Competency Standards for Caribbean Vocational Qualifications (CVQ)

CCMEM10702 Level I in Mechanical Maintenance

Unit Number	Unit Title	Mandatory /Elective	Hours
MEMCOR0131A	Undertake interactive workplace communication	Mandatory	20
MEMCOR0141A	Follow principles of Occupational Health and Safety (OH&S) in work environment	Mandatory	20
MEMCOR0161A	Plan to undertake a routine task	Mandatory	10
MEMCOR0171A	Use graduated measuring devices	Mandatory	10
MEMCOR0191A	Use hand tools	Mandatory	5
MEMCOR0051A	Perform related computations – (basic)	Mandatory	20
MEMCOR0081A	Mark off/out (general engineering)	Mandatory	10
MEMCOR0091A	Draw and interpret sketches and simple drawings	Mandatory	20
MEMCOR0111A	Use power tools	Mandatory	15
MEMFAB0041A	Carry out mechanical cutting operations – (basic)	Mandatory	10
MEMMPO0081A	Use workshop machines for basic operations	Mandatory	20
MEMCOR0121A	Classify engineering materials – (basic)	Mandatory	30
MEMMAH0081A	Perform housekeeping duties	Mandatory	10
MEMMAH0071A	Perform manual handling and lifting	Mandatory	5
MEMSUF0061A	Prepare for the application of protective coatings	Mandatory	5
MEMFAB0071A	Undertake fabrication, forming, bending and shaping	Elective	40
MEMMRD0041A	Remove/install standard mechanical seals	Elective	20
MEMMRD0061A	Remove and replace basic pneumatic system components	Elective	40
MEMMRD0071A	Remove and replace basic hydraulic system components	Elective	40
MEMMPO0011A	Perform daily operational maintenance of machines/equipment	Elective	20
MEMMRD0081A	Remove dismantle, assemble and replace basic engineering components	Elective	50
MEMMPO0021A	Perform general machining operations	Elective	60
MEMFAB0141A	Develop geometric shapes - (basic)	Elective	20
MEMFAB0061A	Perform manual heating and thermal cutting	Elective	20
MEMFAB0051A	Perform brazing and/or silver soldering	Elective	20
MEMFAB0151A	Prepare for oxyacetylene/metal arc welding processes	Elective	20
MEMFAB0121A	Perform basic welding using oxyacetylene welding process (OAW) - fuel gas welding	Elective	50

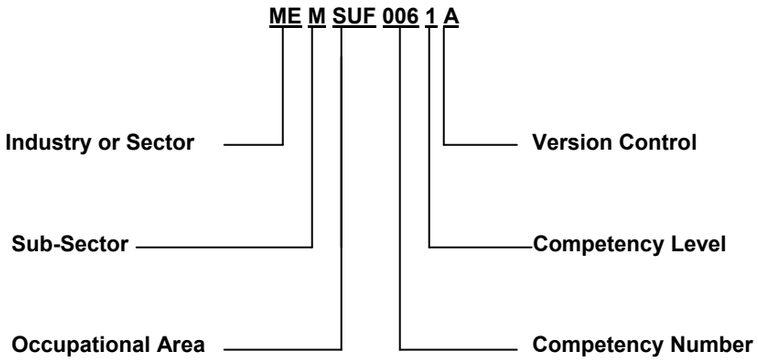
	Unit Title	Core/ Elective	Hours
MEMFAB0111A	Perform basic welding using manual metal arc welding process (MMAW)	Elective	50
MEMCOR0071A	Use electrical/electronic measuring devices	Elective	10
MEMMRD0101A	Evacuate and dehydrate refrigeration systems	Elective	40
MEMMRD0111A	Carry out routine servicing of coils, filters and room air conditioners	Elective	40
MEMINS0061A	Prepare for piping and tubing installation	Elective	20
MEMASY0071A	Assemble pipes and fittings for clients	Elective	40
MEMINS0041A	Install & maintain piping & tubing	Elective	40
ITICOR0011A	Carry out data entry and retrieval procedures	Elective	40
MEMCOR0101A	Prepare basic engineering drawing	Elective	30
MEMINS0182A	Install valves, regulators and metering devices	Elective	15
MEMINS0232A	Prepare material and locations for installing drains and waste systems	Elective	15
MEMMRD0072A	Shut down/isolate machine/equipment	Elective	20
BSBSBM0012A	Craft personal entrepreneurial strategy	Elective	50

To be awarded this Caribbean Vocational Qualification (CVQ) all core competency standards must be achieved. Electives achieved with the qualification will be awarded unit statement of competency.

The nominal training hours are a guide for planning the delivery of Training Programmes.

