



# ASSESSMENT RESOURCES BOOK

SEWERAGE SYSTEM  
OPERATION & MAINTENANCE IV



GREEN  
CLIMATE  
FUND

**MNSDA**



Ministry of Environment  
Climate Change & Technology

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## **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
<b>Prior to the assessment I have:</b>			
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.		
<b>During the assessment I have:</b>			
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.		
<b>After the assessment I have:</b>			
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: Write technical reports

Unit No	01
Unit Title	Write technical reports
Unit Code	CONCM08V1/21

### 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 *
<b>1. Plan the research and write the proposal</b>							
Purpose or objective of the research is identified, and confirmed with stakeholders	✓	✓	✓	✓	✓	✓	✓
Scope and nature of the information requirements are identified	✓		✓	✓	✓		✓
All possible sources of the required information are researched and identified	✓	✓		✓	✓	✓	
A systematic research or information collection plan is designed to optimize the process		✓	✓	✓		✓	✓
Resources are obtained and scheduled to service the research requirements	✓	✓	✓		✓	✓	✓
<b>2. Conduct research</b>							
Research is undertaken effectively in accordance with the plan	✓	✓	✓	✓	✓	✓	✓
Experiments and tests to support the research effort are conducted in a manner which ensures the demonstrable integrity of the outcomes or findings	✓		✓	✓	✓		✓
Research findings are logged, documented and stored to maintain traceability	✓	✓		✓	✓	✓	
Preliminary analysis is conducted to identify requirements for variations or additions to the research plan		✓	✓	✓		✓	✓
<b>3. Analyse the information</b>							
Information is sorted, documented and prepared for the analytical process	✓	✓	✓	✓	✓	✓	✓
Information and data is manipulated to enable reasonable comparisons and judgments	✓		✓	✓	✓		✓
Clarification by way of expert advice and opinion is sought	✓	✓		✓	✓	✓	
<b>4. Prepare and present the report</b>							

Report clearly defines the objectives, process, findings and further actions	✓	✓	✓	✓	✓	✓	✓
Report addresses and satisfies the stated objective and timeframe	✓		✓	✓	✓		✓
Report and associated presentation materials are of a standard and quality for the intended audience	✓	✓		✓	✓	✓	
Reader comprehension of the report is aided by use of executive summaries and attachments		✓	✓	✓		✓	✓
Information management requirements, including documenting and repository actions are satisfied in accordance with enterprise procedures	✓	✓	✓		✓	✓	✓

**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	What is the purpose of a proposal?	A proposal allows the writer to clarify what it is he/she wants to do, why and how he/she wants to do it and present what you want to do in the manner and timeframe proposed.
2	What are the components to a proposal?	<ol style="list-style-type: none"> <li>1. Title</li> <li>2. Introduction</li> <li>3. Research question</li> <li>4. Method</li> <li>5. Project</li> <li>6. Timeline</li> <li>7. References</li> </ol>
3	Explain what a research plan is	The research plan shall detail completely the prosecution of the research, including the submission of an acceptable final report. The plan ultimately becomes a part of the contract by reference of the proposal; therefore, it should describe, in a specific and straightforward manner, the proposed approach to the solution of the problem described in the project statement.
4	While evaluating a research project an expert opinion is important. What is an expert opinion?	This method involves obtaining the opinions of people who are knowledgeable about the subject of the research and the impact of the project being evaluated. The experts can be internal or external to the agency.
5	What is user or client opinion?	This method involves obtaining the opinions of clients, often through technical advisory committees or project panels.

6	What are the advantages of case studies?	The advantage of case studies is that they afford the best opportunity of identifying the relationship between the research study and the impact of the research results. They are particularly useful for evaluating projects that benefit the public good, rather than using cost-benefit analyses that assign dubious values to some impacts such as the value of a human life. Because the results are usually qualitative, it is difficult to use case studies to compare the value of projects, or to aggregate the results to demonstrate the value of research programs.
7	What is a report?	A report is a written presentation of factual information based on an investigation or research.
8	What makes an effective report?	<ul style="list-style-type: none"> <li>✓ Clear, concise and accurate</li> <li>✓ Easy for the audience to understand</li> <li>✓ Appropriate for the audience</li> <li>✓ Well organized with clear section headings</li> </ul>
9	What are the content that a report must cover?	<ul style="list-style-type: none"> <li>✓ Title page</li> <li>✓ Table of contents</li> <li>✓ Abstract or executive summary</li> <li>✓ Introduction (or Terms of Reference &amp; Procedure)</li> <li>✓ Findings and / or Discussion</li> <li>✓ Recommendations</li> <li>✓ References</li> </ul>
10	What is the purpose of "Terms of Reference" in a report?	Briefly states the purpose and scope of the report. This includes who requested the report, the main issues or problems to be identified, the reason for undertaking the report and the due date of the report.

## 2. PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to plan and conduct research, to evaluate information and findings, and to develop, document and present technical reports, 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"> <li>✓ Plan the research and write the proposal</li> <li>✓ Conduct research</li> <li>✓ Analyse the information</li> <li>✓ Prepare and present the report</li> </ul>
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"> <li>✓ Plan the research and write the proposal</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Conduct research</li> <li>✓ Analyse the information</li> <li>✓ Prepare and present the report</li> </ul>
4	Prepare and present a report	<p>Every student is expected to conduct a research effectively in accordance with the plan. The information is sorted, documented and prepared for analytical process.</p> <ul style="list-style-type: none"> <li>✓ Students must clearly define the objective, process, findings &amp; further actions</li> </ul>

### 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"> <li>✓ Plan the research and write the proposal</li> <li>✓ Conduct research</li> <li>✓ Analyse the information</li> <li>✓ Prepare and present the report</li> </ul>
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 their own work where tasks involve one or more steps or functions and are carried out routinely on a regular basis.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Presenting the report	<ul style="list-style-type: none"> <li>✓ Accuracy of the information shared</li> <li>✓ Report addresses and satisfies the stated objective and time frame.</li> <li>✓ Relevancy of the information</li> <li>✓ Application of different knowledge to relevant situations</li> </ul>

### 4. OQ=Oral Questioning

#	Questions	Answers
1	Plan the research and write the proposal	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Purpose or objective of the research is identified,</li> </ul>

		<p>and confirmed with stakeholders</p> <ul style="list-style-type: none"> <li>✓ Scope and nature of the information requirements are identified.</li> <li>✓ All possible sources of the required information are researched and identified</li> <li>✓ A systematic research or information collection plan is designed to optimize the process.</li> <li>✓ Resources are obtained and scheduled to service the research requirements.</li> </ul>
2	Conduct research	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Research is undertaken effectively in accordance with the plan</li> <li>✓ Experiments and tests to support the research effort are conducted in a manner which ensures the demonstrable integrity of the outcomes or findings</li> <li>✓ Research findings are logged, documented and stored to maintain traceability</li> <li>✓ Preliminary analysis is conducted to identify requirements for variations or additions to the research plan</li> </ul>
3	Analyze the information	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Information is sorted, documented and prepared for the analytical process.</li> <li>✓ Information and data is manipulated to enable reasonable comparisons and judgements.</li> <li>✓ Clarification by way of expert advice and opinion is sought.</li> </ul>
4	Prepare and present the report	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Report clearly defines the objectives, process, findings and further actions.</li> <li>✓ Report addresses and satisfies the stated objective and timeframe</li> <li>✓ Report and associated presentation materials are of a standard and quality for the intended audience</li> </ul>



		<ul style="list-style-type: none"> <li>✓ Reader comprehension of the report is aided by use of executive summaries and attachments.</li> <li>✓ Information management requirements, including documenting and repository actions are satisfied in accordance with enterprise procedures.</li> </ul>
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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-2: Apply and maintain Occupational Health and Safety

Unit No	02
Unit Title	Apply and maintain Occupational Health and Safety
Unit Code	CONCM09V1/21

### 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 *
<b>1. Perform all work safely</b>							
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.	✓		✓	✓	✓		✓
<b>2. Ensure others in the work group are able to implement safe work practices</b>							
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	✓		✓	✓	✓		✓
<b>3. Monitor observance of safe work practices in the work area</b>							
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	✓	✓	✓	✓		✓	✓
<b>4. Participate in risk management processes</b>							
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	✓	✓	✓	✓		✓	✓
<b>5. Support the implementation of emergency procedures within the work group</b>							
Ensure that workplace procedures for dealing with incidents and emergencies are available and known by work group	✓	✓	✓	✓		✓	✓
Implement processes to ensure that others in the work area are able to respond appropriately to incidents and emergencies	✓		✓	✓	✓		✓
Participate, as required, in investigations of hazardous incidents to identify their cause	✓	✓	✓	✓		✓	✓

**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 the objective of a safety program?	A safety program is to prevent injuries and to allow you to do your job efficiently and safely
2	Why is it important to let your supervisor know if you are under any medication?	As some medications may impair your ability to work or operate equipment safely.
3	What is workplace hazard?	Hazard means a situation or thing that has the potential to harm a person. Hazards at work may include: noisy machinery, a moving forklift, chemicals, electricity, working at heights, a repetitive job, bullying and violence at the workplace.
4	What is Risk Control?	Risk control means taking action to eliminate health and safety risks so far as is reasonably practicable, and if that is not possible, minimising the risks so far as is reasonably practicable.
5	What does a risk assessment help determine?	<ul style="list-style-type: none"> <li>✓ How severe a risk is?</li> <li>✓ Whether any existing control measures are effective</li> <li>✓ What action you should take to control the risk</li> <li>✓ How urgently the action needs to be taken.</li> </ul>
6	How would you work out the chain of events?	One way of working out the chain of events is to determine the starting point where things begin to go wrong and then consider: 'If this happens, what may happen next?' This will provide a list of events that sooner or later cause harm.
7	What are the things you should consider to estimate the severity of a hazard?	<ul style="list-style-type: none"> <li>✓ What type of harm could occur?</li> <li>✓ What factors could influence the severity of harm that occurs?</li> <li>✓ How many people are exposed to the hazard and how many could be harmed in and outside your workplace?</li> <li>✓ Could one failure lead to other failures?</li> </ul>
8	"All hazards have the potential to cause different types and severities of harm." Give an example for this statement	For example, heavy liquefied petroleum gas (LPG) cylinders can cause muscular strain when they are handled manually. However, if the cylinder is damaged causing gas to leak which is then ignited, a fire could result in serious burns. If that leak occurs in a store room or similar enclosed space, it could result in an explosion that could destroy the building and kill or injure anyone nearby. Each of the outcomes involves a different type of harm with a range of severities, and each has a different likelihood of occurrence.
9	Describe 3 situations where a risk assessment is not necessary.	<ol style="list-style-type: none"> <li>1. Legislation requires some hazards or risks to be controlled in a specific way – these requirements must be complied with.</li> <li>2. A code of practice or other guidance sets out a way of controlling a hazard or risk that is applicable to your</li> </ol>

		<p>situation and you choose to use the recommended controls. In these instances, the guidance can be followed.</p> <p>3. There are well-known and effective controls that are in use in the particular industry, that are suited to the circumstances in your workplace. These controls can simply be implemented</p>
10	When should a risk assessment must be carried out?	<p>When:</p> <ul style="list-style-type: none"> <li>✓ There is uncertainty about how a hazard may result in injury or illness</li> <li>✓ The work activity involves a number of different hazards and there is a lack of understanding about how the hazards may interact with each other to produce new or greater risks</li> <li>✓ Changes at the workplace occur that may impact on the effectiveness of control measures.</li> </ul>

### 1. PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to planning to monitor and maintain work health and safety (WHS) within a work area, 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"> <li>✓ Perform all work safely</li> <li>✓ Ensure others in the work group are able to implement safe work practices</li> <li>✓ Monitor observance of safe work practices in the work area</li> <li>✓ Participate in risk management processes</li> <li>✓ Support the implementation of emergency procedures within the work group</li> </ul>
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"> <li>✓ Perform all work safely</li> <li>✓ Ensure others in the work group are able to implement safe work practices</li> <li>✓ Monitor observance of safe work practices in the work area</li> <li>✓ Participate in risk management processes</li> <li>✓ Support the implementation of emergency procedures within the work group</li> </ul>

4	<b>Carryout risk assessment process</b>	<p>Students must participate</p> <ul style="list-style-type: none"> <li>✓ In reporting and addressing any identified hazards and inadequacies in existing risk controls</li> <li>✓ In identifying and analyzing risks</li> <li>✓ In implementing procedures to control risk</li> <li>✓ In ensuring records of incidents in the work area and other required documentation are accurately completed.</li> </ul>
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## 2. 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"> <li>✓ Perform all work safely</li> <li>✓ Ensure others in the work group are able to implement safe work practices</li> <li>✓ Monitor observance of safe work practices in the work area</li> <li>✓ Participate in risk management processes</li> <li>✓ Support the implementation of emergency procedures within the work group</li> </ul>
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 planning their own work where tasks involve one or more steps or functions and are carried out routinely on a regular basis.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Carryout risk assessment process	<p>Use the presentation and assess the following</p> <p>Participate in risk assessments to identify and analyses risks</p>

## 3. OQ=Oral Questioning

#	Questions	Answers
1	Perform all work safely	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Use established work practices and personal protective equipment (PPE) to</li> </ul>

		<p>ensure personal safety and that of other workplace personnel</p> <ul style="list-style-type: none"> <li>✓ Clean, care for and store equipment, materials and reagents as required</li> <li>✓ Minimise the generation of wastes and environmental impacts</li> <li>✓ Ensure safe disposal of laboratory/hazardous wastes</li> </ul>
2	Ensure others in the work group are able to implement safe work practices	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Ensure hazard controls and PPE appropriate to the work requirements are available and functional</li> <li>✓ Provide and communicate current information about workplace health and safety policies, procedures and programs to others</li> <li>✓ Ensure hazards and control measures relating to work responsibilities are known by those in the work area</li> <li>✓ Provide support to those in the work area to implement procedures to support safety</li> <li>✓ Identify and address training needs within level of responsibility</li> </ul>
3	Monitor observance of safe work practices in the work area	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Ensure workplace procedures are clearly defined, documented and followed</li> <li>✓ Identify any deviation from identified procedures and report and address within level of responsibility</li> <li>✓ Ensure personal behaviour is consistent with workplace policies and procedures</li> <li>✓ Encourage and follow up others to identify and report hazards in the work area</li> <li>✓ Monitor conditions and follow up to ensure housekeeping standards in the work area are maintained</li> </ul>
4	Participate in risk management processes	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Report and address any identified hazards and inadequacies in existing risk controls within level of responsibility and according to workplace procedures</li> <li>✓ Participate in risk assessments to identify and analyse risks</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Support the implementation of procedures to control risk (based on the hierarchy of control)</li> <li>✓ Ensure records of incidents in the work area and other required documentation are accurately completed and maintained</li> </ul>
5	Support the implementation of emergency procedures within the work group	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Ensure that workplace procedures for dealing with incidents and emergencies are available and known by work group</li> <li>✓ Implement processes to ensure that others in the work area are able to respond appropriately to incidents and emergencies</li> <li>✓ Participate, as required, in investigations of hazardous incidents to identify their cause</li> </ul>

#### 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	<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-3: Carry out data entry and retrieval procedures

Unit No	03
Unit Title	Carry out data entry and retrieval procedures
Unit Code	CONCM10V1/21

### 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 *
<b>1. Initiate computer system</b>							
The hardware components of the computer and their functions are correctly identified	✓	✓	✓	✓		✓	✓
Equipment is powered up correctly	✓		✓	✓	✓		✓
Access codes are correctly applied	✓	✓	✓	✓		✓	✓
Appropriate software is selected or loaded from the menu	✓		✓	✓	✓		✓
<b>2. Enter data</b>							
Types of data for entry correctly identified and collected	✓	✓	✓	✓		✓	✓
Input devices selected and used are appropriate for the intended operations	✓		✓	✓	✓		✓
Manipulative procedures of Input device conform to established practices	✓	✓	✓	✓		✓	✓
Computer files are correctly located or new files are created, named and saved	✓		✓	✓	✓		✓
Data is accurately entered in the appropriate files using specified procedure and format	✓	✓	✓	✓		✓	✓
Back-up made in accordance with operative procedures	✓		✓	✓	✓		✓
<b>3. Retrieve data</b>							
The identity and source of information is established	✓	✓	✓	✓		✓	✓
Authority to access data is obtained where required	✓		✓	✓	✓		✓
Files and data are correctly located and accessed	✓	✓	✓	✓		✓	✓
Integrity and confidentiality of data are maintained	✓		✓	✓	✓		✓
The relevant reports or information retrieved using approved procedure	✓	✓	✓	✓		✓	✓
Formats of retrieved report or information conform to that required	✓		✓	✓	✓		✓
Copy of the data is printed where required	✓	✓	✓	✓		✓	✓
<b>4. Amend data</b>							

Source of data/information for amendment is established	✓	✓	✓	✓		✓	✓
Data to be amended is correctly located within the file	✓		✓	✓	✓		✓
The correct data/information is entered, changed or deleted using appropriate input device and approved procedures	✓	✓	✓	✓		✓	✓
The Integrity of data is maintained	✓		✓	✓	✓		✓
<b>5. Monitor the operation of equipment</b>							
The system is monitored for correct operation of tasks	✓	✓	✓	✓		✓	✓
Routine system messages are promptly and correctly dealt with	✓		✓	✓	✓		✓
Error conditions within level of authority are dealt with promptly and uncorrected errors are promptly reported	✓	✓	✓	✓		✓	✓
Output devices and materials are monitored for quality	✓		✓	✓	✓		✓
<b>6. Access and transmit information via the Internet</b>							
Access to the Internet is gained in accordance with the provider's operating procedures	✓	✓	✓	✓		✓	✓
Evidence of the ability to negotiate web sites to locate and access specified information and other services is efficiently demonstrated	✓		✓	✓	✓		✓
E-mail is sent and retrieved competently	✓	✓	✓	✓		✓	✓
<b>7. Close down computer system</b>							
The correct shut down sequence is followed	✓	✓	✓	✓		✓	✓
Problem with shutting down computer is reported promptly	✓		✓	✓	✓		✓
All safety and protective procedures are observed	✓	✓	✓	✓		✓	✓

**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 Question

#	Question	Answer
1	What are the basic functions that a computer is programmed to do?	<ol style="list-style-type: none"> <li>1. Receive input</li> <li>2. Process information</li> <li>3. Produce output</li> <li>4. Store information</li> </ol>
2	Any computer system is made of two parts. What are they?	<ul style="list-style-type: none"> <li>✓ Hardware</li> <li>✓ Software</li> </ul>
3	What does a hardware consists of?	A hardware consists of the microprocessor (the computer's brain), the memory and the input or output connections which get data in and out of the microprocessor.
4	What are peripherals?	Peripherals are devices that allow us to communicate with the computer. Peripheral devices can be external -- such as a mouse, keyboard, printer, external zip drive or scanner -- or internal, such as a CD-ROM, CD-R or internal modem. Internal peripheral devices are often referred to as integrated peripherals
5	Software is divided into two categories. What are they?	<ol style="list-style-type: none"> <li>1. System software</li> <li>2. Application software</li> </ol>
6	What are input devices	Input devices feed data into the computer. The keyboard is the most common input device. Other input devices include pointing devices like the mouse and trackball.
7	What are output devices	Output devices produce output through two main types of devices: monitor screens for immediate visual output and printers for permanent paper output.
8	What is a processor?	A processor or CPU (Central Processing Unit) processes information, performs all the necessary arithmetic calculations and make decisions based on information values.
9	What are the advantages of customizing your desktop configuration?	The most used programs are easily accessible in one area, and if you plan to run more than one program at a time, it is better to have them in the same group window.
10	Name 2 data types and describe their characteristics.	<ul style="list-style-type: none"> <li>✓ <b>Categorical data</b> Categorical data represents characteristics. Therefore, it can represent things like a person's gender, language etc. Categorical data can also take on numerical values (Example: 1 for female and 0 for male). Note that those numbers don't have mathematical meaning</li> <li>✓ <b>Nominal data</b> Nominal values represent discrete units and are used to label variables, that have no quantitative value. Just think of them as „labels “. Note that nominal data that has no order. Therefore if you would change the order of its values, the meaning would not change.</li> </ul>
11	Why are data types important?	Datatypes are an important concept because statistical methods can only be used with certain data types. You have to analyze

		continuous data differently than categorical data otherwise it would result in a wrong analysis. Therefore knowing the types of data you are dealing with, enables you to choose the correct method of analysis.
12	What are the basic aspects of information retrieval?	<ul style="list-style-type: none"> <li>✓ Information storage and organization</li> <li>✓ Information representation</li> <li>✓ Information access.</li> </ul>
13	Name two information retrieval techniques	<ol style="list-style-type: none"> <li>1. Basic Retrieval Techniques</li> <li>2. Advanced Retrieval Techniques</li> </ol>
14	How do you make sure the efficiency of equipment's?	Exercising preventive maintenance measures such as systematic and routine cleaning, adjustment and replacement of equipment parts at scheduled intervals. Manufacturers generally recommend a set of equipment maintenance tasks that should be performed at regular intervals: daily, weekly, monthly or yearly. Following these recommendations will ensure that the equipment performs at maximum efficiency
15	What is HTML?	Hyper Text Markup Language or HTML is a very simple language having a number of options to represent text. Many other scripting languages have now been developed which can be embedded into HTML, giving it the power to interact with the users
16	The internet is extensively used for a wide variety of purposes. Name any 3.	<ol style="list-style-type: none"> <li>1. Search for information</li> <li>2. Send and receive Emails</li> <li>3. Teleconferencing</li> </ol>
17	What are steps involved in sending an Email?	<ol style="list-style-type: none"> <li>1. Click on "Compose"</li> <li>2. Enter the e-mail address of the receiver against any of the three options - To, CC and BCC.</li> <li>3. Write in the message in the text box as indicated in the figure</li> <li>4. After typing in the message click on send option</li> </ol>
18	What are steps involved in shutting down the computer?	<ol style="list-style-type: none"> <li>1. Click the Windows Icon at the lower left side of the screen.</li> <li>2. Click Shutdown button</li> </ol> <p><b>OR</b></p> <p>Press Ctrl+Alt+Del and click the power button in the bottom-right corner of the screen.</p>

