water availability: The volume of rainfall and rainwater collected should meet a significant part of the water needs of the household. The technology features of the system and water management practices have a direct effect on water availability. ✓ Acceptability: Use of rainwater harvesting for drinking and other purposes has to be culturally accepted by the users. The positive impacts, i.e. the benefits, that the rainwater harvesting system brings to the community influences the level of acceptability towards the RWH system. The users are able to give expression to how valuable rainwater harvesting is to them. An analysis of the benefits that rainwater harvesting offers to the users will help to determine whether the amount of water collected makes a difference.

		<ul style="list-style-type: none"> ✓ Cost of the system: The cost of installing a rainwater harvesting system should not be substantially higher than other water supply options suitable for the community of study. The availability of credit and financial resources also determines the ability to install rainwater harvesting systems. ✓ Water quality: quality of rainwater should be safe for human consumption. Operation and maintenance needs to be done properly to ensure good quality water. ✓ Policy: Regulations and guidelines for implementers and users need to be put in place to ensure the effectiveness of rainwater harvesting programmes and risk minimisation.
22	What are the four factors that effective rainwater harvesting will depend on?	<ul style="list-style-type: none"> ✓ Rainfall data ✓ Roof area ✓ Water storage capacity ✓ Daily consumption rate
23	Why is knowing the size of the roof important?	The rain amount and household water demand varies from place to place and family to family respectively. Thus prior to designing rainwater harvesting system, knowing roof size is most important for each household for effective rainwater harvesting
24	What are gutters?	Gutters are channels fixed to the edges of roof all around to collect and transport rainwater from the roof to the storage tank.
25	What happens to gutters when it comes to high intensity rains?	With high intensity rains, rainwater may shoot over the conventional gutter, resulting in a low production; splash guards can prevent this spillage.

2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to performing plumbing to support rainwater harvesting systems, as they continue with the unit. Referred assignment will be covering practical aspects related to the unit.
2	Review Log Book for practical activities	<p>Review log books and examine participation of the students in relevant workplace activities and in particular of the following areas.</p> <ul style="list-style-type: none"> ✓ Evaluate design parameters ✓ Plan and detail system components ✓ Undertake plumbing tasks associated with the system ✓ Prepare documentation
3	Review Assessment papers	<p>Review unit and final assessment papers completed by the students and crosscheck their practical skills related to the following.</p> <ul style="list-style-type: none"> ✓ Evaluate design parameters ✓ Plan and detail system components

		<ul style="list-style-type: none"> ✓ Undertake plumbing tasks associated with the system ✓ Prepare documentation 																								
4	Demonstrate the accurate way of harvesting rainwater	<p>The student is expected to follow the correct step-by step process of harvesting rainwater. The elements which should be assessed are:</p> <ul style="list-style-type: none"> ✓ Collect rain water from the roof top ✓ Drain it down from the pipes ✓ Store it in a tank ✓ Treat it if required ✓ Draw it for use 																								
5	Demonstrate the proper way of designing gutter size	<p>The student is expected to follow the correct step-by step process of designing gutter size. The elements which should be assessed are:</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Roof area m²</th> <th>Gutter width, mm</th> <th>Down pipe, mm</th> </tr> </thead> <tbody> <tr> <td>17</td> <td>60</td> <td>40</td> </tr> <tr> <td>25</td> <td>70</td> <td>50</td> </tr> <tr> <td>34</td> <td>80</td> <td>50</td> </tr> <tr> <td>46</td> <td>90</td> <td>63</td> </tr> <tr> <td>66</td> <td>100</td> <td>63</td> </tr> <tr> <td>128</td> <td>125</td> <td>75</td> </tr> <tr> <td>208</td> <td>150</td> <td>90</td> </tr> </tbody> </table> <p style="text-align: center;"><i>Table: Required gutter width and down pipe size</i></p>	Roof area m ²	Gutter width, mm	Down pipe, mm	17	60	40	25	70	50	34	80	50	46	90	63	66	100	63	128	125	75	208	150	90
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3. OW =Observation at work Place

#	Questions	Answers
1	Assessment papers	<p>While reviewing the papers, make an assessment of the student knowledge and skills related to the various elements stipulated within the competency unit. Please make sure the observations and findings are compared to the theoretical knowledge and practical skills included within the following areas prior to making a judgment on the performance of the students.</p> <ul style="list-style-type: none"> ✓ Evaluate design parameters ✓ Plan and detail system components