## 2. PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to planning operate computer to enter, manipulate, and retrieve and to access data and communicate via the Internet., 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"> <li>✓ Initiate computer system</li> <li>✓ Enter data</li> <li>✓ Retrieve data</li> <li>✓ Amend data</li> <li>✓ Monitor the operation of equipment</li> <li>✓ Access and transmit information via the Internet</li> <li>✓ Close down computer system</li> </ul>
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"> <li>✓ Initiate computer system</li> <li>✓ Enter data</li> <li>✓ Retrieve data</li> <li>✓ Amend data</li> <li>✓ Monitor the operation of equipment</li> <li>✓ Access and transmit information via the Internet</li> </ul>
4	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.
5	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. OW =Observation at work Place

#	Activity to be observed	Assess and evaluate performance of the activities
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"> <li>✓ Initiate computer system</li> <li>✓ Enter data</li> <li>✓ Retrieve data</li> <li>✓ Amend data</li> <li>✓ Monitor the operation of equipment</li> <li>✓ Access and transmit information via the Internet</li> </ul>
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 their own work where tasks involve one or more steps or functions and are carried out routinely on a regular basis.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	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	Initiate computer system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ The hardware components of the computer and their functions are correctly identified.</li> <li>✓ Equipment is powered up correctly</li> <li>✓ Access codes are correctly applied.</li> <li>✓ Appropriate software is selected or loaded from the menu.</li> </ul>
2	Enter data	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Types of data for entry correctly identified and collected</li> <li>✓ Input devices selected and used are appropriate for the intended operations.</li> <li>✓ Manipulative procedures of Input device conform to established practices.</li> <li>✓ Computer files are correctly located or new files are created, named and saved</li> <li>✓ Data is accurately entered in the appropriate files using specified procedure and format.</li> <li>✓ Back-up made in accordance with operative procedures.</li> </ul>
3	Retrieve data	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ The identity and source of information is established.</li> <li>✓ Authority to access data is obtained where required.</li> <li>✓ Files and data are correctly located and accessed.</li> <li>✓ Integrity and confidentiality of data are maintained</li> </ul>

		<ul style="list-style-type: none"> <li>✓ The relevant reports or information retrieved using approved procedure</li> <li>✓ Formats of retrieved report or information 18 conform to that required</li> <li>✓ Copy of the data is printed where required</li> </ul>
4	Amend data	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Source of data/information for amendment is established.</li> <li>✓ Data to be amended is correctly located within the file</li> <li>✓ The correct data/information is entered, changed or deleted using appropriate input device and approved procedures.</li> <li>✓ The Integrity of data is maintained.</li> </ul>
5	Monitor the operation of equipment	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ The system is monitored for correct operation of tasks.</li> <li>✓ Routine system messages are promptly and correctly dealt with</li> <li>✓ Error conditions within level of authority are dealt with promptly and uncorrected errors are promptly reported.</li> <li>✓ Output devices and materials are monitored for quality</li> </ul>
6	Access and transmit information via the Internet	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Access to the Internet is gained in accordance with the provider's operating procedures.</li> <li>✓ Evidence of the ability to negotiate web sites to locate and access specified information and other services is efficiently demonstrated.</li> <li>✓ E-mail is sent and retrieved competently</li> </ul>
7	Close down computer system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ The correct shut down sequence is followed.</li> <li>✓ Problem with shutting down computer is reported promptly.</li> <li>✓ Problem with shutting down computer is reported promptly.</li> </ul>

## 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: Apply mathematics for water operations

Unit No	04
Unit Title	Apply mathematics for water operations
Unit Code	CONCM11V1/21

### 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 *
<b>1. Perform simple mathematic calculations</b>							
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	✓	✓	✓	✓		✓	✓
<b>2. Apply knowledge of mathematics in water operations</b>							
Identify and use units of Measurement	✓	✓	✓	✓		✓	✓
Perform calculations on: Conversion Factors, Weight, Concentration, and Flow	✓		✓	✓	✓		✓
Perform mathematical calculations involving Typical Water/Wastewater Conversion Examples	✓	✓	✓	✓		✓	✓
Perform Temperature Conversions and Population Equivalent (PE) or Unit Loading Factor	✓		✓	✓	✓		✓
Perform calculations on: Specific Gravity and Density, Flow and Detention Time	✓	✓	✓	✓		✓	✓
Perform chemical Addition Conversions	✓		✓	✓	✓		✓
<b>3. Undertake water/wastewater calculations</b>							
Perform Faucet Flow Estimation	✓	✓	✓	✓		✓	✓
Calculate Service Line Flushing Time	✓		✓	✓	✓		✓

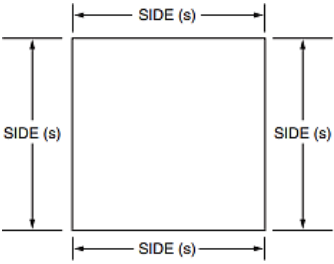
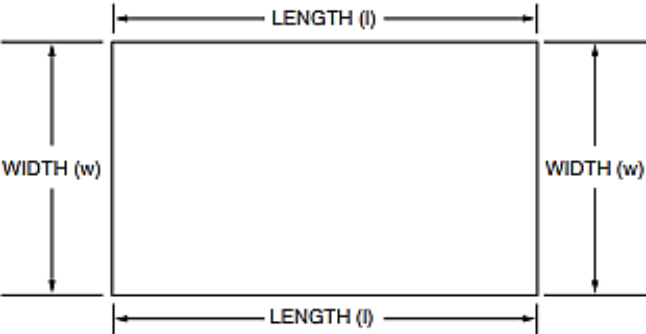
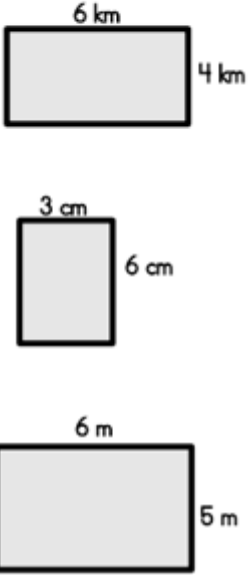
Perform Composite Sampling Calculation (Proportioning Factor) and Biochemical Oxygen Demand (BOD) Calculations	✓	✓	✓	✓		✓	✓
Perform mathematical calculations on Moles and Molarity, Normality, Settleability (Activated Biosolids Solids), Settleable Solids, Biosolids Total Solids, Fixed Solids, and Volatile Solids	✓		✓	✓	✓		✓
Calculate Biosolids Volume Index (BVI) and Biosolids Density Index (BDI)	✓	✓	✓	✓		✓	✓

**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 2 types of fractions?	1. Common fractions 2. Decimal fractions
2	What is a denominator?	The bottom number (the denominator) of every fraction shows the number of pieces any one whole object is divided into; all pieces are of equal size
3	What is the top number of a fraction called?	A numerator.
4	What is a decimal point?	A decimal point separates the whole numbers from the parts, and the whole numbers are always to the left of the decimal point.
5	Round off the following to tenths ✓ .68 ✓ .64	✓ 7 ✓ 6
6	Round off the following to hundredths ✓ .357 ✓ .351	✓ .36 ✓ .35
7	What are significant figures?	The significant figures of a number are <a href="#">digits</a> that carry meaning contributing to its <a href="#">measurement resolution</a> .
8	What are the base units used for the following? 1. Mass 2. Length 3. Time	1. Kilogram (kg) 2. Meter (m) 3. Second 4. Kelvin (K)

	4. Temperature	
9	How would you identify a square? Illustrate.	<p>All four sides are of equal length, and all four angles are 90°.</p> 
10	How would you identify a Rectangle? Illustrate.	<p>The lengths are equal only to each other and the widths are equal only to each other. All four angles are 90°.</p> 
11	<p>Find the area of the following</p> 	<p>✓ <math>A=L \times H</math>  <math>= 6 \times 4</math>  <math>= 24</math></p> <p>✓ <math>A=L \times H</math>  <math>= 3 \times 6</math>  <math>= 18</math></p> <p>✓ <math>A=L \times H</math>  <math>= 6 \times 5</math>  <math>= 30</math></p>

12	A cuboid measures 16 cm by 13 cm by 9 cm. Find the capacity of the cuboid. Give your answers in liters.	<p>Solution:</p> $\text{Volume} = 16 \times 13 \times 9 = 1872 \text{ cm}^3.$
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## 2. PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to: Use calculation to solve simple problems, construct plane figures, and develop patterns., 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"> <li>✓ Perform simple mathematic calculations</li> <li>✓ Apply knowledge of mathematics in water operations</li> <li>✓ Undertake water/wastewater calculations</li> </ul>
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"> <li>✓ Perform simple mathematic calculations</li> <li>✓ Apply knowledge of mathematics in water operations</li> <li>✓ Undertake water/wastewater calculations</li> </ul>
4	Use calculations to solve simple problems	While answering, make sure they use correct formulas while calculating perimeter, area, volume and other mathematical calculations.

## 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"> <li>✓ Perform simple mathematic calculations</li> <li>✓ Apply knowledge of mathematics in water operations</li> <li>✓ Undertake water/wastewater calculations</li> </ul>

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 planning their own work where tasks involve one or more steps or functions and are carried out routinely on a regular basis.  Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.
4	Apply knowledge of mathematics in water operations	Assessor can verbally ask questions on the identification of unit measurements and how to perform calculations on Conversion Factors, Weight, Concentration, and Flow

#### 4. OQ=Oral Questioning

#	Oral questioning activities	Answers
1	Perform simple mathematic calculations	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ Perform simple calculations on: fractions and decimals, calculations to a number of significant figures, decimal places</li> <li>✓ Identify and use the multiples and sub-multiples of units</li> <li>✓ 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)</li> <li>✓ Perform mathematical calculations involving formulas, angles, triangles and geometric construction</li> <li>✓ Identify and use formulas for SI quantities: length, area, volume, mass, density</li> </ul>
2	Apply knowledge of mathematics in water operations	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ Identify and use units of Measurement</li> <li>✓ Perform calculations on: Conversion Factors, Weight, Concentration, and Flow</li> <li>✓ Perform mathematical calculations involving Typical Water/Wastewater Conversion Examples</li> <li>✓ Perform Temperature Conversions and Population Equivalent (PE) or Unit Loading Factor</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Perform calculations on: Specific Gravity and Density, Flow and Detention Time</li> <li>✓ Perform chemical Addition Conversions</li> </ul>
3	Undertake water/wastewater calculations	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Perform Faucet Flow Estimation</li> <li>✓ Calculate Service Line Flushing Time</li> <li>✓ Perform Composite Sampling Calculation (Proportioning Factor) and Biochemical Oxygen Demand (BOD) Calculations</li> <li>✓ Perform mathematical calculations on Moles and Molarity, Normality, Settleability (Activated Biosolids Solids), Settleable Solids, Biosolids Total Solids, Fixed Solids, and Volatile Solids</li> <li>✓ Calculate Biosolids Volume Index (BVI) and Biosolids Density Index (BDI)</li> </ul>

### 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-5: Prepare basic technical drawing

Unit No                      05  
 Unit Title                    Prepare basic technical drawing  
 Unit Code                    CONS05CR01V1/21

### 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 *
<b>1. Identify drawing requirements</b>							
Requirements and purpose of drawing are determined from customer and/or work specification and associated documents	✓	✓	✓	✓		✓	✓
All data necessary to produce the drawing is identified and collected	✓		✓	✓	✓		✓
Drawing requirements are confirmed with relevant personnel and timeframes for completion are established	✓	✓	✓	✓		✓	✓
<b>2. Develop knowledge and proper techniques in preparing drawings and sketches</b>							
Drafting equipment is selected appropriate to the drawing method chosen	✓	✓	✓	✓		✓	✓
Drafting principles are applied to produce a drawing that is consistent with standard operating procedures within the enterprise	✓		✓	✓	✓		✓
All work is undertaken safely and to prescribed procedure	✓	✓	✓	✓		✓	✓
Completed drawing is approved in accordance with standard operating procedures	✓		✓	✓	✓		✓
<b>3. Perform drawing and sketches to workplace requirements</b>							
Drawings and or parts lists records are completed in accordance with standard operating procedures	✓		✓	✓	✓		✓
Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures	✓	✓	✓	✓		✓	✓
Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures	✓		✓	✓	✓		✓

**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	Briefly explain the first step of requirements gathering.	Often the first step for that should be to determine what the roles and responsibilities should be during this phase of the project. While the project manager would normally be responsible for the requirements of the project, it should typically be the customer, or an analyst, who is responsible for the requirements of the product. Even though the same person may play both roles, their overall responsibilities are different and it is important to be aware of which role is involved in what steps.
2	What is the project scope?	The project scope defines how the product (or service) will be developed while the product scope defines the actual functions and features of that same product.
3	What has the traditional focus in project management been on?	The traditional focus in project management has been on developing a product faster, cheaper, and better.
4	Why has the traditional focus in project management been changing?	This is changing through the popularity of agile approaches where it is assumed that the customer does not have a clear understanding of what they want up front, but rather that requirements gathering is a discovery process, where the customer gradually discovers the product requirements through iterations, prototyping and modelling.
5	Identify four techniques that are considered when determining the right approach.	<ul style="list-style-type: none"> <li>✓ One-on-one interviews</li> <li>✓ Surveys</li> <li>✓ Job shadowing or observation</li> <li>✓ Facilitated sessions/JAD (Joint Application Development) sessions</li> </ul>
6	What does JAD sessions stand for?	Joint application design sessions.
7	What are JAD sessions?	JAD is a techniques largely focused on group dynamics and team synergy, it is important to get the right people involved.
8	What key people are required for a JAD session?	<ul style="list-style-type: none"> <li>✓ Facilitator</li> <li>✓ Scribe</li> <li>✓ Analyst</li> <li>✓ Customer</li> </ul>
9	Explain the role of the facilitator in a JAD session.	The facilitator should be selected based on their ability to work with and lead a group of people in consensus building. They should be neutral to the outcome of the session, meaning that they should not have a vested impact in steering the discussion in a certain direction. This normally means that the project manager or the developers do not make good facilitators. Ideally, it should be a person that has a general understanding of the customer’s business areas, who is comfortable with modeling



		<p>techniques that are to be used in the session and who can deal with a group of disagreeing people and move them along in the decision process.</p> <p>While the facilitator is not the most important person for the project, they are the one with the most influence on the success of the JAD session itself. They need to be able to sense how the JAD team is functioning, to deal with conflicts, and to make sure that the goals of the session are being met.</p>
10	Explain the role of the scribe in a JAD session.	<p>The scribe, or scribes, will capture the key decisions, and the rationale behind those decisions. If a 3-day JAD session is being held and at the end there is no documentation of the outcome, then everyone has just wasted 3 days. Have one scribe focus on conversations and one on models. This will improve the odds of catching everything important. The scribe must have good listening skills and must understand the business that is being discussed. You don't want constant interruptions from the scribe, requesting clarifications of items that are well understood by the rest of the room.</p>
11	Explain the role of the facilitator in a JAD session.	<p>The analyst is the person focusing on capturing the right information. Often the analyst will also be the facilitator, but when that happens they are playing two different roles. The facilitator is focusing on getting the group to consensus and to meet the session goals while the analyst is there to make sure that the right questions are asked and that the models correctly identify the business. The analyst is really more of a subject matter expert on the customer's business.</p>
12	Explain the role of the facilitator in a JAD session.	<p>Obviously you cannot hold a JAD session without a customer. While it is true that you may not be able to select your customer, there are ways to influence the selection of them. Identify the criteria that you are looking for and meet with management ahead of time and explain the importance of the role and the characteristics of the person that is needed.</p>
13	Identify four ground rules established for a JAD session.	<ul style="list-style-type: none"> <li>✓ Breaks and how to handle late comers</li> <li>✓ Decision process and how consensus is defined</li> <li>✓ What to do when a topic goes longer than the agenda</li> <li>✓ Rules to deal with participants monopolizing the conversation</li> </ul>
14	Explain the Parking Lot concept.	<p>A parking lot serves two main purposes, first, it allows the team to capture important information that should be addressed, but not by this team at this time. The second benefit is for the facilitator. It allows moving a person off a topic which is not in line with the goals of the session. There may not be intent to ever re-visit the topic again, but by putting it in writing and making it visible, it may allow the team to put the topic aside.</p>
15	Explain the forming stage.	<p>In the forming stage, the team is insecure and needs a lot of guidance. Team building and clear assignments are important for this stage.</p>
16	Explain the storming stage.	<p>In the storming stage the team is now trying to assess the competency of other team members and figure out where they fit. The facilitator needs to let the team storm, while making sure that the ground rules are being followed.</p>

17	Explain the norming stage.	In the norming stage the team is falling in to natural roles and responsibilities and the team starts to find its purposes.
18	Explain the performing stage.	When that has been sorted out the team is in the performing stage. In real life the team will move back and forth between these stages and the facilitator should adjust their facilitation style based on that.
19	List the key steps of implementing a JAD approach.	<ol style="list-style-type: none"> <li>1. Sell it to your management to the customer. If you don't get buy-in this will fail, so make sure you put together a good sales presentation.</li> <li>2. Train your core team on the techniques you'll be using (could be Process Modeling, Data Modeling, Prototyping, etc.)</li> <li>3. Train some facilitators (select people that can lead a discussion, not necessarily the ones that want to do the most talking)</li> <li>4. Pick a pilot project. Pick something not too large, something that you can afford to learn one and work through.</li> <li>5. Train all participants (the users in the sessions have to understand the technique)</li> <li>6. Schedule and run the pilot session.</li> <li>7. Do an extensive lessons and learned session.</li> </ol>
20	Identify the different types of views in basic engineering drawing.	<ul style="list-style-type: none"> <li>✓ Isometric view</li> <li>✓ Orthographic view</li> <li>✓ Orthographic projection (ISO standard)</li> <li>✓ Flat pattern</li> <li>✓ Section view</li> <li>✓ Cutout view</li> <li>✓ Detail view</li> <li>✓ Auxiliary view</li> </ul>
21	Explain isometric view.	<p>Isometric drawings show parts as three-dimensional. All the vertical lines stay vertical (compared to front view) and otherwise parallel lines are shown on a 30-degree angle.</p> <p>The lines that are vertical and parallel are in their true length. Which means you can use a ruler and the scaling of the drawing to easily measure the length straight from a paper drawing, for example. The same does not apply to angled lines.</p> <p>It is important to distinguish the isometric view from a perspective view. A perspective view is an artistic one that represents an object as it seems to the eye. Engineers stay true to the dimensions rather than optical illusions.</p>
22	Explain orthographic projection (ISO standard).	<p>The most common way to communicate all the information is by using three different views in a multiview drawing:</p> <ul style="list-style-type: none"> <li>✓ Front view</li> <li>✓ Top view</li> <li>✓ Side view</li> </ul> <p>It may be possible that some additional views are necessary to show all the info. But again, less is more.</p>

		The positioning of the views differs a bit regionally. For example, look at the image below to compare the US and ISO layouts.
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## 2. PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to preparing basic technical drawing, 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"> <li>✓ Identify drawing requirements</li> <li>✓ Develop knowledge and proper techniques in preparing drawings and sketches</li> <li>✓ Perform drawing and sketches to workplace requirements</li> </ul>
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"> <li>✓ Identify drawing requirements</li> <li>✓ Develop knowledge and proper techniques in preparing drawings and sketches</li> <li>✓ Perform drawing and sketches to workplace requirements</li> </ul>
4	Demonstrate four methods by which you can identify drawing requirements	The student is expected to follow the correct step-by step processes of methods to identify drawing requirements. The elements which should be assessed are: <ul style="list-style-type: none"> <li>✓ One-on-one interviews</li> <li>✓ Surveys</li> <li>✓ Job shadowing or observation</li> <li>✓ JAD (Joint Application Development) sessions</li> </ul>

## 3. OW =Observation at work Place

#	Activity to be observed	Assess and evaluate performance of the activities
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"> <li>✓ Identify drawing requirements</li> <li>✓ Develop knowledge and proper techniques in preparing drawings and sketches</li> <li>✓ Perform drawing and sketches to workplace requirements</li> </ul>
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 identifying the drawing requirements, preparing or making changes to engineering drawings, preparing an engineering parts list and issuing the 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 implement a JAD approach	As the students attend the practical test to assess their skill in implementing a JAD approach, make sure the student use the proper techniques and the information he shared is accurate.