		<ul style="list-style-type: none"> ✓ Undertake plumbing tasks associated with the system ✓ Prepare documentation
2	Log Books	Likewise, make sure log books are reviewed to assess and evaluate extent of student participation on practical activities related to the above areas or elements covered within the competency unit.
3	Student Assignments	<p>During the implementation of the training program, students would have completed assignments related to designing systems for the collection, storage, distribution and re-use of rainwater for drinking and non- drinking uses, including irrigation, toilet flushing and other uses approved by relevant authorities.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Demonstrate knowledge of the proper roof material	As the students attend the practical test to assess their skill in identifying proper material to make roofs from, make sure the student use the proper techniques and the information he shared is accurate.

4. OQ=Oral Questioning

#	Questions	Answers
1	Evaluate parameters design	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Scope of work is established for rainwater harvesting systems for wide span and high- rise building projects. ✓ Design requirements are determined from relevant Maldivian standards, codes, plans, specifications and client brief. ✓ Potential contamination sources are analyzed and solutions are applied. ✓ Rainfall patterns and required rainwater storage volumes are established. ✓ Cost-benefit analysis is conducted comparing a range of pipe materials and system designs. ✓ Statutory, regulatory requirements and relevant Maldivian standards and codes for the design of rainwater harvesting systems are interpreted, analyzed and applied. ✓ Manufacturer requirements and trade and technical manuals are interpreted. ✓ Additional research, including a desktop study, is conducted to outline design parameters. ✓ Performance requirements are established, considering safety of system users or building occupants

2	Plan and detail system components	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Tank type and location are specified. ✓ Layout of pipework systems and type and location of fittings, valves and controls are planned. ✓ First-flush systems are designed and detailed. ✓ Filtration systems and water contamination solutions are specified. ✓ Pipe size calculations are completed for a range of applications. ✓ Separation of services and backflow prevention devices are designed and detailed. ✓ Approved non-contaminating materials and jointing methods for rainwater harvesting are specified and pipe supports are designed. ✓ Pump and ancillary requirements are sized and detailed. ✓ Installation requirements are specified. ✓ Water treatment is specified according to state and territory health requirements. ✓ Vermin protection is specified according to manufacturer and state and territory requirements. ✓ Allowance for expansion and contraction is provided
3	Undertake plumbing tasks associated with the system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Rainwater harvesting systems are designed and detailed for a range of residential, commercial and industrial applications. ✓ Rainwater reuse systems are designed and detailed. ✓ Rainwater harvesting systems are designed and sized using calculation and computer software packages. ✓ Sustainability principles and concepts are applied throughout the design process.
4	Prepare documentation	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> ✓ Client brief of the desired design is prepared. ✓ Plans and specifications are prepared for a range of rainwater harvesting systems. ✓ Testing and commissioning schedule is prepared. ✓ Operation and maintenance manual is produced, including information on how to properly and safely maintain the system.

5. TRB/LB =Trainee’s Record/Log Book

#	Name of the Source	Information to be checked
1	TRB/LB =Trainee’s Record/Log Book	As training progresses, students need to be given “Trainee’s Record Book” or “Log Book”. Referred book will be used to entry the daily classes and workplace activities and can play an important source of evidence for assessment.
2	TR=Trainer Report	It is expected that every training program will encourage establishment and proper management of all the training records. In this regard, “TR-Trainer Report” or daily training records will illustrate the various training activities being performed and hence can be another important source of information for the assessment.
3	Oher Sources	<p>Competency Based Assessment (CBA) adopted for the assessment of this competency unit calls for gathering of evidences and can be from different sources such as S=supervisor/team leader report, C = Certificates, T=Testimonies, VD= Video, P= Photographs, PP= Product produced, S= Simulations, CS= Case Studies,FB= Feedback from Fellow Members and RP= Role Play, etc.</p> <p>Nominated assessor needs to communicate the “Assessment Plan” including the “Different sources of evidence” to the training institution with the commencement of the program to ensure evidence gathering is undertaken on timely manner with presentation of all the required evidence prior to undertaking Final Assessment.</p>



PLUMBING