#### 4. OQ=Oral Questioning

#	Questions	Answers
1	Identify drawing requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Requirements and purpose of drawing are determined from customer and/or work specification and associated documents.</li> <li>✓ All data necessary to produce the drawing is identified and collected.</li> <li>✓ Drawing requirements are confirmed with relevant personnel and timeframes for completion are established.</li> </ul>
2	Develop knowledge and proper techniques in preparing drawings and sketches	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Drafting equipment is selected appropriate to the drawing method chosen.</li> <li>✓ Drafting principles are applied to produce a drawing that is consistent with standard operating procedures within the enterprise.</li> <li>✓ All work is undertaken safely and to prescribed procedure.</li> <li>✓ Completed drawing is approved in accordance with standard operating procedures.</li> </ul>
3	Perform drawing and sketches to workplace requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Drawings and or parts lists records are completed in accordance with standard operating procedures.</li> <li>✓ Approved drawings and or parts lists are copied and issued to relevant personnel in accordance with standard operating procedures.</li> <li>✓ Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.</li> </ul>

## 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-6: Apply science for Water Operations

Unit No 06  
 Unit Title Apply science for Water Operations  
 Unit Code CONS05CR02V1/21

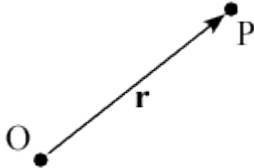
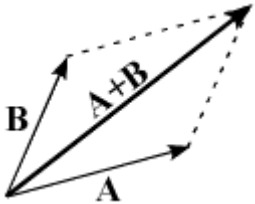
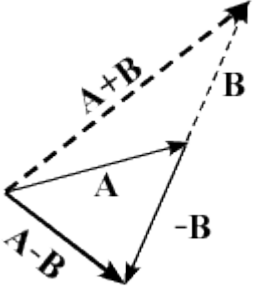
### Evidence Matrix

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 *
<b>1. Apply principals and theories of physics in real world</b>							
Perform scalars and vector arithmetic	✓	✓	✓	✓		✓	✓
Understand kinetics and perform simple calculations	✓		✓	✓	✓		✓
Understandcirculationmotion,and governing laws	✓	✓	✓	✓		✓	✓
Understand and apply the laws of Forces in real world examples	✓		✓	✓	✓		✓
Understand the Conservation of Energy principals and apply in real world	✓	✓	✓	✓		✓	✓
Understand the momentum and impulse	✓		✓	✓	✓		✓
Understand kinematics	✓	✓	✓	✓		✓	✓
Understand wave principals	✓		✓	✓	✓		✓
<b>2. Apply principals and theories of chemistry in real world examples</b>							
Understanding matter: <ul style="list-style-type: none"> <li>States of matter, and properties related to it</li> <li>Pure substances and mixtures</li> </ul>	✓	✓	✓	✓		✓	✓
Understanding atoms, molecules, elements and compounds, and basic understanding of chemical reactions	✓		✓	✓	✓		✓
Understanding solvents, solutions, saturation facts, and concentration limits	✓	✓	✓	✓		✓	✓
Observing properties of acids and bases, and understanding strong and weak acids	✓		✓	✓	✓		✓

**Note:**

- ✓ "Other Sources" meant that Assessor can choose evidence from other sources such as S=supervisor/team leader report, C = CertificatesT=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 scalars.	Scalars are mathematical entities which have only a magnitude- (and no direction).
2	List two examples of scalar quantities.	Physical examples include mass and energy.
3	Define vectors.	Vectors are mathematical entities which have both a magnitude and a direction.
4	List two examples of vector quantities.	Physical examples include forces, velocities, momenta and locations.
5	What is the notation of a scalar unit?	Plain (or often italicized) letters: $a$ , $k$ , etc.
6	What is the notation of a vector unit?	Either bold letters: $\mathbf{x}, \mathbf{v}$ (often used in books), or a small vector sign: $\vec{x}$
7	What is the magnitude of a vector?	$A \equiv  A $
8	Show the position vector of a given location P.	 <p>A diagram showing a point O (origin) and a point P. A vector labeled <math>\mathbf{r}</math> points from O to P.</p>
9	How do you add vectors? Explain with a diagram.	<p>The sum of two vectors is defined as the diagonal of the parallelogram formed when the two vectors <math>\mathbf{A}</math> and <math>\mathbf{B}</math> are placed at the same point, as is described in the diagram. Evidently, we see that the addition is commutative, that is, the order is not important: <math>\mathbf{A} + \mathbf{B} = \mathbf{B} + \mathbf{A}</math>.</p>  <p>A diagram showing two vectors <math>\mathbf{A}</math> and <math>\mathbf{B}</math> originating from the same point. Dashed lines complete a parallelogram. The diagonal vector is labeled <math>\mathbf{A} + \mathbf{B}</math>.</p>
10	How do you subtract vectors? Explain with a diagram.	<p>Vector subtraction <math>\mathbf{A} - \mathbf{B}</math> is defined as: <math>\mathbf{A} + (-\mathbf{B})</math>, that is, adding the negative of the subtracted vector <math>\mathbf{B}</math>, as is apparent in the figure.</p>  <p>A diagram showing vector <math>\mathbf{A}</math> and vector <math>-\mathbf{B}</math> (the negative of vector <math>\mathbf{B}</math>) originating from the same point. A dashed vector labeled <math>\mathbf{A} + \mathbf{B}</math> connects the tip of <math>-\mathbf{B}</math> to the tip of <math>\mathbf{A}</math>. A solid vector labeled <math>\mathbf{A} - \mathbf{B}</math> is shown as the resultant of <math>\mathbf{A}</math> and <math>-\mathbf{B}</math>.</p>
11	Explain the concept of vector distributivity with a diagram.	<p>The graphical definition of vector addition also implies a very important characteristic: Vector addition is distributive, that is <math>\mathbf{A} + (\mathbf{B} + \mathbf{C}) = (\mathbf{A} + \mathbf{B}) + \mathbf{C}</math>. In other words, when we add three vectors, it does not matter whether we add the first pair first, or</p>

		<p>the second pair first. This is demonstrated in the following figure.</p>
12	Explain how to multiply by a scalar with a diagram.	<p>Multiplying a vector by a scalar gives a new vector with the same direction but with a magnitude which is multiplied by the scalar. A negative scalar would yield a vector in the opposite direction as the original vector. For example: <math>(-1)A = -A</math>.</p>
13	Define distance.	Distance is a scalar quantity that refers to "how much ground an object has covered" during its motion.
14	Define displacement.	Displacement is a vector quantity that refers to "how far out of place an object is"; it is the object's overall change in position.
15	Define speed.	Speed can be thought of as the rate at which an object covers distance.
16	Define velocity.	Velocity is a vector quantity that refers to the rate at which an object changes its position.
17	What is the equation used to calculate average speed?	$\text{Average Speed} = \frac{\text{Distance Traveled}}{\text{Time of Travel}}$
18	What is the equation used to calculate average velocity?	$\text{Average Velocity} = \frac{\Delta \text{position}}{\text{time}} = \frac{\text{displacement}}{\text{time}}$
19	Define instantaneous speed.	The speed at any given instant in time.
20	Define average speed.	The average of all instantaneous speeds; found simply by a distance/time ratio.
21	Define acceleration.	Acceleration is a vector quantity that is defined as the rate at which an object changes its velocity.
22	Define constant acceleration.	This is referred to as a constant acceleration since the velocity is changing by a constant amount each second.
23	What is the equation used to find average acceleration?	$\text{Ave. acceleration} = \frac{\Delta \text{velocity}}{\text{time}} = \frac{v_f - v_i}{t}$
24	Identify the three types of matter and explain their properties.	<ul style="list-style-type: none"> <li>✓ Solid: a substance that retains its size and shape without a container; a substance whose molecules cannot move freely except to vibrate.</li> <li>✓ Gas: a substance that can only be contained if it is fully surrounded by a container (or held together by gravitational pull); a substance whose molecules have negligible intermolecular interactions and can move freely.</li> </ul>



		✓ Liquid: a substance that flows and keeps no definite shape because its molecules are loosely packed and constantly moving. It takes the shape of its container but maintains constant volume.
25	Define chemical element.	A chemical element is a pure substance that consists of one type of atom.
26	Describe properties of metals.	<ul style="list-style-type: none"> <li>✓ Often conductive to electricity</li> <li>✓ Malleable</li> <li>✓ Shiny</li> <li>✓ Sometimes magnetic.</li> </ul>
27	Describe properties of non-metals.	<ul style="list-style-type: none"> <li>✓ Typically not conductive</li> <li>✓ Not malleable</li> <li>✓ Dull (not shiny)</li> <li>✓ Not magnetic.</li> </ul>
28	Define chemical compound.	When two distinct elements are chemically combined—i.e., chemical bonds form between their atoms—the result is called a chemical compound.
29	Describe properties of chemical compounds.	<ul style="list-style-type: none"> <li>✓ Molecular compounds held together by covalent bonds</li> <li>✓ Salts held together by ionic bonds</li> <li>✓ Intermetallic compounds held together by metallic bonds</li> <li>✓ Complexes held together by coordinate covalent bonds.</li> </ul>
30	Define solution.	A solution in chemistry is a homogenous mixture of two or more substances.
31	Define solvent.	The substance which is dissolved is called a solute
32	Define solute.	The substance in which the solute is dissolved is called a solvent.

### 1. PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to applying science for water operations, 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"> <li>✓ Apply principals and theories of physics in real world</li> <li>✓ Apply principals and theories of chemistry in real world examples</li> </ul>
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"> <li>✓ Apply principals and theories of physics in real world</li> <li>✓ Apply principals and theories of chemistry in real world examples</li> </ul>
4	Demonstrate Newton's Third Law can be proved with examples	The student is expected to follow the correct step-by step process to proving Newton's Third Law. The elements which should be assessed are:

		Consider the flying motion of birds. A bird flies by use of its wings. The wings of a bird push air downwards. Since forces result from mutual interactions, the air must also be pushing the bird upwards. The size of the force on the air equals the size of the force on the bird; the direction of the force on the air (downwards) is opposite the direction of the force on the bird (upwards). For every action, there is an equal (in size) and opposite (in direction) reaction. Action-reaction force pairs make it possible for birds to fly.
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## 2. OW = Observation at work Place

#	Activity to be observed	Assess and evaluate performance of the activities
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"> <li>✓ Apply principals and theories of physics in real world</li> <li>✓ Apply principals and theories of chemistry in real world examples</li> </ul>
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 fundamental laws of science with routine tasks and work environment.  Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.
4	Presentation on states of matter	As the students attend the practical test to assess their knowledge in differentiating between the states of matter, make sure the student use the proper techniques and the information he shared is accurate.

## 3. OQ=Oral Questioning

#	Questions	Answers
1	Apply principals and theories of physics in real world	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ Perform scalars and vector arithmetic</li> <li>✓ Understand kinetics and perform simple calculations</li> <li>✓ Understand circulation motion, and governing laws</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Understand and apply the laws of Forces in real world examples</li> <li>✓ Understand the Conservation of Energy principals and apply in real world</li> <li>✓ Understand the momentum and impulse</li> <li>✓ Understand kinematics</li> <li>✓ Understand wave principals</li> </ul>
2	Apply principals and theories of chemistry in real world examples	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Understanding matter:</li> <li>✓ States of matter, and properties related to it</li> <li>✓ Pure substances and mixtures</li> <li>✓ Understanding atoms, molecules, elements and compounds, and basic understanding of chemical reactions</li> <li>✓ Understanding solvents, solutions, saturation facts, and concentration limits</li> <li>✓ Observing properties of acids and bases, and</li> <li>✓ understanding strong and weak acids</li> </ul>

#### 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	<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: Plan to undertake a routine task

Unit No 07  
 Unit Title Plan to undertake a routine task  
 Unit Code CONS05CR03V1/21

### 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 *
<b>1. Identify task requirements</b>							
Instructions and procedures are obtained, understood and where necessary clarified	✓	✓	✓	✓		✓	✓
Relevant specifications for task outcomes are obtained, understood and where necessary clarified	✓		✓	✓	✓		✓
Task outcomes are identified	✓	✓	✓	✓		✓	✓
Task requirements such as completion time and quality measures are identified	✓		✓	✓	✓		✓
<b>2. Plan steps required to complete task</b>							
Based on instructions and specifications provided, the individual steps or activities required to undertake the task are understood and where necessary clarified	✓	✓	✓	✓		✓	✓
Sequence of activities is identified	✓		✓	✓	✓		✓
Plan is checked to ensure it complies with specifications and task requirements	✓	✓	✓	✓		✓	✓
<b>3. Review plan</b>							
Effectiveness of plan is reviewed against specifications and task requirements	✓	✓	✓	✓		✓	✓
If necessary, plan is revised to better meet specifications and task 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 task analysis.	It is a structured framework that dissects a job and arrives at a reliable method of describing it across time and people by composing a detailed listing of all the tasks.
2	What does a task analysis contain?	<ul style="list-style-type: none"> <li>✓ Task frequency</li> <li>✓ Difficulty of learning</li> <li>✓ Importance to train</li> <li>✓ Task criticality</li> <li>✓ Task difficulty</li> <li>✓ Overall task importance</li> </ul>
3	Define task statement.	A task statement is composed of an action and a result (product).
4	What are task steps?	Task steps (also known as performance steps) are the step-by-step instructions for performing the process.
5	Demonstrate how to order manufacturing parts when the system flags a part as being low in stock	<ul style="list-style-type: none"> <li>✓ Look up usage for the item for the previous 12 month period.</li> <li>✓ Calculate the average monthly use.</li> <li>✓ Add the planned growth rate for the product line.</li> <li>✓ Check parts catalogs or call the source for best buy rates.</li> <li>✓ Check with planned usage tables or the business unit to ensure that the part will not go out of specifications for the best calculated buy period.</li> <li>✓ Place purchase order.</li> </ul>
6	List the four main methods for determining steps in a task analysis.	<ul style="list-style-type: none"> <li>✓ Hierarchical Task Analysis - arranging by order of actions</li> <li>✓ IF and THEN Analysis - If and then relationship</li> <li>✓ Model Based Analysis - possible actions listed</li> <li>✓ Cognitive Task Analysis - critical decision based</li> </ul>
7	IF text is a word, THEN?	<ul style="list-style-type: none"> <li>✓ move cursor to middle of word</li> <li>✓ double-click mouse button</li> </ul>
8	IF text is a section of words or letters, THEN?	<ul style="list-style-type: none"> <li>✓ move cursor to beginning of text</li> <li>✓ press mouse button down</li> <li>✓ move cursor to end of text</li> <li>✓ release mouse button</li> </ul>
9	What is the Model Based Analysis method used for?	This method is often used for professional tasks as the steps for performing certain tasks can be extremely vague to define.
10	List some acceptable techniques used in model based analysis.	<ul style="list-style-type: none"> <li>✓ use examples of others</li> <li>✓ have them form a picture in their minds of what they are trying to learn</li> <li>✓ help them gain and understand necessary information</li> <li>✓ apply the task to their job</li> <li>✓ present information using visual, auditory, and kinesthetic methods</li> <li>✓ practice the task</li> </ul>
12	Define cognitive task analysis.	A Cognitive Task Analysis is directed at the psychological processes underlying the performance and the subtle cues that may depend on context and experience.

13	What is the main goal of a cognitive task analysis?	To define the actual decision requirements of the task.
14	How can the actual decision requirements of the task be defined?	<ul style="list-style-type: none"> <li>✓ Mapping out the task using task analysis (traditional task analysis).</li> <li>✓ Identifying the critical decision points.</li> <li>✓ Clustering and linking the decision points.</li> <li>✓ Prioritizing the decision points.</li> <li>✓ Diagnosing and characterizing the decisions as to the strategies used, cues signaling the decision points, and the inferences made regarding cues and decision points.</li> </ul>
15	Explain the difference between task analysis and cognitive task analysis.	Task analysis focuses mainly on observable behavior and does not offer information on overall organization of knowledge. A cognitive task analysis is directed at the psychological processes underlying the behavior. Cognitive task analysis concentrates on the critical decisions and cognitive processes that separate the expert from the novice.
16	Define duties.	Duties are a combination of related or like tasks.
17	What is the purpose of team task analysis?	The purpose of the team task analysis will dictate if the focus is to be upon team tasks, team processes, individual task-work, or some combination of the three.
18	Identify the basic criteria incorporated into task management plans.	<ul style="list-style-type: none"> <li>✓ Time management,</li> <li>✓ Scheduling efficiency,</li> <li>✓ Data consolidation, and</li> <li>✓ Fluid communication</li> </ul>
19	List four ways task management can help you stay organized at work.	<ul style="list-style-type: none"> <li>✓ They help restructure big picture goals into smaller picture objectives.</li> <li>✓ They break those objectives into individual tasks and subtasks.</li> <li>✓ They lay out start dates, end dates, milestones, and timelines in a way that's easy to see and coordinate.</li> <li>✓ They make use of efficiency and productivity tools.</li> </ul>
20	Identify the steps in a task management plan.	<ol style="list-style-type: none"> <li>1. Rework big goals into small objectives</li> <li>2. Clarify objectives by converting them into a series of tasks</li> <li>3. Lay out and manage task timelines visually</li> <li>4. Take advantage of visual task management tools</li> </ol>
21	List some benefits of reviewing your plans.	<ul style="list-style-type: none"> <li>✓ Reviewing your plans helps limit decision fatigue</li> <li>✓ Reviewing your plans helps reveal assumptions that need to be adjusted</li> <li>✓ Reviewing your plans helps you proactively problem-solve and coordinate</li> <li>✓ Reviewing your plans helps you keep momentum on Big Projects</li> <li>✓ Reviewing your plans ultimately helps you save time</li> </ul>

## 2.PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to planning to undertake a routine task, 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"> <li>✓ Identify task requirements</li> <li>✓ Plan steps required to complete task</li> <li>✓ Review plan</li> </ul>
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"> <li>✓ Identify task requirements</li> <li>✓ Plan steps required to complete task</li> <li>✓ Review plan</li> </ul>
4	Demonstrate how to order manufacturing parts when the system flags a part as being low in stock	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"> <li>✓ Look up usage for the item for the previous 12 month period.</li> <li>✓ Calculate the average monthly use.</li> <li>✓ Add the planned growth rate for the product line.</li> <li>✓ Check parts catalogs or call the source for best buy rates.</li> <li>✓ Check with planned usage tables or the business unit to ensure that the part will not go out of specifications for the best calculated buy period.</li> <li>✓ Place purchase order.</li> </ul>

### 1. OW =Observation at work Place

#	Activity to be observed	Assess and evaluate performance of the activities
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"> <li>✓ Identify task requirements</li> <li>✓ Plan steps required to complete task</li> <li>✓ Review plan</li> </ul>
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 their own work where tasks involve one or more steps or functions and are carried out routinely on a regular basis.</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 If/Then Analysis	As the students attend the practical test to assess their knowledge regarding If/Then Analysis, make sure the student use the proper techniques and the information he shared is accurate.

## 2. OQ=Oral Questioning

#	Questions	Answers
1	Identify task requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Instructions and procedures are obtained, understood and where necessary clarified.</li> <li>✓ Relevant specifications for task outcomes are obtained, understood and where necessary clarified.</li> <li>✓ Task outcomes are identified.</li> <li>✓ Task requirements such as completion time and quality measures are identified.</li> </ul>
2	Plan steps required to complete task	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Based on instructions and specifications provided, the individual steps or activities required to undertake the task are understood and where necessary clarified.</li> <li>✓ Sequence of activities is identified.</li> <li>✓ Plan is checked to ensure it complies with specifications and task requirements.</li> </ul>
3	Review plan	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Effectiveness of plan is reviewed against specifications and task requirements.</li> <li>✓ If necessary, plan is revised to better meet specifications and task requirements.</li> </ul>

## 3. 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: Perform electrical service and maintenance

Unit No	08
Unit Title	Perform electrical service and maintenance
Unit Code	CONS05CR04V1/21

### 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 *
<b>1. Develop Fundamentals of electricity</b>							
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	✓		✓	✓	✓		✓
<b>2. Diagnose equipment</b>							
Carry out diagnostic tests according to workplace procedures and safety requirements without causing damage to components or systems	✓		✓	✓	✓		✓
Identify faults from diagnostic test results and determine causes of faults	✓	✓		✓	✓	✓	
Confirm and report diagnosis findings and develop recommendations for required repairs or adjustments according to workplace procedures	✓	✓	✓		✓	✓	✓
<b>3. Repair the equipment</b>							
Source and interpret repair information	✓		✓	✓	✓		✓
Analyse and select repair options required by the circumstances	✓	✓		✓	✓	✓	
Check and select repair tools, equipment and materials	✓	✓	✓		✓	✓	✓
Carry out repairs and component replacements and adjustments according to manufacturer specifications, workplace procedures and safety requirements, and without causing damage to components or systems	✓		✓	✓	✓		✓

Carry out post-repair testing according to workplace procedures to confirm fault rectification, and rectify any further problems introduced during the repair process	✓		✓	✓	✓		✓
<b>4. Complete work processes</b>							
Conduct final inspection according to workplace procedures and confirm equipment is ready for use	✓		✓	✓	✓		✓
Clear work area and dispose of or recycle materials according to workplace procedures	✓	✓		✓	✓	✓	
Complete documentation according to workplace procedures	✓	✓	✓		✓	✓	✓

**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 electric shock.	Electrical shock happens when current passes through the body.
2	How does electric shock happen?	When a person receives a shock, electricity flows between parts of the body or through the body to a ground. This can happen if someone touches both wires of an energized circuit, touches one wire of the circuit while standing unprotected or touches a metal part that has become energized.
3	What is electrocution?	Electrocution refers to the injury or lethal dose of electrical energy.
4	What does the severity of the injury depend on?	The severity of injury depends on the amount of current flowing through the body, the current's path through the body, the length of time the body remains in the circuit and the current's frequency.
5	Electrical fires can be caused by excessive resistance caused by what?	<ul style="list-style-type: none"> <li>✓ Too much current running through wiring where overcurrent protection fails or does not exist</li> <li>✓ Faulty electrical outlets resulting in poor contact or arcing</li> <li>✓ Poor wiring connections and old wiring that is damaged and cannot support the load</li> </ul>
6	In what situation can an explosion occur due to electricity?	An explosion can occur when electricity ignites a flammable gas or combustible dust mixture in the air. Ignition from a short circuit or static charge is possible.
7	Identify three electrical safety basics.	<ul style="list-style-type: none"> <li>✓ Don't work with exposed conductors carrying 50 volts or more.</li> <li>✓ Make sure electrical equipment is properly connected, grounded and in good working order.</li> <li>✓ Extension cords may not be used as permanent wiring and should be removed after temporary use for an activity or event.</li> <li>✓ Surge suppressors with built-in circuit breakers may be used long-term and are available with three, six and 15 foot-long cords.</li> </ul>

		<ul style="list-style-type: none"> <li>✓ High amperage equipment such as space heaters, portable air conditioners and other equipment must be plugged directly into permanent wall receptacles.</li> <li>✓ Do not access, use or alter any building's electrical service, including circuit breaker panels, unless you are specifically qualified and authorized to do so.</li> <li>✓ Wet environments can increase the risk of an electrical shock.</li> </ul>
8	Identify two points of housekeeping and maintenance that you should follow.	<ul style="list-style-type: none"> <li>✓ Maintain at least 30 inches of clearance in front of electrical panels to ensure a safe environment for facilities workers.</li> <li>✓ Make sure that all junction boxes are covered.</li> </ul>
9	What activities that require training should you avoid when trying to be safe?	<ul style="list-style-type: none"> <li>✓ Working with exposed conductors carrying 50 volts or more</li> <li>✓ Making repairs or alterations to any electrical equipment</li> <li>✓ Opening up the case, or removing barrier guards, of any equipment that utilizes electricity</li> <li>✓ Using any tools or a meter to measure for the presence of electricity</li> <li>✓ Resetting a tripped circuit breaker, or replace a blown fuse.</li> </ul>
10	What does grounding provide?	Electrical grounding provides an alternate path for electricity to follow, rather than going through a person.
11	What should you consider when it comes to using electricity in a wet location?	When using electricity in a wet or damp location, including outdoor locations, a Ground Fault Circuit Interrupter (GFCI) must be used. The GFCI ensures that any electrical shock is brief. Although painful, it wouldn't be fatal because the GFCI creates a ground fault or leak in the current.
12	Explain how electricity is caused.	Electrons are also bounded to atoms and orbiting around the nucleus at different distinct levels. But some of the electrons can move freely or can come out from their orbit due to external influences. These free and as well as loosely bonded electrons cause electricity.
13	Explain positive charge.	In neutral condition, the number of electrons and protons is the same in any piece of substance. But if somehow the number of electrons in a substance becomes more than the number of protons, the substance becomes negatively charged as the net charge of each electron is negative. If the number of electrons in a substance becomes less than the number of protons, the substance becomes positively charged.
14	Define electric current.	When charge flows from one point to another to make uniform charge distribution then the rate at which the charge is flowing called electric current.
15	What the rate of a electric current depend on?	This rate mainly depends on the difference between the charged condition of two points and the conditions of the pathway through which the charge is flowing.
16	What is the unit of electric current?	Ampere.
17	What is ampere?	Coulomb per second.
18	Define electric potential.	The level of charged condition of a body is known as electric potential.
19	The current flowing through a conductor is	The current flowing through a conductor is directly proportional to the difference of electric potential between at two ends of the conductor.

	directly proportional to what?	
20	Define electric field.	Space surrounds a charged body where another charged body can experience a force is called the electric field of the former body.
21	List the three basic ways in which electricity is produced.	<ul style="list-style-type: none"> <li>✓ Electromechanical process</li> <li>✓ Electrochemical process</li> <li>✓ Solid state electric generation</li> </ul>
22	Explain electromechanical process.	When a conductor moves in a magnetic field and the conductor cuts the field flux lines electricity is produced in the conductor. Depending on this principle all electrical generators work such as DC generators, alternators, and all kinds of dynamos.
23	Explain electrochemical process.	In all types of battery electricity is produced due to chemical reactions. Here chemical energy gets converted to electrical energy.
24	Explain solid state electric generation.	This is the most modern process of electricity generation. Here, free electrons and holes are generated at a PN junction and distribution of charge carriers gets imbalanced across the PN junction when the junction is exposed in the light. These free electrons and holes and their imbalanced distribution across the junction cause electricity in an external circuit. On this principle, PV solar cells work.
25	Identify and explain the types of electricity.	<ul style="list-style-type: none"> <li>✓ When electricity produced in the armature of a generator it is always alternating. That means polarity of electricity alters in a periodic interval. In DC generators the produced electricity in armature gets rectified through commutator. In alternators, the AC produced in the armature supplied to the external circuit through slip rings.</li> <li>✓ When electricity does not change its direction it is called DC electricity. Batteries and solar cells produce DC electricity.</li> </ul>

## 2.PT=Practical Test

#	Practical Activity	Points to evaluate
1	Student Assignments	Students need to undertake assignments related to performing electrical service and maintenance, 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"> <li>✓ Develop Fundamentals of electricity</li> <li>✓ Diagnose equipment</li> <li>✓ Repair the equipment</li> <li>✓ Complete work processes</li> </ul>
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"> <li>✓ Develop Fundamentals of electricity</li> <li>✓ Diagnose equipment</li> <li>✓ Repair the equipment</li> </ul>

		✓ Complete work processes
4	Demonstrate safety basics	<p>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:</p> <ul style="list-style-type: none"> <li>✓ Don't work with exposed conductors carrying 50 volts or more.</li> <li>✓ Make sure electrical equipment is properly connected, grounded and in good working order.</li> <li>✓ Extension cords may not be used as permanent wiring and should be removed after temporary use for an activity or event.</li> <li>✓ Surge suppressors with built-in circuit breakers may be used long-term and are available with three, six and 15 foot-long cords.</li> <li>✓ High amperage equipment such as space heaters, portable air conditioners and other equipment must be plugged directly into permanent wall receptacles.</li> <li>✓ Do not access, use or alter any building's electrical service, including circuit breaker panels, unless you are specifically qualified and authorized to do so.</li> <li>✓ Wet environments can increase the risk of an electrical shock.</li> </ul>

### 1. 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"> <li>✓ Develop Fundamentals of electricity</li> <li>✓ Diagnose equipment</li> <li>✓ Repair the equipment</li> <li>✓ Complete work processes</li> </ul>
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 electrical maintenance and troubleshooting of systems and component in within the sewerage sectors.</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 use five types of electrical tools	As the students attend the practical test to assess their knowledge regarding electrical tools and their functions, make sure the student use the proper techniques and the information he shared is accurate.
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## 2. OQ=Oral Questioning

#	Questions	Answers
1	Develop Fundamentals of electricity	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Interpret electrical safety</li> <li>✓ Familiarize with functions and applications of electrical tools and equipment</li> <li>✓ Perform simple electrical circuits</li> <li>✓ Perform electrical measurements using measuring devices on single phase and three phase equipment.</li> <li>✓ Diagnose faults on electrical connections on electrically operated appliances</li> </ul>
2	Diagnose equipment	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Carry out diagnostic tests according to workplace procedures and safety requirements without causing damage to components or systems</li> <li>✓ Identify faults from diagnostic test results and determine causes of faults</li> <li>✓ Confirm and report diagnosis findings and develop recommendations for required repairs or adjustments according to workplace procedures</li> </ul>
3	Repair the equipment	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Source and interpret repair information</li> <li>✓ Analyse and select repair options required by the circumstances</li> <li>✓ Check and select repair tools, equipment and materials</li> <li>✓ Carry out repairs and component replacements and adjustments according to manufacturer specifications, workplace procedures and safety requirements, and without causing damage to components or systems</li> <li>✓ Carry out post-repair testing according to workplace procedures to confirm fault rectification, and rectify any further problems introduced during the repair process</li> </ul>
4	Complete work processes	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Conduct final inspection according to workplace procedures and confirm equipment is ready for use</li> <li>✓ Clear work area and dispose of or recycle materials according to workplace procedures</li> <li>✓ Complete documentation according to workplace procedures</li> </ul>

### 3. 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-9: Perform Install, commission and repair pumps

Unit No	09
Unit Title	Perform Install, commission and repair pumps
Unit Code	CONS05CR05V1/21

### 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 *
<b>1. Identify scope of machine installation, commissioning or modification task</b>							
Examine machine and equipment drawings, manufacturer's manuals and other technical data on machines and equipment	✓		✓	✓	✓		✓
Determine performance and production requirements expected from machines and equipment after installation, commissioning or modification	✓	✓	✓	✓	✓	✓	✓
Determine relevant regulatory requirements		✓		✓		✓	
Inspect site and determine appropriateness of structural supports, ventilation, services, security and other critical requirements	✓	✓	✓	✓	✓	✓	✓
Determine mechanical, electrical, fabrication and machine control skills and task requirements		✓	✓			✓	✓
Produce or review installation, commissioning or modification schedule	✓	✓	✓	✓	✓	✓	✓
<b>2. Understand the ingredients and appropriate cooking techniques suitable for special dietary requirements</b>							
Distribute and discuss drawings, schedules, and major materials and equipment with team	✓		✓	✓	✓		✓
Arrange for request for further information (RFIs) with designers, where required	✓	✓	✓	✓	✓	✓	✓
Brief team on key compliance and risk factors, including regulatory, occupational health and safety (OHS) and environmental requirements		✓		✓		✓	
Agree with team on critical control points and reporting requirements	✓	✓	✓	✓	✓	✓	✓
<b>3. Identify and understand the impact of food preparation and cooking on the nutritional content of food</b>							

Supervise machine and equipment shutdowns required for task	✓		✓	✓	✓		✓
Supervise unloading of any new machines, equipment and materials required for task	✓	✓	✓	✓	✓	✓	✓
Check and determine that supply of services to work are adequate for task commencement		✓		✓		✓	
Ensure all tradespersons have correct drawing	✓	✓	✓	✓	✓	✓	✓
<b>4. Confirm special dietary requirements and select ingredients.</b>							
Establish procedures to ensure assembly and connections are against drawing specifications	✓		✓	✓	✓		✓
Ensure electrical, fluid power, and control systems and circuits are consistent with specifications and regulations	✓	✓	✓	✓	✓	✓	✓
Identify problems and contingencies and establish and rectify root cause		✓		✓		✓	
<b>5. Prepare, handle and store food according to hygiene standards</b>							
Conduct final check to ensure installation, commissioning or modification is consistent with drawings, manufacturer manuals and any regulatory requirements	✓		✓	✓	✓		✓
Follow procedures set by the establishment to avoid cross contamination due to bacteria, pests and chemical substances.	✓	✓	✓	✓	✓	✓	✓
Conduct test run of equipment		✓		✓		✓	
<b>6. Prepare, handle and store food according to hygiene standards</b>							
Brief client and operators on machine or equipment operation after installation	✓		✓	✓	✓		✓
Prepare and submit any required reports on installation, commissioning or modification	✓	✓	✓	✓	✓	✓	✓

**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 project scope.	The work that needs to be achieved to successfully deliver a service, product, or result with a specified set of functionalities and features.
2	Identify three aspects of project scope.	<ul style="list-style-type: none"> <li>✓ Project objectives</li> <li>✓ Project goals</li> <li>✓ Sub-phases</li> <li>✓ Tasks</li> <li>✓ Resources</li> <li>✓ Budget</li> <li>✓ Schedule</li> </ul>
3	List the steps needed to identify a project scope.	<ul style="list-style-type: none"> <li>✓ Identify project needs</li> <li>✓ Identify project objectives</li> <li>✓ Identify project expectations</li> <li>✓ Identify project constraints</li> </ul>
4	Explain how to identify project needs.	<p>The first step in the project scope checklist is to identify project needs. For this, you need to:</p> <ul style="list-style-type: none"> <li>✓ Establish a project timeline</li> <li>✓ Understand project resource allocation needs</li> <li>✓ Set project goals</li> </ul> <p>It is essential to understand project requirements to know what exactly needs to be done when trying to reach the end goal. Everything needs to be identified right from defining the project goal to determining the subtasks that need to be accomplished for achieving the end goal. Further, the resources needed to get all the work done need to be identified as well.</p>
5	Explain how to identify project objectives.	<p>Project objectives are the different business goals that a company wishes to achieve through their product or service. A few examples of project objectives include introducing a new product, developing new software, or creating a new service in an organization.</p> <p>SMART guidelines:</p> <p><b>Specific</b> – What are the project goals and objectives? Why and how will they be achieved?</p> <p><b>Measurable</b> – Can all of them be accounted for?</p> <p><b>Achievable</b> – Can it be accomplished with the available resources?</p> <p><b>Realistic</b> – Can it be easily delivered, irrespective of any complications?</p> <p><b>Time-bound</b> – Can everything be achieved in the set time frame?</p> <p>Make sure you have answers to all these questions before you proceed to the third step.</p>
6	Explain how to identify project expectations.	For the target audience, the main expectation is customer delight; that is how happy the customers are when using your product or service. This usually is determined by the product or service:

		<ul style="list-style-type: none"> <li>✓ Price</li> <li>✓ Quality</li> <li>✓ Availability</li> <li>✓ Policies</li> </ul>
7	Explain how to identify project constraints.	<p>Being aware of a project's limitations is as equally important as identifying its goals. This can minimize problems or issues faced during project execution, thereby preventing any delay in deliverables.</p> <p>A few things that can cause project constraints are:</p> <ul style="list-style-type: none"> <li>✓ Internal and external conditions</li> <li>✓ Dynamic environment</li> <li>✓ Technical glitches</li> <li>✓ Lack of resources</li> </ul>
8	The project scoping process consists of what three processes?	<ul style="list-style-type: none"> <li>✓ Planning</li> <li>✓ Controlling</li> <li>✓ Closing</li> </ul>
9	Explain planning as a part of the project scoping process.	<p>The first step in the project scoping process is to understand what needs to be done and plan projects accordingly.</p> <ul style="list-style-type: none"> <li>✓ Understand the project as a whole</li> <li>✓ Create subtasks that you will need to complete to deliver the project</li> <li>✓ Set quality standards</li> <li>✓ Define and delegate the work to respective teams</li> </ul>
10	Explain controlling as a part of the project scoping process.	<p>This step is a part of project execution. Once you've defined and delegated everything, the project execution starts. During this phase it is essential that you control and monitor everything efficiently.</p> <p>A few things you need to monitor during project execution include:</p> <ul style="list-style-type: none"> <li>✓ Documents</li> <li>✓ Project changes</li> <li>✓ Work progress</li> <li>✓ Quality checks</li> </ul>
11	Explain closing as a part of the project scoping process.	<p>The third and last process is "closing."</p> <p>This includes:</p> <ul style="list-style-type: none"> <li>✓ Auditing of all project deliverables</li> <li>✓ Assessment of project outcomes</li> <li>✓ Compare project outcome to estimated outcome</li> </ul>
12	Define team briefing.	<p>The Team Briefing is a regular face-to-face meeting between supervisors and their teams to systematically communicate and exchange information and ideas.</p>
13	List three benefits of a team briefing.	<ul style="list-style-type: none"> <li>✓ Provides a channel for delivering clear messages and encouraging open communication.</li> <li>✓ Regular face-to-face communication prevents rumor from gaining credibility.</li> <li>✓ Enables questions and suggestions to be fed back from staff to the top.</li> <li>✓ Develops greater awareness and involvement at all levels.</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Develops a shared sense of mission, collective aims and reasons why we're here.</li> <li>✓ Explains financial, commercial and strategic issues.</li> <li>✓ Ensures that staffs are kept up to date on performance, progress and policy changes.</li> <li>✓ Enables discussion of sensitive matter because it's face-to-face.</li> </ul>
14	List the three steps to carrying out a team briefing.	<ol style="list-style-type: none"> <li>1. Arranging your team briefing</li> <li>2. Preparing the agenda</li> <li>3. Presenting the briefing</li> </ol>
15	Explain how to arrange a team briefing.	<ul style="list-style-type: none"> <li>✓ Timing: try setting dates for at least six months at a time so that your staff are well aware of the dates in advance and can put them into their diaries. Briefings should be held at least once a month.</li> <li>✓ Size: the ideal team is made up of around 4-15 people.</li> <li>✓ Venue: make sure you choose a suitable venue for your team briefing.</li> <li>✓ Publicizing the briefing: once you've got all the arrangements in place, make sure that you give your team enough time so that they are able to attend.</li> </ul>
16	Explain how to prepare a agenda.	<ul style="list-style-type: none"> <li>✓ Priorities: sort the items into Must know information (details essential to the team and its day to day activities), Should know information (details which staff should know about as a matter) and Nice to know information (information useful to know).</li> <li>✓ Timing: work about how long each item should take and remember to allow time for questions after each item.</li> </ul>
17	Explain how to present the briefing.	<ul style="list-style-type: none"> <li>✓ Core brief: it's the written briefing details from the CEO or board which will be passed on to every employee at every Team Briefing meeting.</li> <li>✓ Local brief: it's a separate written brief prepared by each team leader, manager or supervisor, for his or her own team, containing local issues relevant to that team.</li> <li>✓ Feedback form: it's a separate document which enables the questions arising at briefings to be recorded, answered, whether at the time or later, and that process to be monitored.</li> </ul>
18	List a few points that should be taken into consideration during a briefing.	<ul style="list-style-type: none"> <li>✓ Concentrate and listen so that you hear the questions asked by other people.</li> <li>✓ Make concise notes.</li> <li>✓ Ask questions to clarify the information you have been given.</li> <li>✓ Delivering a team brief to your own team make sure you understand which points are of particular relevance to your area of work.</li> </ul>

19	Identify four of the facilitator's roles.	<ul style="list-style-type: none"> <li>✓ Frequency</li> <li>✓ Duration</li> <li>✓ Feedback</li> <li>✓ Monitoring the team briefing</li> </ul>
20	Explain frequency as a role of a facilitator.	Team briefing meetings need to be held on a planned and regular basis.
21	Explain duration as a role of a facilitator.	Your briefing should last around 30 minutes. If there isn't much information to impart then just reduce the length of the team briefing. Make sure you leave enough time for staff to ask questions - this is a two-way form of communication.
22	Explain feedback as a role of a facilitator.	With any luck your team will give you some useful feedback and make some valid suggestions during your team briefing. It's really important that you do something constructive with this feedback - the team could be unsatisfied if they feel their views are not being taken seriously.
23	Explain monitoring the team briefing as a role of a facilitator.	Managers at a senior level should make every effort to "sit in" on team briefings within their area of work to assess how successful team briefing is. The Internal Communications team will also carry out periodic research into the distribution and effectiveness of team briefing.
24	Identify the steps taken when installing the new sewage pump.	<ul style="list-style-type: none"> <li>✓ Clean debris out of the basin</li> <li>✓ Position the basin</li> <li>✓ Install the new check valve</li> <li>✓ Set up the float switch</li> <li>✓ Test the pump and float switch</li> <li>✓ Measure and cut the PVC pipe</li> <li>✓ Drill a weep hole</li> <li>✓ Connect the adapter and pump to the discharge pipe</li> <li>✓ Lower sewage pump into the pit</li> <li>✓ Connect the discharge pipe to the check valve</li> <li>✓ Test the sewage system</li> <li>✓ Confirm proper placement of all components</li> <li>✓ Secure the sewage basin cover</li> <li>✓ Connect the vent pipe to the top of the basin cover</li> </ul>
25	List five things you can do when creating a plan.	<ul style="list-style-type: none"> <li>✓ Select a project leader – one who will have the time and temperament to command resources in an effective manner</li> <li>✓ Define the absolute requirements for acceptable operation – what work must the equipment do?</li> <li>✓ Identify and address anticipated failure modes for the overall system and all subsystems.</li> <li>✓ Verify operating conditions (as specified by the equipment seller) will be met – i.e., operating environmental conditions (temperature, humidity, pressures, voltage, etc.).</li> <li>✓ Define the testing steps necessary and the order of those steps in the commissioning process. These steps are derived from experience, knowledge and research.</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Define the skills sets necessary – mechanical, electrical, controls and engineering</li> <li>✓ Schedule the resources and personnel to accomplish the defined steps</li> <li>✓ Record the observations and test point values measured (perceived) during each step.</li> </ul>
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## 2.PT=Practical Test

#	Activity to be performed	Activity to be evaluated and assessed
1	Student Assignments	Students need to undertake assignments related to installing and commissioning repair pumps, 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"> <li>✓ Identify scope of machine installation, commissioning or modification task</li> <li>✓ Brief team on requirements</li> <li>✓ Commence installation, commissioning or modification task</li> <li>✓ Monitor progress and deal with contingencies</li> <li>✓ Finalize installation, commissioning or modification</li> <li>✓ Conduct handover and finalize documentation</li> </ul>
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"> <li>✓ Identify scope of machine installation, commissioning or modification task</li> <li>✓ Brief team on requirements</li> <li>✓ Commence installation, commissioning or modification task</li> <li>✓ Monitor progress and deal with contingencies</li> <li>✓ Finalize installation, commissioning or modification</li> <li>✓ Conduct handover and finalize documentation</li> </ul>
4	Carry out the three processes of project scoping	<p>The student is expected to follow the correct step-by step procedures on the three processes of project scoping. The elements which should be assessed are:</p> <ul style="list-style-type: none"> <li>✓ Planning</li> <li>✓ Controlling</li> <li>✓ Closing</li> </ul>

## 1. OW = Observation at work Place

#	Activity to be observed	Evaluative Assessment of the observed activity
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"> <li>✓ Identify scope of machine installation, commissioning or modification task</li> <li>✓ Brief team on requirements</li> <li>✓ Commence installation, commissioning or modification task</li> <li>✓ Monitor progress and deal with contingencies</li> <li>✓ Finalize installation, commissioning or modification</li> <li>✓ Conduct handover and finalize documentation</li> </ul>
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 installing and commissioning of centrifugal and positive displacement pumping systems for outdoor power equipment.</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 brief team on requirements	As the students attend the practical test to assess their skill in conducting team briefing, make sure the student use the proper techniques and the information he shared is accurate.

## 2. OQ=Oral Questioning

#	Questions	Answers
1	Identify scope of machine installation, commissioning or modification task	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Examine machine and equipment drawings, manufacturer's manuals and other technical data on machines and equipment</li> <li>✓ Determine performance and production requirements expected from machines and equipment after installation, commissioning or modification</li> <li>✓ Determine relevant regulatory requirements</li> <li>✓ Inspect site and determine appropriateness of structural supports, ventilation, services, security and other critical requirements</li> <li>✓ Determine mechanical, electrical, fabrication and machine control skills and task requirements</li> </ul>



		<ul style="list-style-type: none"> <li>✓ Produce or review installation, commissioning or modification schedule</li> </ul>
2	Brief team on requirements	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Distribute and discuss drawings, schedules, and major materials and equipment with team</li> <li>✓ Arrange for request for further information (RFIs) with designers, where required</li> <li>✓ Brief team on key compliance and risk factors, including regulatory, occupational health and safety (OHS) and environmental requirements</li> <li>✓ Agree with team on critical control points and reporting requirements</li> </ul>
3	Commence installation, commissioning or modification task	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Supervise machine and equipment shutdowns required for task</li> <li>✓ Supervise unloading of any new machines, equipment and materials required for task</li> <li>✓ Check and determine that supply of services to work are adequate for task commencement</li> <li>✓ Ensure all tradespersons have correct drawing</li> </ul>
4	Monitor progress and deal with contingencies	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Establish procedures to ensure assembly and connections are against drawing specifications</li> <li>✓ Ensure electrical, fluid power, and control systems and circuits are consistent with specifications and regulations</li> <li>✓ Identify problems and contingencies and establish and rectify root cause</li> </ul>
5	Finalize installation, commissioning or modification	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Conduct final check to ensure installation, commissioning or modification is consistent with drawings, manufacturer manuals and any regulatory requirements</li> <li>✓ Conduct test run of equipment</li> <li>✓ Identify and correct any malfunctions or errors in required output</li> </ul>
6	Conduct handover and finalize documentation	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Brief client and operators on machine or equipment operation after installation</li> <li>✓ Prepare and submit any required reports on installation, commissioning or modification</li> </ul>

### 3. 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-10: Locate and clear blockages

Unit No 10  
 Unit Title Locate and clear blockages  
 Unit Code CONS05CR06V1/21

### 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 *
<b>1. Prepare for work</b>							
Plans and specifications are obtained from job supervisor	✓	✓	✓	✓	✓	✓	✓
Work health and safety and environmental requirements associated with locating and clearing blockages are adhered to throughout the work	✓		✓	✓	✓		✓
Quality assurance requirements are identified and adhered to according to 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	✓	✓	✓	✓	✓	✓	✓
Plans and specifications are obtained from job supervisor		✓	✓	✓		✓	✓
<b>2. Locate and clear blockage</b>							
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		✓	✓	✓		✓	✓
<b>3. Clean up</b>							
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	Identify three ways in which employers and workers can identify and assess hazards.	<ul style="list-style-type: none"> <li>✓ Collect and review information about the hazards present or likely to be present in the workplace.</li> <li>✓ Conduct initial and periodic workplace inspections of the workplace to identify new or recurring hazards.</li> <li>✓ Investigate injuries, illnesses, incidents, and close calls/near misses to determine the underlying hazards, their causes, and safety and health program shortcomings.</li> <li>✓ Group similar incidents and identify trends in injuries, illnesses, and hazards reported.</li> <li>✓ Consider hazards associated with emergency or nonroutine situations.</li> <li>✓ Determine the severity and likelihood of incidents that could result for each hazard identified, and use this information to prioritize corrective actions.</li> </ul>
2	Identify the six steps that can be taken to identify and assess hazards in the workplace.	<ol style="list-style-type: none"> <li>1. Collect existing information about workplace hazards</li> <li>2. Inspect the workplace for safety hazards</li> <li>3. Identify health hazards</li> <li>4. Conduct incident investigations</li> <li>5. Identify hazards associated with emergency and non-routine situations</li> <li>6. Characterize the nature of identified hazards, identify interim control measures, and prioritize the hazards for control</li> </ol>
3	Explain in detail how you can collect existing information about workplace hazards.	<ul style="list-style-type: none"> <li>✓ Equipment and machinery operating manuals.</li> <li>✓ Safety Data Sheets (SDS) provided by chemical manufacturers.</li> <li>✓ Self-inspection reports and inspection reports from insurance carriers, government agencies, and consultants.</li> <li>✓ Records of previous injuries and illnesses, such as OSHA 300 and 301 logs and reports of incident investigations.</li> <li>✓ Workers' compensation records and reports.</li> <li>✓ Patterns of frequently-occurring injuries and illnesses.</li> <li>✓ Exposure monitoring results, industrial hygiene assessments, and medical records (appropriately redacted to ensure patient/worker privacy).</li> <li>✓ Existing safety and health programs (lockout/tagout, confined spaces, process safety management, personal protective equipment, etc.).</li> <li>✓ Input from workers, including surveys or minutes from safety and health committee meetings.</li> <li>✓ Results of job hazard analyses, also known as job safety analyses.</li> </ul>
4	Explain in detail how you can inspect the	<ul style="list-style-type: none"> <li>✓ Conduct regular inspections of all operations, equipment, work areas and facilities. Have workers participate on the</li> </ul>

	workplace for safety hazards.	<p>inspection team and talk to them about hazards that they see or report.</p> <ul style="list-style-type: none"> <li>✓ Be sure to document inspections so you can later verify that hazardous conditions are corrected. Take photos or video of problem areas to facilitate later discussion and brainstorming about how to control them, and for use as learning aids.</li> <li>✓ Include all areas and activities in these inspections, such as storage and warehousing, facility and equipment maintenance, purchasing and office functions, and the activities of on-site contractors, subcontractors, and temporary employees.</li> <li>✓ Regularly inspect both plant vehicles (e.g., forklifts, powered industrial trucks) and transportation vehicles (e.g., cars, trucks).</li> <li>✓ Use checklists that highlight things to look for. Typical hazards fall into several major categories, such as those listed below; each workplace will have its own list: <ul style="list-style-type: none"> <li>○ General housekeeping</li> <li>○ Slip, trip, and fall hazards</li> <li>○ Electrical hazards</li> <li>○ Equipment operation</li> <li>○ Equipment maintenance</li> <li>○ Fire protection</li> <li>○ Work organization and process flow (including staffing and scheduling)</li> <li>○ Work practices</li> <li>○ Workplace violence</li> <li>○ Ergonomic problems</li> <li>○ Lack of emergency procedures</li> </ul> </li> <li>✓ Before changing operations, workstations, or workflow; making major organizational changes; or introducing new equipment, materials, or processes, seek the input of workers and evaluate the planned changes for potential hazards and related risks</li> </ul>
5	Explain in detail how you can identify health hazards.	<ul style="list-style-type: none"> <li>✓ Identify chemical hazards –review SDS and product labels to identify chemicals in your workplace that have low exposure limits, are highly volatile, or are used in large quantities or in unventilated spaces. Identify activities that may result in skin exposure to chemicals.</li> <li>✓ Identify physical hazards –identify any exposures to excessive noise (areas where you must raise your voice to be heard by others), elevated heat (indoor and outdoor), or sources of radiation (radioactive materials, X-rays, or radiofrequency radiation).</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Identify biological hazards –determine whether workers may be exposed to sources of infectious diseases, molds, toxic or poisonous plants, or animal materials (fur or scat) capable of causing allergic reactions or occupational asthma.</li> <li>✓ Identify ergonomic risk factors –examine work activities that require heavy lifting, work above shoulder height, repetitive motions, or tasks with significant vibration.</li> <li>✓ Conduct quantitative exposure assessments –when possible, using air sampling or direct reading instruments.</li> <li>✓ Review medical records –to identify cases of musculoskeletal injuries, skin irritation or dermatitis, hearing loss, or lung disease that may be related to workplace exposures.</li> </ul>
6	<p>Explain in detail how you can conduct incident investigations.</p>	<ul style="list-style-type: none"> <li>✓ Develop a clear plan and procedure for conducting incident investigations, so that an investigation can begin immediately when an incident occurs. The plan should cover items such as: <ul style="list-style-type: none"> <li>○ Who will be involved</li> <li>○ Lines of communication</li> <li>○ Materials, equipment, and supplies needed</li> <li>○ Reporting forms and templates</li> </ul> </li> <li>✓ Train investigative teams on incident investigation techniques, emphasizing objectivity and open-mindedness throughout the investigation process.</li> <li>✓ Conduct investigations with a trained team that includes representatives of both management and workers.</li> <li>✓ Investigate close calls/near misses.</li> <li>✓ Identify and analyze root causes to address underlying program shortcomings that allowed the incidents to happen.</li> <li>✓ Communicate the results of the investigation to managers, supervisors, and workers to prevent recurrence.</li> </ul>
7	<p>Explain in detail how you can identify hazards associated with emergency and non-routine situations.</p>	<ul style="list-style-type: none"> <li>✓ Identify foreseeable emergency scenarios and non-routine tasks, taking into account the types of material and equipment in use and the location within the facility. Scenarios such as the following may be foreseeable: <ul style="list-style-type: none"> <li>○ Fires and explosions</li> <li>○ Chemical releases</li> <li>○ Hazardous material spills</li> <li>○ Startups after planned or unplanned equipment shutdowns</li> <li>○ Non-routine tasks, such as infrequently performed maintenance activities</li> <li>○ Structural collapse</li> <li>○ Disease outbreaks</li> <li>○ Weather emergencies and natural disasters</li> <li>○ Medical emergencies</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>○ Workplace violence</li> </ul>
8	Explain in detail how you can characterize the nature of identified hazards, identify interim control measures, and prioritize the hazards for control.	<ul style="list-style-type: none"> <li>✓ Evaluate each hazard by considering the severity of potential outcomes, the likelihood that an event or exposure will occur, and the number of workers who might be exposed.</li> <li>✓ Use interim control measures to protect workers until more permanent solutions can be implemented.</li> <li>✓ Prioritize the hazards so that those presenting the greatest risk are addressed first. Note, however, that employers have an ongoing obligation to control all serious recognized hazards and to protect workers.</li> </ul>
9	What equipment is used to remove most blockages from sewer pipes?	Plumbing rods.
10	Why is it important to remember which way the rods and endings have been screwed together and twist the rods in the same direction?	If this is not done, the rods are likely to become unscrewed and be left in the sewer pipe. This will create a worse problem because the rods will also block the pipe. If this happens it will probably be necessary to dig up the sewer pipe and break it to unblock the pipe and get the rods back. This would have to be done by a licensed plumber.
11	What are the boxes that cover sewer pipes made of?	Concrete.
12	What are the lids of the boxes made of?	Metal.
13	Why are the lids of the boxes made to be lifted?	To allow someone to look down into the sewer to see if there is evidence of a blockage.
14	Identify four things that should be taken into consideration before attempting to unblock a sewer pipe.	<ul style="list-style-type: none"> <li>✓ Before making an inspection, always wait several minutes to allow any poisonous or explosive gases to escape</li> <li>✓ Never smoke while doing this work</li> <li>✓ Never do this work alone</li> <li>✓ Never enter a manhole without proper safety measures. It may be necessary to wear breathing equipment or to ventilate (add fresh air) to the manhole and sewer pipe. The gases in it can kill.</li> </ul>
15	What can contact with wastewater result in?	Disease.
16	Briefly describe how to unblock a sink.	To unblock a sink, shower recess or any tubs, first remove any larger pieces of rubbish and then try using a plunger or a mop to finish unblocking the pipe.
17	What is best to use when unblocking a toilet pan?	Mop.
18	What is a septic tank used for?	A septic tank can be used to treat the sewage from individual buildings at the building itself or for the whole community, at the lagoon.



19	What is a septic tank?	The septic tank is a sealed round or rectangular container which is used to break down the sewage so that it becomes effluent through the action of bacteria living on the waste matter.
20	What does a septic tank consist of?	A household septic tank usually consists of two round concrete tanks with lids placed close to each other. They are connected by a pipe. This type of septic tank is designed to be used by up to 10 people. Round tanks are constructed (built) at a factory and transported to the site (place) where they are to be used.
21	Explain in detail how a septic tank works.	<p>A septic tank must be filled with water before it is used. The water helps start the treatment of the sewage by the bacteria. The sewage treatment by the bacteria turns the waste matter into effluent (wastewater) and a solid substance called sludge. The effluent gets carried to the leach drain, French drain or lagoon.</p> <p>The material in the septic tank gets covered by a hard crust known as a scum blanket. This blanket acts as an air seal keeping air away from the sewage. The lack of air helps in the breakdown of the sewage by the bacteria.</p> <p>The sludge gathers at the bottom of the tanks. Eventually there will be too much sludge in the tank and it must be pumped out and the sludge disposed of correctly.</p> <p>By having two tanks or a rectangular tank divided into two sections, most of the sludge stays in the first tank or section. In the second tank or section, the sewage undergoes further treatment to remove solid matter.</p> <p>The effluent is then piped to the effluent disposal system, such as the lagoon. This water still contains germs and parasites</p>
22	Identify three signs that a septic tank isn't working properly.	<ul style="list-style-type: none"> <li>✓ The sewage in the toilet or the liquid waste from other fixtures flows away very slowly</li> <li>✓ Liquid waste overflows from the disconnecter trap</li> <li>✓ Wet areas are seen at the top of the septic tank</li> <li>✓ There is a strong unpleasant smell near the septic tank</li> <li>✓ The grass around the tank is very green and growing well</li> </ul>
23	What are the parts that should be checked if there are signs of problems with a septic tank?	<ul style="list-style-type: none"> <li>✓ the scum blanket (as it may become too thick and block the inlet pipe)</li> <li>✓ the inlet or outlet pipes (as they may be blocked by solid matter)</li> <li>✓ the sludge (as it may have accumulated so that it fills most of the tank)</li> <li>✓ the tank's bottom, sides or lids (as one or more of these may have been cracked or broken. For example, vehicle movements over septic tanks are likely to damage the lids and sides.)</li> </ul>

24	Explain the procedure before commencing pump out.	<ul style="list-style-type: none"> <li>✓ Find out if the community has or can obtain a pump-out tank or tanker. Make sure the sludge pump (pump-out equipment) is available and working.</li> <li>✓ Locate an appropriate disposal site.</li> <li>✓ If a tank or tanker is used, the disposal site must be a place which is suitable for getting rid of the dangerous sludge and effluent and be able to take all the pumped out materials. For example, the site must be well away from water supplies, children's play areas, camp places, rivers and streams, and downwind if possible. Often this place will be a hole dug in a separate part of the community rubbish tip.</li> <li>✓ If there is no tank or tanker available, the pumped-out material must be disposed of in a hole near the septic tank.</li> <li>✓ The distance between the septic tanks and the disposal hole will depend upon the length of the pump-out hose. The hole must be away from water supplies.</li> <li>✓ Where possible, remove any tins, bottles, rags, newspaper and other rubbish that may be in the septic tank. This material can either be disposed of in the pump-out hole at the site or at the rubbish tip.</li> <li>✓ All sewage material which is to be taken to the tip should be transported in sealed drums.</li> </ul>
25	Explain the procedure of pumping out the septic tank.	<ul style="list-style-type: none"> <li>✓ Pump out the sludge into the tanker or the hole.</li> <li>✓ If using a tanker the sludge can be deposited at the appropriate site away from the community.</li> <li>✓ If the disposal site is near the septic tank and the pump-out has commenced, the hole must be guarded at all times even if the pump-out stops for some reason, for example, for a lunch break or because of an equipment breakdown. The sewage must be covered with soil if the pump-out is not finished by the end of the day.</li> <li>✓ After covering the sludge with this layer of soil there may still be space in the hole to complete the pump-out the next day.</li> <li>✓ When covering the sludge with soil, remember that some time must allowed for the liquid to soak away before putting soil in the hole.</li> <li>✓ When the job is finished the hole should be filled with a thick layer of soil.</li> <li>✓ Once the septic tank has been completely emptied, it must be filled with water before it is used again.</li> </ul>

## 2. PT=Practical Test

#	Practical Activity	Additional Details
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	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"> <li>✓ Prepare for work</li> <li>✓ Locate and clear blockage</li> <li>✓ Clean up</li> </ul>
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"> <li>✓ Prepare for work</li> <li>✓ Locate and clear blockage</li> <li>✓ Clean up</li> </ul>
4	Demonstrate how to properly inspect the workplace for safety hazards	The student is expected to follow the correct step-by step process to measuring dry ingredients. The elements which should be assessed are: <ul style="list-style-type: none"> <li>✓ Conduct regular inspections of all operations, equipment, work areas and facilities. Have workers participate on the inspection team and talk to them about hazards that they see or report.</li> <li>✓ Be sure to document inspections so you can later verify that hazardous conditions are corrected. Take photos or video of problem areas to facilitate later discussion and brainstorming about how to control them, and for use as learning aids.</li> <li>✓ Include all areas and activities in these inspections, such as storage and warehousing, facility and equipment maintenance, purchasing and office functions, and the activities of on-site contractors, subcontractors, and temporary employees.</li> <li>✓ Regularly inspect both plant vehicles (e.g., forklifts, powered industrial trucks) and transportation vehicles (e.g., cars, trucks).</li> </ul>

## 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"> <li>✓ Prepare for work</li> <li>✓ Locate and clear blockage</li> <li>✓ Clean up</li> </ul>
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 locating and clearing blockages to sanitary plumbing and drainage with the use of mechanically operated drain clearing machines and attachments, closed circuit television (CCTV) and manually operated drain cleaning tools and equipment where required.</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 and safely unblock fixtures	As the students attend the practical test to assess their skill in unblocking fixtures, 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	Prepare for work	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Plans and specifications are obtained from job supervisor.</li> <li>✓ Work health and safety and environmental requirements associated with locating and clearing blockages are adhered to throughout the work.</li> <li>✓ Quality assurance requirements are identified and adhered to according to workplace requirements</li> <li>✓ Tasks are planned and sequenced in conjunction with others involved in or affected by the work</li> <li>✓ Tools and equipment, including personal protective equipment, are selected and checked for serviceability.</li> <li>✓ Work area is prepared to support efficient locating and clearing of blockage</li> <li>✓ Plans and specifications are obtained from job supervisor.</li> </ul>
2	Locate and clear blockage	Make sure the students answer questions related to the following areas

		<ul style="list-style-type: none"> <li>✓ Section containing blockage is located and isolated and its material identified.</li> <li>✓ Blockage clearing equipment is selected according to the job.</li> <li>✓ Where necessary, mechanical drain clearing equipment is assembled and used according to manufacturer instructions.</li> <li>✓ Blockage is cleared without causing damage to pipework and fittings.</li> <li>✓ Pipework is tested to confirm blockage is cleared from pipe system.</li> <li>✓ Where required, authorities are advised of work completion.</li> <li>✓ Sustainability principles and concepts are applied throughout the locating and clearing process.</li> </ul>
3	Clean up	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Work area is cleared and materials disposed of, reused or recycled according to legislation, regulation, codes of practice and job specification.</li> <li>✓ Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures.</li> <li>✓ Information is accessed and documentation completed according to workplace requirements.</li> </ul>

### 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=

		<p>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-11: Install below ground Industrial sewerage systems

Unit No	11
Unit Title	Install below ground Industrial sewerage systems
Unit Code	CONS05CR07V1/21

### 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*
<b>1. Prepare for drainage system installation activities</b>							
The construction site for the drainage system and construction method is identified according to the site and drainage system plans and enterprise work procedures	✓	✓	✓	✓	✓	✓	✓
Materials, tools, equipment and machinery are selected according to drainage system design requirements and enterprise work procedures	✓		✓	✓	✓		✓
Pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturer's specifications and enterprise work procedures	✓	✓	✓	✓	✓	✓	✓
OHS hazards are identified, risks assessed, controls implemented and reported to the supervisor	✓	✓	✓		✓	✓	✓
Suitable safety and personal protective equipment (PPE) are selected, used and maintained		✓	✓	✓		✓	✓
<b>2. Co-ordinate installation work</b>							
Enterprise work team, contractors and design consultants are identified and work tasks are coordinated in a sequential, timely and effective manner in consultation with the supervisor	✓	✓	✓	✓	✓	✓	✓
Installation of the drainage system is undertaken according to OHS requirements and with due consideration of the environmental implications and relevant legislation and regulations	✓		✓	✓	✓		✓
A clean and safe work area is maintained throughout and on completion of work	✓	✓	✓	✓	✓	✓	✓
<b>3. Prepare the site for installation of drainage system</b>							
Symbols and terminology are interpreted to ensure the concept of the drainage system plan is clearly understood according to industry practice	✓	✓	✓	✓	✓	✓	✓

Layout of services is identified, depths checked against the site or drainage system plan and discrepancies are reported to the supervisor and the relevant authority	✓		✓	✓	✓		✓
Survey, measurement and marking out of the site and confirmation of soil characteristics relevant to the planned drainage system are completed according to plan specifications and enterprise work procedures	✓	✓	✓	✓	✓	✓	✓
<b>4. Undertake installation of drainage system</b>							
Excavations are completed without damage to services, facilities, features and established plants according to plan specifications and enterprise work procedures	✓	✓	✓	✓	✓	✓	✓
The drainage system is installed according to the drainage system plan and enterprise work procedures	✓		✓	✓	✓		✓
The drainage system is tested for configuration, flow rates and capacity consistent with the drainage system plan and according to enterprise work procedures	✓	✓	✓	✓	✓	✓	✓
The supervisor is consulted and remedial action is taken when the drainage system operation does not meet the plan specifications	✓	✓	✓		✓	✓	✓
<b>5. Complete installation of drainage system</b>							
Earthworks are finished off to the plan specifications and enterprise work procedures	✓	✓	✓	✓	✓	✓	✓
The site is restored and waste material is removed from the site and disposed of in an environmentally aware and safe manner according to enterprise work procedures	✓		✓	✓	✓		✓
Tools, equipment and machinery are cleaned, maintained and stored according to enterprise work procedures	✓	✓	✓	✓	✓	✓	✓
Work outcomes are recorded or reported to the supervisor according to enterprise work procedures	✓	✓	✓		✓	✓	✓

**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 kind of material is best for drainage flows?	Corrugated plastic.
2	Identify the five steps to successful team coordination.	<ul style="list-style-type: none"> <li>✓ Know the big picture</li> <li>✓ Create well-defined roles</li> <li>✓ Foster great communication</li> <li>✓ Master your planning</li> <li>✓ Don't overdo it</li> </ul>



3	Explain why knowing the big picture is important.	Good planning is all in the details, but before you can get there, you'll need a strong vision of your team's overall goal. Without a clear, concise, and concrete goal, your team will be floundering from the first minute. As circumstances change and unforeseen obstacles arise, a team leader must keep the big picture in mind at all times and make changes accordingly.
4	Explain why creating well-defined roles is important.	Teams work best when everyone has a role that plays to their strength. The last thing you want is team members competing with each other over resources or tasks. That's why it's critical to know the strengths and weaknesses of your team members, and assign them where they'll be able to work best. Some people like to joke about <a href="#">org charts</a> , but they can be a lifesaver when it comes to team coordination.
5	Explain why fostering great communication is important.	Good communication is at the heart of any successful project, business or otherwise. This doesn't just mean meetings – too many meetings can drag down productivity and erode morale. Good communication should run through everything you do, whether it's via email, text, communication software, or in-person interactions. Transparency, clarity, empathy and respect are all critical. A good team leader must have great communication skills to keep their team motivated and coordinated... and the right tools don't hurt, either.
6	Explain why not overdoing it is important.	Believe it or not, there can be such a thing as too much coordination. Even the well-designed team may have disagreements about how to manage their resources and time... in fact, it's pretty likely. Don't fall into the trap of assuming everyone has to work like a well-oiled machine all the time. Too much coordination can cost you productivity in terms of pointless meetings, long presentations, disagreements between colleagues, and poor results. Know when to loosen the reins and let people work.
7	Identify three things you can do when checking the site before installation.	<ul style="list-style-type: none"> <li>✓ Make sure the foundation concrete is of sufficient strength.</li> <li>✓ Only place the pump set on a foundation whose concrete has set firmly.</li> <li>✓ Only place the pump set on a horizontal and level surface.</li> <li>✓ Refer to the weights given in the Pump general arrangement (GA) drawing.</li> <li>✓ All structural work required must have been prepared in accordance with the dimensions stated in the outline drawing/general arrangement drawing.</li> </ul>
8	Identify two things you can do to prevent potentially explosive atmospheres.	<ul style="list-style-type: none"> <li>✓ Comply with the applicable local explosion protection regulations.</li> </ul>

		✓ Observe the information in the datasheet and on the nameplates of the pump and motor.
9	Explain why understanding legislation matters.	The installation of an off mains drainage system can be a daunting prospect when you start looking into all the legal aspects. There are rules and regulations for everything from the type of tank that is appropriate for a property, to where it can be installed, where it can discharge to, and what kind of ground conditions are acceptable.
10	What should you do if a drainage field is your only discharge option?	You may also be able to look at installing a septic tank as a more cost effective alternative to a sewage treatment plant.
11	Why is it important to first evaluate the area of installation before buying and installing your sewage treatment plant?	Unfortunately, when it comes to sewage treatment, it's not always a case of just picking a product "off the shelf" and having it installed. There are many factors that will affect the suitability of any tank to your property including the type of wastewater to be treated, the effluent output quality needed, the proximity of the intended install point to any buildings, the location of the discharge point, the porosity of the ground if a drainage field is needed and the availability of site access for maintenance.
12	Briefly describe what you must do before planning your system.	<ul style="list-style-type: none"> <li>✓ Conduct a Groundwater Source Protection Zone Search</li> <li>✓ Conduct Trial Site Assessment Hole Test (if you need to install a drainage field)</li> <li>✓ Conduct Percolation Tests (if you need to install a drainage field)</li> <li>✓ Check that a tank, and a drainage field (if using one), can be situated far enough from habitable dwellings, as per the General Binding Rules.</li> </ul>
13	Identify three regulations when fitting the sewage treatment plant on your property.	<ul style="list-style-type: none"> <li>✓ At least 3 meters away from any boundary line of the property</li> <li>✓ At least 3 meters away from any significant root systems (i.e. from trees and bushes)</li> <li>✓ At least 10 meters away from any habitable building</li> <li>✓ No greater than 30 meters away from a hard standing area suitable for desludging tanker access.</li> </ul>
14	Identify three things to consider when finding the right sewage treatment plant.	<ul style="list-style-type: none"> <li>✓ Sizing the tank to your needs</li> <li>✓ Choosing the right tank</li> <li>✓ Sizing the drainage field</li> </ul>
15	What factors should you take into consideration when choosing the right domestic sewage treatment plant?	Unfortunately, there is no straightforward, easy answer to this question. The best sewage treatment plant for you will depend on a multitude of factors, ranging from those born by restrictions (such as how deep you can install a tank and your discharge options) to those of a more personal choice (such as a desire for

		low running costs or minimum aesthetic disruption to your garden).
16	When is a gravity system the preferable option?	However, if the tank is to be installed in a location where there is no natural fall of gravity from the outlet pipe, the aid of a pump may be needed to achieve the required discharge level.
17	What are septic drainage fields?	Septic drainage fields (sometimes referred to as septic drain fields, leach fields or foul water soakaways) are subsurface wastewater treatment facilities which are used to remove contaminants and impurities from the effluent that emerges from a septic tank or sewage treatment plant.
18	What does a septic drainage field consist of?	They usually consist of an arrangement of trenches, which contain perforated pipes and gravel, sited beneath a soft landscaped area such as a lawn.
19	When needing a drainage field, what does the size of the plant depend on?	If you need a drainage field for your sewage treatment plant (presumably because you can't discharge to a watercourse), determining the size required for your system will depend on both the size of your property/number occupants and the results of your percolation tests.
20	Identify the stages of installing a sewage treatment plant.	<ul style="list-style-type: none"> <li>✓ Inspect tank for damage</li> <li>✓ Check you have correct invert depths</li> <li>✓ Siting the tank</li> <li>✓ Consider drainage falls</li> <li>✓ Place the tank</li> <li>✓ Use correct backfill</li> <li>✓ Install the inlet and outlet</li> <li>✓ Wire up the electrical connection</li> <li>✓ Fit correct cover and frame</li> <li>✓ Consider ventilation arrangements</li> </ul>
21	Explain how to consider ventilation arrangements.	This can often be overlooked, but it is important to ensure your system is well vented to prevent odor issues on site. Ideally, there should be a vent on the treatment plant and, if you have a drainage field, venting at the ends of the percolation trenches too.
22	Identify three things you should not do when installing a sewage treatment plant.	<ul style="list-style-type: none"> <li>✓ Subject the tank to impact or contact with sharp edges</li> <li>✓ Add neck extensions to the tank, nor build a brick manhole above the tank neck (as this increases burial depth of the tank) as it is not recommend extending the neck of the tank under any circumstances</li> <li>✓ Install the tank deeper than the depth that the fitted neck will allow</li> <li>✓ Install in trafficked areas without a suitable backfill design</li> <li>✓ Site the tank so that it is subjected to excess ground pressure (e.g. sloping ground) or applied loads such as may be generated by vehicular traffic</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Fill an unsupported tank</li> <li>✓ Backfill an empty tank</li> </ul>
23	What is biomass?	Live natural micro-organisms (also known as biomass) to break down the pollutants in the sewage that you flush, wash and drain away.
24	Explain why waste disposal units can affect biomass.	Using a waste disposal unit won't cause damage to the biomass, but it can put a considerable extra load on the sewage treatment plant, both in terms of organic load and liquid, as the ground up material is flushed into the unit. If you intend to use one of these with your sewage treatment plant system, please speak to the manufacturer of your chosen tank to find out if their product will be able to deal with the extra loads.
25	Identify five things that shouldn't be discharged into drains if you have a sewage treatment plant.	<ul style="list-style-type: none"> <li>✓ Motor oil, grease, anti-freeze, brake fluid etc.</li> <li>✓ Cooking oil and fat</li> <li>✓ Weed-killers, insecticides, fungicides and other gardening chemicals</li> <li>✓ Paint, thinners, white spirit, turpentine, creosote etc.</li> <li>✓ Chemical drain cleaners/commercial cleaning products</li> <li>✓ Acid based brick/stone floor cleaners</li> <li>✓ Medicines (return unused medicines to a pharmacist for safe disposal)</li> <li>✓ Photographic developing fluids</li> <li>✓ Nappies, sanitary towels, toilet wipes etc. (even biodegradable ones as they do not fully degrade in a treatment plant and can lead to blockages and malfunctions)</li> </ul>

## 2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to installing below ground industrial sewerage 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"> <li>✓ Prepare for drainage system installation activities</li> <li>✓ Co-ordinate installation work</li> <li>✓ Prepare the site for installation of drainage system</li> <li>✓ Undertake installation of drainage system</li> <li>✓ Complete installation of drainage system</li> </ul>

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"> <li>✓ Prepare for drainage system installation activities</li> <li>✓ Co-ordinate installation work</li> <li>✓ Prepare the site for installation of drainage system</li> <li>✓ Undertake installation of drainage system</li> <li>✓ Complete installation of drainage system</li> </ul>
4	Demonstrate how to properly install the pump assembly	<p>The student is expected to follow the correct step-by step process to installing a pump assembly. The elements which should be assessed are:</p> <ul style="list-style-type: none"> <li>✓ Position the pump on the foundation and use a spirit level to align the shaft and discharge nozzle. Permissible deviation: 0.2 mm/m.</li> <li>✓ If required, use shims (2) to adjust the height. Fit shims between the baseplate/foundation frame and the foundation itself; always insert them to the left and right of the foundation bolts and in close proximity to these bolts.</li> <li>✓ For a bolt-to-bolt clearance &gt; 800 mm, insert additional shims halfway between the adjoining holes. All shims must lie perfectly flush.</li> <li>✓ Insert the foundation bolts (4) into the holes provided.</li> <li>✓ Use concrete to set the foundation bolts (4) into the foundation.</li> <li>✓ Wait until the concrete has set firmly and then align the baseplate.</li> <li>✓ Tighten the foundation bolts (4) evenly and firmly.</li> <li>✓ Grout the baseplate using low-shrinkage concrete with standard particle size and a water/concrete ratio of <math>\leq 0.5</math>.</li> <li>✓ Produce flow-ability with the help of a solvent.</li> <li>✓ For low-noise operation, the pump set can be mounted on vibration dampers upon confirmation by the manufacturer. In this case, only fasten the flexible elements at the baseplate after the piping has been connected.</li> <li>✓ Expansion joints can be fitted between the pump and the suction/discharge line.</li> <li>✓ Observe the permissible forces and moments at the pump nozzles.</li> <li>✓ Take appropriate measures to compensate for the thermal expansion of the piping.</li> <li>✓ The suction lift line/suction headline has been laid with a rising/downward slope towards the pump.</li> </ul>

		<ul style="list-style-type: none"> <li>✓ The nominal diameters of the pipelines are at least equal to the nominal diameters of the pump nozzles.</li> <li>✓ To prevent excessive pressure losses, adapters to larger diameters have a diffuser angle of approximately 8°.</li> <li>✓ Thoroughly clean, flush and blow through all vessels, pipelines, and connections (especially of new in</li> <li>✓ Before installing the pump in the piping, remove the flange covers on the suction and discharge nozzles of the pump.</li> <li>✓ Use a filter with laid-in wire mesh (mesh width 0.5 mm, wire diameter 0.25 mm) of corrosion-resistant material. Use a filter three times the diameter of the piping. Conical filters have proved suitable.</li> <li>✓ The volute casing and casing/discharge cover take on the same temperature as the fluid handled.</li> <li>✓ Make sure the space between the casing cover/discharge cover and the bearing cover is sufficiently vented.</li> <li>✓ Never close or cover the perforation of the bearing bracket guards.</li> <li>✓ Never insulate the casing cover and the bearing bracket.</li> <li>✓ Make sure that the coupling is correctly aligned at all times.</li> <li>✓ Always check the coupling after the pump has been installed and connected to the piping.</li> <li>✓ Also, check the coupling of pump sets supplied with pump and motor mounted on the same baseplate.</li> <li>✓ Before installing the pump in the piping, remove the flange covers on the suction and discharge nozzles of the pump.</li> <li>✓ Use a filter with laid-in wire mesh (mesh width 0.5 mm, wire diameter 0.25 mm) of corrosion-resistant material. Use a filter three times the diameter of the piping. Conical filters have proved suitable.</li> <li>✓ The volute casing and casing/discharge cover take on the same temperature as the fluid handled.</li> <li>✓ Make sure the space between the casing cover/discharge cover and the bearing cover is sufficiently vented.</li> <li>✓ Never close or cover the perforation of the bearing bracket guards.</li> <li>✓ Never insulate the casing cover and the bearing bracket.</li> </ul>
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		<ul style="list-style-type: none"> <li>✓ Make sure that the coupling is correctly aligned at all times.</li> <li>✓ Always check the coupling after the pump has been installed and connected to the piping.</li> <li>✓ Also, check the coupling of pump sets supplied with pump and motor mounted on the same baseplate.</li> <li>✓ Insert shims underneath the motor feet until the difference in shaft center height has been compensated.</li> <li>✓ Re-tighten the hexagon head bolts.</li> <li>✓ Check that the coupling and shaft can easily be rotated by hand.</li> <li>✓ Always operate the pump set with a coupling guard. If the customer specifically requests not to include a coupling guard in Vendor's delivery, then the operator must supply one! Observe all relevant regulations for selecting a coupling guard.</li> <li>✓ Reinstall the coupling guard and step guard, if any.</li> <li>✓ Check the distance between coupling and coupling guard. The coupling guard must not touch the coupling.</li> <li>✓ Check the available mains voltage against the data on the motor nameplate.</li> <li>✓ Select an appropriate start-up method.</li> <li>✓ Change the motor's direction of rotation to match that of the pump.</li> <li>✓ Observe the manufacturer's product literature supplied with the motor. Never check the direction of rotation by starting up the unfilled pump set. Separate the pump from the motor to check the direction of rotation.</li> <li>✓ Never insert your hands or any other objects into the pump. Check that the inside of the pump is free from any foreign objects.</li> <li>✓ The correct direction of rotation of the motor and pump is in the clockwise direction (seen from the motor end). If the direction of rotation is incorrect, check the connection of the motor and the switchgear, if any.</li> </ul>
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### 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"> <li>✓ Prepare for drainage system installation activities</li> <li>✓ Co-ordinate installation work</li> <li>✓ Prepare the site for installation of drainage system</li> <li>✓ Undertake installation of drainage system</li> <li>✓ Complete installation of drainage system</li> </ul>
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 surface and/or subsurface drainage systems.  Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.
4	Demonstrate how to properly coordinate installation work	As the students attend the practical test to assess their skill in coordinating installation work, make sure the student use the proper techniques and the information he shared is accurate.

#### 4. OQ=Oral Questioning

#	Questions	Answers
1	Prepare for drainage system installation activities	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ The construction site for the drainage system and construction method is identified according to the site and drainage system plans and enterprise work procedures.</li> <li>✓ Materials, tools, equipment and machinery are selected according to drainage system design requirements and enterprise work procedures.</li> <li>✓ Pre-operational and safety checks are carried out on tools, equipment and machinery according to manufacturer's specifications and enterprise work procedures.</li> <li>✓ OHS hazards are identified, risks assessed, controls implemented and reported to the supervisor.</li> <li>✓ Suitable safety and personal protective equipment (PPE) are selected, used and maintained.</li> </ul>
2	Co-ordinate installation work	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ Enterprise work team, contractors and design consultants are identified and work tasks are</li> </ul>



		<p>coordinated in a sequential, timely and effective manner in consultation with the supervisor.</p> <ul style="list-style-type: none"> <li>✓ Installation of the drainage system is undertaken according to OHS requirements and with due consideration of the environmental implications and relevant legislation and regulations.</li> <li>✓ A clean and safe work area is maintained throughout and on completion of work.</li> </ul>
3	Prepare the site for installation of drainage system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Symbols and terminology are interpreted to ensure the concept of the drainage system plan is clearly understood according to industry practice.</li> <li>✓ Layout of services is identified, depths checked against the site or drainage system plan and discrepancies are reported to the supervisor and the relevant authority.</li> <li>✓ Survey, measurement and marking out of the site and confirmation of soil characteristics relevant to the planned drainage system are completed according to plan specifications and enterprise work procedures.</li> </ul>
4	Undertake installation of drainage system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Excavations are completed without damage to services, facilities, features and established plants according to plan specifications and enterprise work procedures.</li> <li>✓ The drainage system is installed according to the drainage system plan and enterprise work procedures.</li> <li>✓ The drainage system is tested for configuration, flow rates and capacity consistent with the drainage system plan and according to enterprise work procedures.</li> <li>✓ The supervisor is consulted and remedial action is taken when the drainage system operation does not meet the plan specifications.</li> </ul>
5	Complete installation of drainage system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Earthworks are finished off to the plan specifications and enterprise work procedures.</li> <li>✓ The site is restored and waste material is removed from the site and disposed of in an environmentally aware and safe manner according to enterprise work procedures.</li> <li>✓ Tools, equipment and machinery are cleaned, maintained and stored according to enterprise work procedures.</li> <li>✓ Work outcomes are recorded or reported to the supervisor according to enterprise work procedures.</li> </ul>

## 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-12: Install sewerage pump station and sea outfall

Unit No	12
Unit Title	Install sewerage pump station and sea outfall
Unit Code	CONS05CR08V1/21

### 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 *
<b>1. Prepare for work</b>							
Identify work requirements	✓	✓	✓	✓	✓	✓	✓
Identify and control hazards	✓		✓	✓	✓		✓
Coordinate with appropriate personnel	✓	✓	✓	✓	✓	✓	✓
<b>2. Startup compressor systems / Equipment</b>							
Perform pre-start-up checks	✓	✓	✓	✓	✓	✓	✓
Check the status of the system/equipment prior to commencing start-up process	✓		✓	✓	✓		✓
Check all required auxiliary systems, including oil and water, to confirm their operational condition	✓	✓	✓	✓	✓	✓	✓
Startup individual items of equipment and the entire compressor system as required	✓	✓	✓		✓	✓	✓
Bring the system to required operating conditions		✓	✓	✓		✓	✓
<b>3. Control and monitor the compressor system</b>							
Initiate load-up through the selection of appropriate speed or cycle	✓	✓	✓	✓	✓	✓	✓
Monitor and adjust downstream equipment as required	✓		✓	✓	✓		✓
Monitor the operational condition and safety status of the unit/system and take appropriate action	✓	✓	✓	✓	✓	✓	✓
Adjust operational speeds and operating cycles as required	✓	✓	✓		✓	✓	✓
Monitor or activate safety systems to ensure that any system shutdowns are controlled and conducted safely and effectively		✓	✓	✓		✓	✓
<b>4. Shut down compressor systems/equipment</b>							
Confirm shutdown cause with other personnel and plant operators before commencing to isolate or shut down the equipment/system	✓	✓	✓	✓	✓	✓	✓

Implement control measures to minimize damage and hazards	✓		✓	✓	✓		✓
Shut down system according to procedures	✓	✓	✓	✓	✓	✓	✓
Inspect the system/equipment as required by procedures	✓	✓	✓		✓	✓	✓
Isolate and purge systems/equipment and prepare plant for maintenance as required		✓	✓	✓		✓	✓
<b>5. Maintain plant effectiveness</b>							
Frequently and critically monitor all plant throughout shift	✓	✓	✓	✓	✓	✓	✓
Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant	✓		✓	✓	✓		✓
Identify critical equipment/processes and tune their performance	✓	✓	✓	✓	✓	✓	✓
Identify issues likely to impact on plant performance and take appropriate action	✓	✓	✓		✓	✓	✓
Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people		✓	✓	✓		✓	✓
Test trips and alarms as required	✓	✓	✓	✓	✓	✓	✓

**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 three ways in which employers and workers can identify and assess hazards.	<ul style="list-style-type: none"> <li>✓ Collect and review information about the hazards present or likely to be present in the workplace.</li> <li>✓ Conduct initial and periodic workplace inspections of the workplace to identify new or recurring hazards.</li> <li>✓ Investigate injuries, illnesses, incidents, and close calls/near misses to determine the underlying hazards, their causes, and safety and health program shortcomings.</li> <li>✓ Group similar incidents and identify trends in injuries, illnesses, and hazards reported.</li> <li>✓ Consider hazards associated with emergency or nonroutine situations.</li> <li>✓ Determine the severity and likelihood of incidents that could result for each hazard identified, and use this information to prioritize corrective actions.</li> </ul>
2	Identify the six steps that can be taken to identify and assess hazards in the workplace.	<ol style="list-style-type: none"> <li>7. Collect existing information about workplace hazards</li> <li>8. Inspect the workplace for safety hazards</li> <li>9. Identify health hazards</li> <li>10. Conduct incident investigations</li> <li>11. Identify hazards associated with emergency and non-routine situations</li> </ol>

		<ul style="list-style-type: none"> <li>✓ Characterize the nature of identified hazards, identify interim control measures, and prioritize the hazards for control</li> </ul>
3	Explain in detail how you can collect existing information about workplace hazards.	<ul style="list-style-type: none"> <li>✓ Equipment and machinery operating manuals.</li> <li>✓ Safety Data Sheets (SDS) provided by chemical manufacturers.</li> <li>✓ Self-inspection reports and inspection reports from insurance carriers, government agencies, and consultants.</li> <li>✓ Records of previous injuries and illnesses, such as OSHA 300 and 301 logs and reports of incident investigations.</li> <li>✓ Workers' compensation records and reports.</li> <li>✓ Patterns of frequently-occurring injuries and illnesses.</li> <li>✓ Exposure monitoring results, industrial hygiene assessments, and medical records (appropriately redacted to ensure patient/worker privacy).</li> <li>✓ Existing safety and health programs (lockout/tagout, confined spaces, process safety management, personal protective equipment, etc.).</li> <li>✓ Input from workers, including surveys or minutes from safety and health committee meetings.</li> <li>✓ Results of job hazard analyses, also known as job safety analyses.</li> </ul>
4	Explain in detail how you can inspect the workplace for safety hazards.	<ul style="list-style-type: none"> <li>✓ Conduct regular inspections of all operations, equipment, work areas and facilities. Have workers participate on the inspection team and talk to them about hazards that they see or report.</li> <li>✓ Be sure to document inspections so you can later verify that hazardous conditions are corrected. Take photos or video of problem areas to facilitate later discussion and brainstorming about how to control them, and for use as learning aids.</li> <li>✓ Include all areas and activities in these inspections, such as storage and warehousing, facility and equipment maintenance, purchasing and office functions, and the activities of on-site contractors, subcontractors, and temporary employees.</li> <li>✓ Regularly inspect both plant vehicles (e.g., forklifts, powered industrial trucks) and transportation vehicles (e.g., cars, trucks).</li> <li>✓ Use checklists that highlight things to look for. Typical hazards fall into several major categories, such as those listed below; each workplace will have its own list: <ul style="list-style-type: none"> <li>○ General housekeeping</li> <li>○ Slip, trip, and fall hazards</li> <li>○ Electrical hazards</li> <li>○ Equipment operation</li> </ul> </li> </ul>

		<ul style="list-style-type: none"> <li>○ Equipment maintenance</li> <li>○ Fire protection</li> <li>○ Work organization and process flow (including staffing and scheduling)</li> <li>○ Work practices</li> <li>○ Workplace violence</li> <li>○ Ergonomic problems</li> <li>○ Lack of emergency procedures</li> </ul> <p>✓ Before changing operations, workstations, or workflow; making major organizational changes; or introducing new equipment, materials, or processes, seek the input of workers and evaluate the planned changes for potential hazards and related risks</p>
5	Explain in detail how you can identify health hazards.	<p>✓ Identify chemical hazards –review SDS and product labels to identify chemicals in your workplace that have low exposure limits, are highly volatile, or are used in large quantities or in unventilated spaces. Identify activities that may result in skin exposure to chemicals.</p> <p>✓ Identify physical hazards –identify any exposures to excessive noise (areas where you must raise your voice to be heard by others), elevated heat (indoor and outdoor), or sources of radiation (radioactive materials, X-rays, or radiofrequency radiation).</p> <p>✓ Identify biological hazards –determine whether workers may be exposed to sources of infectious diseases, molds, toxic or poisonous plants, or animal materials (fur or scat) capable of causing allergic reactions or occupational asthma.</p> <p>✓ Identify ergonomic risk factors –examine work activities that require heavy lifting, work above shoulder height, repetitive motions, or tasks with significant vibration.</p> <p>✓ Conduct quantitative exposure assessments –when possible, using air sampling or direct reading instruments.</p> <p>✓ Review medical records –to identify cases of musculoskeletal injuries, skin irritation or dermatitis, hearing loss, or lung disease that may be related to workplace exposures.</p>
6	Explain in detail how you can conduct incident investigations.	<p>✓ Develop a clear plan and procedure for conducting incident investigations, so that an investigation can begin immediately when an incident occurs. The plan should cover items such as:</p> <ul style="list-style-type: none"> <li>○ Who will be involved</li> <li>○ Lines of communication</li> <li>○ Materials, equipment, and supplies needed</li> <li>○ Reporting forms and templates</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Train investigative teams on incident investigation techniques, emphasizing objectivity and open-mindedness throughout the investigation process.</li> <li>✓ Conduct investigations with a trained team that includes representatives of both management and workers.</li> <li>✓ Investigate close calls/near misses.</li> <li>✓ Identify and analyze root causes to address underlying program shortcomings that allowed the incidents to happen.</li> <li>✓ Communicate the results of the investigation to managers, supervisors, and workers to prevent recurrence.</li> </ul>
7	Explain in detail how you can identify hazards associated with emergency and non-routine situations.	<ul style="list-style-type: none"> <li>✓ Identify foreseeable emergency scenarios and non-routine tasks, taking into account the types of material and equipment in use and the location within the facility. Scenarios such as the following may be foreseeable: <ul style="list-style-type: none"> <li>○ Fires and explosions</li> <li>○ Chemical releases</li> <li>○ Hazardous material spills</li> <li>○ Startups after planned or unplanned equipment shutdowns</li> <li>○ Non-routine tasks, such as infrequently performed maintenance activities</li> <li>○ Structural collapse</li> <li>○ Disease outbreaks</li> <li>○ Weather emergencies and natural disasters</li> <li>○ Medical emergencies</li> </ul> </li> <li>✓ Workplace violence</li> </ul>
8	Explain in detail how you can characterize the nature of identified hazards, identify interim control measures, and prioritize the hazards for control.	<ul style="list-style-type: none"> <li>✓ Evaluate each hazard by considering the severity of potential outcomes, the likelihood that an event or exposure will occur, and the number of workers who might be exposed.</li> <li>✓ Use interim control measures to protect workers until more permanent solutions can be implemented.</li> <li>✓ Prioritize the hazards so that those presenting the greatest risk are addressed first. Note, however, that employers have an ongoing obligation to control all serious recognized hazards and to protect workers.</li> </ul>
9	Define task analysis.	<ul style="list-style-type: none"> <li>✓ It is a structured framework that dissects a job and arrives at a reliable method of describing it across time and people by composing a detailed listing of all the tasks.</li> </ul>
10	What does a task analysis contain?	<ul style="list-style-type: none"> <li>✓ Task frequency</li> <li>✓ Difficulty of learning</li> <li>✓ Importance to train</li> <li>✓ Task criticality</li> <li>✓ Task difficulty</li> <li>✓ Overall task importance</li> </ul>

11	Define task statement.	<ul style="list-style-type: none"> <li>✓ A task statement is composed of an action and a result (product).</li> </ul>
12	What are task steps?	<ul style="list-style-type: none"> <li>✓ Task steps (also known as performance steps) are the step-by-step instructions for performing the process.</li> </ul>
13	Demonstrate how to order manufacturing parts when the system flags a part as being low in stock	<ul style="list-style-type: none"> <li>✓ Look up usage for the item for the previous 12 month period.</li> <li>✓ Calculate the average monthly use.</li> <li>✓ Add the planned growth rate for the product line.</li> <li>✓ Check parts catalogs or call the source for best buy rates.</li> <li>✓ Check with planned usage tables or the business unit to ensure that the part will not go out of specifications for the best calculated buy period.</li> <li>✓ Place purchase order.</li> </ul>
14	List the four main methods for determining steps in a task analysis.	<ul style="list-style-type: none"> <li>✓ Hierarchical Task Analysis - arranging by order of actions</li> <li>✓ IF and THEN Analysis - If and then relationship</li> <li>✓ Model Based Analysis - possible actions listed</li> <li>✓ Cognitive Task Analysis - critical decision based</li> </ul>
15	IF text is a word, THEN?	<ul style="list-style-type: none"> <li>✓ move cursor to middle of word</li> <li>✓ double-click mouse button</li> </ul>
16	IF text is a section of words or letters, THEN?	<ul style="list-style-type: none"> <li>✓ move cursor to beginning of text</li> <li>✓ press mouse button down</li> <li>✓ move cursor to end of text</li> <li>✓ release mouse button</li> </ul>
17	What is the Model Based Analysis method used for?	<ul style="list-style-type: none"> <li>✓ This method is often used for professional tasks as the steps for performing certain tasks can be extremely vague to define.</li> </ul>
18	List some acceptable techniques used in model based analysis.	<ul style="list-style-type: none"> <li>✓ use examples of others</li> <li>✓ have them form a picture in their minds of what they are trying to learn</li> <li>✓ help them gain and understand necessary information</li> <li>✓ apply the task to their job</li> <li>✓ present information using visual, auditory, and kinesthetic methods</li> <li>✓ practice the task</li> </ul>
19	Define cognitive task analysis.	<ul style="list-style-type: none"> <li>✓ A Cognitive Task Analysis is directed at the psychological processes underlying the performance and the subtle cues that may depend on context and experience.</li> </ul>
20	What is the main goal of a cognitive task analysis?	<ul style="list-style-type: none"> <li>✓ To define the actual decision requirements of the task.</li> </ul>
21	How can the actual decision requirements of the task be defined?	<ul style="list-style-type: none"> <li>✓ Mapping out the task using task analysis (traditional task analysis).</li> <li>✓ Identifying the critical decision points.</li> <li>✓ Clustering and linking the decision points.</li> <li>✓ Prioritizing the decision points.</li> </ul>



		<ul style="list-style-type: none"> <li>✓ Diagnosing and characterizing the decisions as to the strategies used, cues signaling the decision points, and the inferences made regarding cues and decision points.</li> </ul>
22	Explain the difference between task analysis and cognitive task analysis.	<ul style="list-style-type: none"> <li>✓ Task analysis focuses mainly on observable behavior and does not offer information on overall organization of knowledge. A cognitive task analysis is directed at the psychological processes underlying the behavior. Cognitive task analysis concentrates on the critical decisions and cognitive processes that separate the expert from the novice.</li> </ul>
23	Define duties.	<ul style="list-style-type: none"> <li>✓ Duties are a combination of related or like tasks.</li> </ul>
24	What is the purpose of team task analysis?	<ul style="list-style-type: none"> <li>✓ The purpose of the team task analysis will dictate if the focus is to be upon team tasks, team processes, individual task-work, or some combination of the three.</li> </ul>
25	Identify three elements of coordinating with others.	<ul style="list-style-type: none"> <li>✓ Clear communication</li> <li>✓ Understanding each other's personality types</li> <li>✓ Get organized</li> </ul>

## 2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to installing sewerage pump station and sea outfall, 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"> <li>✓ Prepare for work</li> <li>✓ Startup compressor systems / Equipment</li> <li>✓ Control and monitor the compressor system</li> <li>✓ Shut down compressor systems/equipment</li> <li>✓ Maintain plant effectiveness</li> </ul>
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"> <li>✓ Prepare for work</li> <li>✓ Startup compressor systems / Equipment</li> <li>✓ Control and monitor the compressor system</li> <li>✓ Shut down compressor systems/equipment</li> <li>✓ Maintain plant effectiveness</li> </ul>
4	Demonstrate how to accurately identify health hazards	<p>The student is expected to follow the correct step-by-step process to identifying health hazards. The elements which should be assessed are:</p> <ul style="list-style-type: none"> <li>✓ Identify chemical hazards</li> <li>✓ Identify physical hazards</li> <li>✓ Identify biological hazards</li> <li>✓ Identify ergonomic risk factors</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Conduct quantitative exposure assessments</li> <li>✓ Review medical records</li> </ul>
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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"> <li>✓ Prepare for work</li> <li>✓ Startup compressor systems / Equipment</li> <li>✓ Control and monitor the compressor system</li> <li>✓ Shut down compressor systems/equipment</li> <li>✓ Maintain plant effectiveness</li> </ul>
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 operating and monitoring of a complex compressor system and associated equipment.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Knowledge about starting and stopping the sewerage treatment plant	As the students attend the practical test to assess their skills in starting and stopping the sewerage treatment plant, 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"> <li>✓ Identify work requirements</li> <li>✓ Identify and control hazards</li> <li>✓ Coordinate with appropriate personnel</li> </ul>
2	Startup compressor systems / Equipment	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Perform pre-start-up checks</li> <li>✓ Check the status of the system/equipment prior to commencing start-up process</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Check all required auxiliary systems, including oil and water, to confirm their operational condition</li> <li>✓ Startup individual items of equipment and the entire compressor system as required</li> <li>✓ Bring the system to required operating conditions.</li> </ul>
3	Control and monitor the compressor system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Initiate load-up through the selection of appropriate speed or cycle</li> <li>✓ Monitor and adjust downstream equipment as required</li> <li>✓ Monitor the operational condition and safety status of the unit/system and take appropriate action</li> <li>✓ Adjust operational speeds and operating cycles as required</li> <li>✓ Monitor or activate safety systems to ensure that any system shutdowns are controlled and conducted safely and effectively</li> </ul>
4	Shut down compressor systems/equipment	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Confirm shutdown cause with other personnel and plant operators before commencing to isolate or shut down the equipment/system</li> <li>✓ Implement control measures to minimize damage and hazards</li> <li>✓ Shut down system according to procedures</li> <li>✓ Inspect the system/equipment as required by procedures</li> <li>✓ Isolate and purge systems/equipment and prepare plant for maintenance as required</li> </ul>
5	Maintain plant effectiveness	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Frequently and critically monitor all plant throughout shift</li> <li>✓ Use measured/indicated data and smell, sight, sound and feel as appropriate to monitor plant</li> <li>✓ Identify critical equipment/processes and tune their performance</li> <li>✓ Identify issues likely to impact on plant performance and take appropriate action</li> <li>✓ Predict impact of a change in one unit/area on other plant units/areas and communicate this to relevant people</li> <li>✓ Test trips and alarms as required</li> </ul>

## 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-13: Operate and maintain Sewerage Treatment Plant (STP)

Unit No	13
Unit Title	Operate and maintain Sewerage Treatment Plant (STP)
Unit Code	CONS05CR09V1/21

### 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 *
<b>1. Operate system according to procedure</b>							
Receive and give shift handover	✓	✓	✓	✓	✓	✓	✓
Communicate with personnel to identify and coordinate work requirements	✓		✓	✓	✓		✓
Identify, control and report process system hazards	✓	✓	✓	✓	✓	✓	✓
Check for recent work undertaken on stations and address outstanding and incomplete work	✓	✓	✓		✓	✓	✓
Check operational status of process system		✓	✓	✓		✓	✓
Perform routine checks and complete logs and paperwork, taking action on unexpected readings	✓	✓	✓	✓	✓	✓	✓
Adjust process system according to agreed operational parameters		✓	✓	✓		✓	✓
<b>2. Produce varieties of goods from short and sweet pastry</b>							
Monitor station frequently and critically throughout shift using own senses, and measured and indicated data	✓	✓	✓	✓	✓	✓	✓
Monitor field data and instrumentation to ensure that product remains on specification	✓		✓	✓	✓		✓
Identify impacts of changes upstream and downstream	✓	✓	✓	✓	✓	✓	✓
Identify actual and developing situations that may require action	✓	✓	✓		✓	✓	✓
Take action to remedy abnormal situations according to operating procedures		✓	✓	✓		✓	✓
Complete required documents outlining abnormal situation management and corrective action taken	✓	✓	✓	✓	✓	✓	✓
<b>3. Shut down and prepare system for maintenance</b>							
Prepare process system to be shut down according to operating procedures	✓	✓	✓	✓	✓	✓	✓

Complete pre-shutdown checks according to operating procedures	✓		✓	✓	✓		✓
Shut down process system according to operating procedures	✓	✓	✓	✓	✓	✓	✓
Identify, control and report shutdown hazards	✓	✓	✓		✓	✓	✓
Monitor shutdown and identify abnormal situations that may require action		✓	✓	✓		✓	✓
Take action to remedy abnormal situations according to operating procedures	✓	✓	✓	✓	✓	✓	✓
Shut down and changeover duty and standby equipment according to operating procedures		✓	✓	✓		✓	✓
Isolate process system from energy sources	✓	✓	✓	✓	✓	✓	✓
<b>4. Prepare and start system</b>							
De-isolate and prepare process system to be returned to standby or service	✓	✓	✓	✓	✓	✓	✓
Complete pre-start checks according to operating procedures	✓		✓	✓	✓		✓
Startup process system according to operating procedures	✓	✓	✓	✓	✓	✓	✓
Identify, control and report startup hazards	✓	✓	✓		✓	✓	✓
Monitor startup and identify abnormal situations that may require action		✓	✓	✓		✓	✓
Take action to remedy abnormal situations according to operating procedures	✓	✓	✓	✓	✓	✓	✓
<b>5. Clean up</b>							
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	Identify types of pumping stations.	<ul style="list-style-type: none"> <li>✓ Horizontal pumps in dry pit</li> <li>✓ Vertical pumps in dry pit</li> <li>✓ Vertical pumps in suction well</li> <li>✓ Submersible pumps in suction pump</li> </ul>
2	What is a suction sump/wet well?	A sewage receiving sump.

3	Explain what should be considered when determining the size of a dry pit.	The size of the dry pit should be adequate for the number of pumps planned and should be such as to handle the sewage load at the desired pumping capacity. Allowance should also be made for future requirements of additional or larger pumps. In the configuration, (a) separate dry pit and wet well are required: one to hold the sewage, and one to house the pumps and appurtenances. This option is required for installations where the pumps will otherwise need separate priming and where-as otherwise long suction pipes are needed.
4	Explain what a dry pit is used for.	It is typically used to pump large volumes of raw sewage, where uninterrupted flow is critical and sewage solids could clog suction piping. It is also used to pump solids in pipe galleries between digesters or other solids-handling equipment. While construction costs may be higher and a heating, ventilation and cooling system is necessary when installed below the floor level, this configuration is best for O&M activities because operators can see and touch the equipment.
5	Define sewage sump.	Sewage sump is a compartment or tank in which sewage is collected.
6	How are wet wells typically designed?	Wet wells are typically designed to prevent rapid pump cycling but small enough to prevent a long detention time and associated odour release.
7	What is used to minimize pump clogging problems?	Bar screens or grinders are often installed in or upstream of the wet well.
8	Instead of manually operated screens at the bottom, what is better to install?	It is better to install mechanical bar screens.
9	Why is it better to install mechanical bar screens?	It can automatically remove the screenings and lift the same safely above the ground level. There can also be two such screens one after the other for coarse screenings and fine screenings. This will require rectangular channels to maintain longitudinal non-turbulent linear flow
10	Explain the procedure when using lift stations.	The procedure is to sink a wet well on the road shoulder or an acquired plot after the shoulder and divert the deeper sewer there. The submersible pump will lift the sewage and discharge it to the next on line shallow sewer.
11	What points should be taken into consideration when it comes to the operation of the pumps?	<ul style="list-style-type: none"> <li>✓ Dry running of the pumps should be avoided.</li> <li>✓ Centrifugal pumps if installed with negative suction should be primed before starting.</li> <li>✓ Pumps should be operated only within the recommended range of the head-discharge characteristics of the pump. <ul style="list-style-type: none"> <li>○ If pump is operated at a point away from duty point, the pump efficiency normally reduces.</li> <li>○ Operation near the shut-off point should be avoided, as it causes substantial recirculation within the pump, resulting in overheating of sewage in the casing and consequently, overheating of the pump.</li> </ul> </li> <li>✓ As far as possible positive suction is to be provided to avoid priming during design itself.</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Voltage during operation of the pump-motor set should be within <math>\pm 10\%</math> of the rated voltage. Similarly, current should be below the rated current shown on the name plate of the motor.</li> <li>✓ When parallel pumps are to be operated, the pumps should be started and stopped with a time lag between two pumps to restrict change of flow velocity to minimum and to restrict the dip in voltage in the incoming feeder and should be adequate to allow the pump head to stabilise.</li> <li>✓ When the pumps are to be operated in series, they should be started and stopped sequentially, but with minimum time lag. Any pump next in sequence should be started immediately after the delivery valve of the previous pump is even partly opened. Due care should be taken to keep open the air vent of the pump next in sequence, before starting that pump.</li> <li>✓ The stuffing box should allow a drip of leakage to ensure that no air passes into the pump and that the packing gets adequate wetness for cooling and lubrication. When the stuffing box is sealed with grease, adequate refill of the grease should be maintained.</li> <li>✓ The running of duty pumps and standby pumps should be scheduled so that no pump remains idle for a long period and all pumps are in ready-to-run condition. Similarly, the running schedules should be ensured so that all pumps do not wear equally needing simultaneous overhaul.</li> <li>✓ If any undue vibration or noise is noticed, the pump should be stopped immediately and the cause for vibration or noise should be checked and rectified.</li> <li>✓ Generally, the number of starts per hour shall not exceed four. Frequent starting and stopping should be avoided as each start causes overloading of motor, starter, contactor and contacts. Although overloading lasts only for a few seconds, it reduces the life of the equipment.</li> <li>✓ Troubles in a sewage pumping station can be mostly traced to the design stage itself. This is all the more true when too much grit is likely to come into the sewage pumping stations from sewage at monsoon time, which is difficult to handle. Hence, sewers should not collect any storm water.</li> </ul>
12	What undesirable operations should be avoided?	<ul style="list-style-type: none"> <li>✓ Operation at higher head A pump should never be operated at a head higher than the maximum recommended head otherwise such operation may result in excessive recirculation in the pump, and overheating of the sewage and the pump. Another problem that arises if a pump is operated at a head higher than the recommended maximum head is that the radial reaction on the pump shaft increases</li> </ul>



		<p>causing excessive unbalanced forces on the shaft, which may cause failure of the pump shaft. As a useful guide, appropriate marking should be made on the pressure gauge. Efficiency at a higher head is normally low and such an operation is also inefficient.</p> <ul style="list-style-type: none"> <li>✓ Operation at lower head If a pump is operated at a lower head than the recommended minimum head, the radial reaction on the pump shaft increases causing excessive unbalanced forces on the shaft, which may cause premature wear of bearings and possibly shaft failure if persisted. As a useful guide appropriate marking should be made on both pressure gauge and ammeter. Efficiency at a lower head is normally low, hence such an operation is inefficient. In such cases, it is advisable to throttle the delivery side valve to create more head to work within safe head. This will also reduce the power. If this is a design flaw additional head has to be created at tail end by elevating the delivery. However, these are not energy efficient solutions; change of impeller to suit the actual head is the solution.</li> <li>✓ Operation on higher suction lift If a pump is operated on suction lift higher than the permissible value, pressures at the eye of impeller and the suction side fall below vapour pressure. This results in flashing of sewage into vapour. These vapour bubbles collapse during passage, resulting in cavitation in the pump, causing pitting on the suction side of impeller and casing, and excessive vibrations. In addition to mechanical damage due to pitting, pump discharge also reduces drastically.</li> </ul>
13	Identify three points commonly seen on a maintenance checklist for a basic pumping station.	<ul style="list-style-type: none"> <li>✓ Check the wet well level continuously (whenever necessary).</li> <li>✓ Record each pump's "run time" hours (as indicated on the elapsed-time meters) at least once in a day and confirm that the pumps' running hours are equal.</li> <li>✓ Ensure that the control-panel switches are in their proper positions.</li> <li>✓ Ensure that the valves are in their proper positions.</li> <li>✓ Check for unusual pump noises.</li> <li>✓ At least once a week, manually pump down the wet well to check for and to remove debris that may clog the pumps.</li> </ul>
14	State a consequence of excessive head losses on either the suction or the discharge side of the pump.	Increase energy use and wear rate.
15	When operators notice excessive head losses, what should they be determining?	They should determine whether the losses are a result of partial clogging, a restriction somewhere in the line, or materials built up on the pipe wall.

16	What should the operator do if something is caught in a valve or other appurtenance?	If something is caught in a valve or other appurtenance, the operator should stop the pump and physically open out the valve head and remove the blockage. In smaller pumps, it is easier to remove the entire valve, disassemble and remove the blockage, reassemble and refit. During such time, other pumps shall be run. Scum build-up problems typically are addressed via source control (for instance, by installing grease traps in the collection system at locations suspected or known to generate grease, such as restaurants, etc.).
17	Define sluice gate.	A sluice gate is traditionally a wooden or metal plate, which slides in grooves in the sides of the guide channel.
18	What are sluice gates commonly used for?	Sluice gates are commonly used to control sewage levels in STPs.
19	Identify three things that should be considered for proper operation of a sluice gate.	<ul style="list-style-type: none"> <li>✓ Test for proper operation Operate inactive sluice gates by smearing grease on stem threads.</li> <li>✓ Clean and paint Clean sluice gate with wire brush and paint with proper corrosion-resistant paint.</li> <li>✓ Adjust for proper clearance.</li> <li>✓ For gates seated against pressure, check and adjust top, bottom, and side wedges until each wedge applies nearly uniform pressure against gate in the closed position. This shall be done by the manufacturer and not the operator</li> </ul>
20	What should be done in regards of proper operation of a sluice gate?	<ul style="list-style-type: none"> <li>✓ Operate the gate at least once in every three months.</li> <li>✓ Check the nuts of all construction and foundation bolts once in a year. Tighten the bolts, if loose.</li> <li>✓ Examine the entire painted surface for any signs of damage to the protective paint.</li> </ul>
21	What shouldn't be done in regards of proper operation of a sluice gate?	<ul style="list-style-type: none"> <li>✓ Do not remove lock plates until the gate has been properly installed.</li> <li>✓ Do not keep the gate out of operation for more than three months.</li> <li>✓ Do not forget to set the stop nut in the correct position</li> <li>✓ Do not disturb the adjustment of wedge block bolts/studs.</li> <li>✓ Do not over torque the crank handle/hand wheel.</li> </ul>
22	What equipment is necessary on the delivery side of centrifugal pumps?	Non-return valve.
23	Why is a non-return valve necessary on the delivery side of centrifugal pumps?	To prevent back-pressure from the delivery head on the pump, when the pump is shut off.
24	What should be used to avoid water-hammer?	Anti-slam device such as lever dead-weight type, spring-loading type or dash pot type.
25	Define gate valve.	A gate valve is a valve that opens by lifting a round or rectangular gate/wedge out of the path of the fluid.

## 2. PT=Practical Test

#	Practical Activity	Additional details related to the activity
1	Student Assignments	Students need to undertake assignments related to operating and maintaining Sewerage Treatment Plant (STP), 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"> <li>✓ Operate system according to procedure</li> <li>✓ Identify and respond to abnormal situations during operation</li> <li>✓ Shut down and prepare system for maintenance</li> <li>✓ Prepare and start system</li> <li>✓ Clean up</li> </ul>
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"> <li>✓ Operate system according to procedure</li> <li>✓ Identify and respond to abnormal situations during operation</li> <li>✓ Shut down and prepare system for maintenance</li> <li>✓ Prepare and start system</li> <li>✓ Clean up</li> </ul>
4	Demonstrate how to carry out gate valve maintenance	The student is expected to follow the correct step-by step process to maintaining gate valves. The elements which should be assessed are: <ul style="list-style-type: none"> <li>✓ Replace packing: Modern gate valves can be repacked without removing them from service. Before repacking, open the valve wide. This prevents excessive leakage when the packing or the entire stuffing box is removed. It draws the stem collar tightly against the bonnet bushing on a rising stem valve.</li> <li>✓ Operate valve: Operate inactive gate valves to prevent sticking.</li> <li>✓ Lubricate gearing: Lubricate gate valves as recommended by the manufacturer. Lubricate thoroughly any gearing in large gate valves. Wash open gears with solvent and lubricate with grease.</li> <li>✓ Lubricate rising stem threads: Clean threads on rising stem gate valves and lubricate with grease.</li> <li>✓ Lubricate buried valves: If a buried valve is hard for working, lubricate it by pouring oil down through a pipe that is bent at the top end oiling the packing follower below the valve nut.</li> </ul>

### 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"> <li>✓ Operate system according to procedure</li> <li>✓ Identify and respond to abnormal situations during operation</li> <li>✓ Shut down and prepare system for maintenance</li> <li>✓ Prepare and start system</li> <li>✓ Clean up</li> </ul>
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 operating and maintaining Sewerage Treatment Plant.</p> <p>Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.</p>
4	Knowledge about butterfly valve maintenance	As the students attend the practical test to assess their knowledge on how to properly maintain butterfly valves, make sure the student use the proper techniques and the information he shared is accurate.

### 4. OQ=Oral Questioning

#	Questions	Answers
1	Operate system according to procedure	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Receive and give shift handover</li> <li>✓ Communicate with personnel to identify and coordinate work requirements</li> <li>✓ Identify, control and report process system hazards</li> <li>✓ Check for recent work undertaken on stations and address outstanding and incomplete work</li> <li>✓ Check operational status of process system</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Perform routine checks and complete logs and paperwork, taking action on unexpected readings</li> <li>✓ Adjust process system according to agreed operational parameters</li> </ul>
2	Identify and respond to abnormal situations during operation	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Monitor station frequently and critically throughout shift using own senses, and measured and indicated data</li> <li>✓ Monitor field data and instrumentation to ensure that product remains on specification</li> <li>✓ Identify impacts of changes upstream and downstream</li> <li>✓ Identify actual and developing situations that may require action</li> <li>✓ Take action to remedy abnormal situations according to operating procedures</li> <li>✓ Complete required documents outlining abnormal situation management and corrective action taken</li> </ul>
3	Shut down and prepare system for maintenance	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Prepare process system to be shut down according to operating procedures</li> <li>✓ Complete pre-shutdown checks according to operating procedures</li> <li>✓ Shut down process system according to operating procedures</li> <li>✓ Identify, control and report shutdown hazards</li> <li>✓ Monitor shutdown and identify abnormal situations that may require action</li> <li>✓ Take action to remedy abnormal situations according to operating procedures</li> <li>✓ Shut down and changeover duty and standby equipment according to operating procedures</li> <li>✓ Isolate process system from energy sources</li> </ul>
4	Prepare and start system	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ De-isolate and prepare process system to be returned to standby or service</li> <li>✓ Complete pre-start checks according to operating procedures</li> <li>✓ Start up process system according to operating procedures</li> <li>✓ Identify, control and report startup hazards</li> <li>✓ Monitor startup and identify abnormal situations that may require action</li> </ul>

		<ul style="list-style-type: none"> <li>✓ Take action to remedy abnormal situations according to operating procedures</li> </ul>
5	Clean up	<p>Make sure the students answer questions related to the following areas</p> <ul style="list-style-type: none"> <li>✓ Work area is cleared and materials disposed of, reused or recycled according to legislation, regulation, codes of practice and job specification</li> <li>✓ Tools and equipment are cleaned, checked, maintained and stored according to manufacturer recommendations and workplace procedures</li> <li>✓ Information is accessed and documentation completed according to workplace requirements</li> </ul>

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

#	Name of the Source	Information to be checked
1	<b>TRB/LB =Trainee's Record/Log Book</b>	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	<b>TR=Trainer Report</b>	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	<b>Oher Sources</b>	<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-14: Apply accident-emergency procedures

Unit No 14  
 Unit Title Apply accident-emergency procedures  
 Unit Code CONS05CR10V1/21

### 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 *
<b>1. Respond to the incident</b>							
Response to the incident or accident is in accordance with workplace emergency procedures and relevant regulatory requirements	✓	✓	✓	✓	✓	✓	✓
Details of the cause(s) and effects of the incident are identified and reported	✓		✓	✓	✓		✓
Assistance requirements for accidents and emergencies are clarified and reported immediately to the appropriate parties	✓	✓	✓	✓	✓	✓	✓
Requests for assistance are made to relevant personnel and emergency services	✓	✓	✓		✓	✓	✓
<b>2. Control and assist at accident or emergency site</b>							
Site is controlled and protected until the arrival of authorized personnel	✓	✓	✓	✓	✓	✓	✓
Assistance is provided to injured persons, within the limitations of duty of care and workplace procedures	✓		✓	✓	✓		✓
Relevant authorities at the site are cooperated with and assisted within workplace policies	✓	✓	✓	✓	✓	✓	✓
<b>3. Finalize accident - emergency process and complete records</b>							
Relevant information is exchanged in accordance with state/territory law and workplace procedures	✓	✓	✓	✓	✓	✓	✓
Documentation and reports are completed and processed in accordance with workplace and relevant regulatory 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	Identify the stages of responding to an incident.	<ol style="list-style-type: none"> <li>1. Preparation</li> <li>2. Detection and reporting</li> <li>3. Triage and analysis</li> <li>4. Containment and neutralization</li> <li>5. Post-incident activity</li> </ol>
2	In order to successfully address security events, what features should be included in an incident response plan?	<ul style="list-style-type: none"> <li>✓ Develop and Document IR Policies: Establish policies, procedures, and agreements for incident response management.</li> <li>✓ Define Communication Guidelines: Create communication standards and guidelines to enable seamless communication during and after an incident.</li> <li>✓ Incorporate Threat Intelligence Feeds: Perform ongoing collection, analysis, and synchronization of your threat intelligence feeds.</li> <li>✓ Conduct Cyber Hunting Exercises: Conduct operational threat hunting exercises to find incidents occurring within your environment. This allows for more proactive incident response.</li> <li>✓ Assess Your Threat Detection Capability: Assess your current threat detection capability and update risk assessment and improvement programs.</li> </ul>
3	In order to successfully address security events, what should be done during the detection and reporting phase?	<ul style="list-style-type: none"> <li>✓ Monitor: Monitor security events in your environment using firewalls, intrusion prevention systems, and data loss prevention.</li> <li>✓ Detect: Detect potential security incidents by correlating alerts within a SIEM solution.</li> <li>✓ Alert: Analysts create an incident ticket, document initial findings, and assign an initial incident classification.</li> <li>✓ Report: Your reporting process should include accommodation for regulatory reporting escalations.</li> </ul>
4	Briefly explain triage and analysis as a phase.	The bulk of the effort in properly scoping and understanding the security incident takes place during this step. Resources should be utilized to collect data from tools and systems for further analysis and to identify indicators of compromise. Individuals should have in-depth skills and a detailed understanding of live system responses, digital forensics, memory analysis, and malware analysis.
5	Analysts should focus on which three primary areas?	<ul style="list-style-type: none"> <li>✓ Endpoint analysis</li> <li>✓ Binary analysis</li> <li>✓ Enterprise hunting</li> </ul>



6	Explain endpoint analysis.	<ul style="list-style-type: none"> <li>✓ Determine what tracks may have been left behind by the threat actor.</li> <li>✓ Gather the artifacts needed to build a timeline of activities.</li> <li>✓ Analyze a bit-for-bit copy of systems from a forensic perspective and capture RAM to parse through and identify key artifacts to determine what occurred on a device.</li> </ul>
7	Explain binary analysis.	<ul style="list-style-type: none"> <li>✓ Investigate malicious binaries or tools leveraged by the attacker and document the functionalities of those programs. This analysis is performed in two ways. <ul style="list-style-type: none"> <li>○ Behavioral Analysis: Execute the malicious program in a VM to monitor its behavior</li> <li>○ Static Analysis: Reverse engineer the malicious program to scope out the entire functionality.</li> </ul> </li> </ul>
8	Explain enterprise hunting.	<ul style="list-style-type: none"> <li>✓ Analyze existing systems and event log technologies to determine the scope of compromise.</li> <li>✓ Document all compromised accounts, machines, etc. so that effective containment and neutralization can be performed.</li> </ul>
9	Identify three points to consider during containment and neutralization.	<ul style="list-style-type: none"> <li>✓ Coordinated Shutdown: Once you have identified all systems within the environment that have been compromised by a threat actor, perform a coordinated shutdown of these devices. A notification must be sent to all IR team members to ensure proper timing.</li> <li>✓ Wipe and Rebuild: Wipe the infected devices and rebuild the operating system from the ground up. Change passwords of all compromised accounts.</li> <li>✓ Threat Mitigation Requests: If you have identified domains or IP addresses that are known to be leveraged by threat actors for command and control, issue threat mitigation requests to block the communication from all egress channels connected to these domains.</li> </ul>
10	Explain post-incident activity in detail.	<ul style="list-style-type: none"> <li>✓ Complete an Incident Report: Documenting the incident will help to improve the incident response plan and augment additional security measures to avoid such security incidents in the future.</li> <li>✓ Monitor Post-Incident: Closely monitor for activities post-incident since threat actors will re-appear again. We recommend a security log hawk analyzing SIEM data for any signs of indicators tripping that may have been associated with the prior incident.</li> <li>✓ Update Threat Intelligence: Update the organization's threat intelligence feeds.</li> <li>✓ Identify preventative measures: Create new security initiatives to prevent future incidents.</li> <li>✓ Gain Cross-Functional Buy-In: Coordinating across the organization is critical to the proper implementation of new security initiatives.</li> </ul>

11	Identify steps that should be taken to prevent an accident at construction site.	<ol style="list-style-type: none"> <li>1. Provide safety training for all employees</li> <li>2. Hold frequent crew safety meetings</li> <li>3. Utilize protective clothing and gear</li> <li>4. Keep the workspace clean</li> <li>5. Maintain the equipment and tools</li> <li>6. Prevent falls</li> <li>7. Recognize the hazards and make a plan</li> <li>8. Be careful with vehicles</li> <li>9. Use equipment in the manner prescribed</li> <li>10. Follow OSHA guidelines and report any dangerous working conditions</li> </ol>
12	Explain how to provide safety training for all employees.	Employers should educate employees on all workplace safety standards and the hazards that they may face while on the job. Workers need to review the health and safety policies for each job they are called to do. The written safety policy should include procedure and the name and location of a trained first aid responder. Employees should not operate any equipment they are not qualified or trained to use.
13	Explain how to hold frequent crew safety meetings.	At some workplaces these meetings should be held daily, for example, if high-risk work is being done. Employees should be reminded to stay focused and relevant issues should be addressed. Real-life factual and job specific safety information tends to be more motivating for workers.
14	Explain how to utilize protective clothing and gear.	Workers should always wear the recommended safety equipment for their jobs. This may be a hard hat, high-visibility clothing, goggles, gloves, steel-toed shoes, or a protective suit. In the summer, outdoor workers need wide brim hard hats, nape protectors, and long sleeve-lightweight shirts to protect them from the sun's rays.
15	Explain how to keep the workspace clean.	Keeping work areas clean and free of <a href="#">debris</a> will lessen the chances of construction worker injuries and help prevent worksite accidents such as slips, trips, and falls. Employees should store tools and materials when finished with a job. Walkways should be kept clear of debris to prevent accidents that include slips and falls.
16	Explain how to maintain the equipment and tools.	Before using a piece of equipment or machinery, workers must ensure it is in proper working order. Tools and machinery should be kept on a regular inspection schedule. Workers have been known to get trapped in or under heavy equipment that was not working properly. Broken parts and malfunctioning gear can also cause serious injuries and deaths.
17	Explain how to prevent falls.	Falls are the leading cause of fatalities in the construction industry. It is important that workers are protected from falls on the job. The installation of fall protection systems can protect construction workers. These systems should consist of such items as guardrails, toe boards, screens, canopy structures or nets. <a href="#">Scaffolding</a> can prevent falls, but must be installed properly to make sure it is constructed well enough to hold the intended weight load. After it is put up, scaffolding must be inspected regularly.

18	Explain how to recognize the hazards and make a plan.	Before any project starts, the site should be inspected for any unusual hazards. A risk assessment can protect workers' health and safety. After completing the risk assessment, a list of preventive measures should be made and implemented. It is important to ensure that all workers receive appropriate information, education, and training.
19	Explain how to be careful with vehicles.	Many fatal accidents on work sites involve vehicles. Defensive driving, parking and backing should be practiced.
20	Explain how to use equipment in the manner prescribed.	If construction tools or equipment is used in ways for which it is not designed, the manufacturer's built in safety features can no longer be relied on. Misusing equipment may also damage the equipment and cause employee injuries. The equipment itself should meet OSHA standards.
21	Explain how to Follow OSHA guidelines and report any dangerous working conditions.	Employers and employees who cut corners on the procedures and rules of OSHA increase the risks for construction site injuries. Any incidents or violations of OSHA regulations should be recorded and reported for the safety of all involved.
22	What are some benefits that come from first aid in the workplace?	<ul style="list-style-type: none"> <li>✓ saving lives</li> <li>✓ preventing permanent disablement</li> <li>✓ providing immediate support to the injured person</li> <li>✓ improving safety awareness and preventing injury and illness in the workplace</li> <li>✓ assist in the early return to work and rehabilitation</li> </ul>
23	First Aid officers are responsible for what?	<ul style="list-style-type: none"> <li>✓ providing first aid to people who are injured or ill in the workplace</li> <li>✓ maintaining first aid kits after utilisation in a medical emergency</li> <li>✓ recording treatments and reporting treatment and incidents</li> <li>✓ maintaining a current first aid qualification</li> <li>✓ participating in refresher training and competency development activities</li> </ul>
24	Briefly explain the role of a first aid officer.	<ul style="list-style-type: none"> <li>✓ the emergency treatment of injuries and illness</li> <li>✓ arranging prompt and appropriate referral of casualties to medical aid if required</li> <li>✓ coordinate emergency services response if required</li> <li>✓ recording treatments and reporting incidents</li> <li>✓ the maintenance of first aid equipment, and keeping clean, checking and restocking first aid kits if utilized</li> </ul>
25	What is the DRS ABCD of first aid?	<ul style="list-style-type: none"> <li>✓ Danger</li> <li>✓ Response</li> <li>✓ Send for help after response</li> <li>✓ Airway</li> <li>✓ Breathing</li> <li>✓ CPR (Start CPR, 30 chest compressions to 2 rescue breaths)</li> <li>✓ Defibrillation</li> </ul>

## 2. PT=Practical Test

#	Questions	Answers
1	Student Assignments	Students need to undertake assignments related to applying accident-emergency procedures, 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"> <li>✓ Respond to the incident</li> <li>✓ Control and assist at accident or emergency site</li> <li>✓ Finalize accident - emergency process and complete records</li> </ul>
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"> <li>✓ Respond to the incident</li> <li>✓ Control and assist at accident or emergency site</li> <li>✓ Finalize accident - emergency process and complete records</li> </ul>
4	Demonstrate how to prevent an accident at a construction site	The student is expected to follow the correct step-by step process to preventing an accident at a construction site. The elements which should be assessed are: <ul style="list-style-type: none"> <li>✓ Provide safety training for all employees</li> <li>✓ Hold frequent crew safety meetings</li> <li>✓ Utilize protective clothing and gear</li> <li>✓ Keep the workspace clean</li> <li>✓ Maintain the equipment and tools</li> <li>✓ Prevent falls</li> <li>✓ Recognize the hazards and make a plan</li> <li>✓ Be careful with vehicles</li> <li>✓ Use equipment in the manner prescribed</li> <li>✓ Follow OSHA guidelines and report any dangerous working conditions</li> </ul>

### 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"> <li>✓ Respond to the incident</li> <li>✓ Control and assist at accident or emergency site</li> <li>✓ Finalize accident - emergency process and complete records</li> </ul>

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 applying accident emergency procedures, including responding to an incident, controlling and assisting at an accident or emergency site, finalizing accident-emergency processes, and completing records, reports and other required documentation  Review the assignment reports carefully to ensure students' performance related to the elements of competencies are evaluated and judged.
4	Demonstrate how to assist an injured person	As the students attend the practical test to assess their skill in assisting an injured person, make sure the student use the proper techniques and the information he shared is accurate.

#### 4. OQ=Oral Questioning

#	Questions	Answers
1	Respond to the incident	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ Response to the incident or accident is in accordance with workplace emergency procedures and relevant regulatory requirements</li> <li>✓ Details of the cause(s) and effects of the incident are identified and reported</li> <li>✓ Assistance requirements for accidents and emergencies are clarified and reported immediately to the appropriate parties</li> <li>✓ Requests for assistance are made to relevant personnel and emergency services</li> </ul>
2	Control and assist at accident or emergency site	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ Site is controlled and protected until the arrival of authorized personnel</li> <li>✓ Assistance is provided to injured persons, within the limitations of duty of care and workplace procedures</li> <li>✓ Relevant authorities at the site are cooperated with and assisted within workplace policies</li> </ul>
3	Finalize accident - emergency process and complete records	Make sure the students answer questions related to the following areas <ul style="list-style-type: none"> <li>✓ Relevant information is exchanged in accordance with state/territory law and workplace procedures</li> <li>✓ Documentation and reports are completed and processed in accordance with workplace and relevant regulatory requirements</li> </ul>

## 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>



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