Legend to Unit Code

Example: MEMSUF0061A



KEY: **Man – Mandatory; FAB – Fabrication; MAH – Machine Handling; INS – Installation; ASY – Assembly; MPO – Machine & Process Operations; SUF - Surface Finishing; MRD – Maintenance Repairs & Diagnostic; BSB Business Services (Industry); SBM – Small Business Management; ITI - Information Technology (Industry); MEM – Metal Engineering (Maintenance)**

MEMCOR0131A: Undertake interactive workplace communication

Competency Descriptor: This unit deals with the skills and knowledge required to effectively undertake interactive communication at the workplace, and applies to all individuals working in the metal, engineering and maintenance industry

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Communicate information about tasks, processes, events or skills	1.1 Information about tasks, processes, events or skills is communicated.
	1.2 Multiple operations involving several topics/areas are communicated.
	1.3 Listening is undertaken without continuous interruptions of the speaker.
	1.4 Questions are used to gain extra information.
	1.5 Correct sources of information are identified.
	1.6 Information is selected and sequenced appropriately.
	1.7 Verbal and written reporting is undertaken where required.
	1.8 Communication is demonstrated in both familiar and unfamiliar situations and to familiar and unfamiliar individuals and groups.
2. Take part in group discussion to achieve appropriate work outcomes	2.1 Responses sought and provided to others in the group.
	2.2 Constructive contributions are made in terms of the production process involved.
	2.3 Goals and aims are communicated.

RANGE STATEMENT

This unit covers competencies needed for situations where employees must collectively undertake a task eg: three or four assemblers co-operating to assemble a product, a trades person who has to attend a service call, or a group of process workers who undertake a similar task in close proximity to each other.

Techniques that could be used as the subject of communication includes but is not limited to:

- sketches
- drawings
- charts and maps
- telephone
- production schedules
- written machine or job instructions;
- client instructions
- face to face
- signage
- memos
- work schedules/work bulletins

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of methods of communication relating to instructions, information sources and meeting procedures listed within the range statement relative to the work orientation.

(1) Critical Aspects of Evidence

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or elective competencies. The communication tasks may be related to any aspect of the job, interacting with team members, receiving instructions, reporting and any other activity that requires communication with individuals or groups.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to undertake interactive workplace communication
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- basic level of ability in speaking
- basic level in reading
- basic level in writing English
- basic numeracy
- work place safety requirements
- the use of work schedules, charts, work bulletins and memos

Skills
The ability to:

- work safely to instructions
- convey information in simple English to invoke correct actions

Basic numeracy means the ability to perform simple arithmetic using whole numbers applying the four basic rules of addition, subtraction, multiplication and division. The unit however does not refer to competence in English but in communication. English language ability should be professionally assessed.

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The communication Activities undertaken should be consistent with the individual's field of work and be based on Interaction with others related to workplace tasks and procedures, tools, equipment, materials and Documentation relevant to that field of work. The competencies covered by this unit should be demonstrated by an individual working alone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0141A: Follow principles of Occupational Health and Safety (OH&S) in work environment

Competency Descriptor: This unit deals with the skills and knowledge required to effectively perform work activities to conform to Occupational Health and Safety requirements, and applies to all individuals working in the metal, engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Follow safe work practices	1.1 Work is carried out safely and in accordance with company policy and company procedures and industry requirements.
	1.2 Housekeeping is undertaken in accordance with company procedures.
	1.3 Responsibilities and duties of employees are understood and demonstrated in day-to-day actions.
	1.4 Personal protective equipment is worn and stored according to company procedures.
	1.5 All equipment and safety devices are used according to legislative requirements and company/manufacturer's procedures/instructions.
	1.6 Safety signs/symbols are identified and followed as per instruction.
	1.7 All manual handling is carried out in accordance with Industry requirements, company procedures and National Occupational Health & Safety guidelines.
	1.8 Occupational Health & Safety Commission guidelines demonstrated.
2. Report workplace hazards	2.1 Workplace hazards identified during the course of work are reported to appropriate person according to standard operating procedures/factory act.

3.	Follow emergency procedures	3.1	Means of contacting the appropriate personnel and emergency services in the event of an accident demonstrated.
		3.2	Emergency and evacuation procedure understood and carried out when required.

RANGE STATEMENT

This Occupational Health and Safety (OHS) unit applies to safe working practices as applied to all metal and engineering workplaces. Competencies to be demonstrated must be associated with performance of duties and use of specialist skills. This unit and these standards do not cover the skills of emergency teams such as fire fighting, first aid officer etc

Emergency procedures may include but not limited to the isolation of the following equipment as appropriate.

- electrical,
- mechanical
- hydraulic
- pneumatic
- emergency
- steam and water
- oxy fuel

Quality Assurance requirements may include:

- working environment/fellow workers
- adverse weather conditions
- protection of work personnel
- protection of public

Personal protective equipment may include but is not limited to:

- overalls, safety glasses/goggles, hard hat cap
- dust masks/respirator, gum boots
- ear plugs/muffs

Emergency procedures include:

- fire fighting
- medical and first aid
- evacuation

Ladders and work platforms include:

- extension ladders
- step ladders
- trestle ladders
- simple work platforms

Power connections include:

- ELCB systems
- isolation transformer (safe-T-pack)
- power pole/B4
- switch board area

Safety responsibilities apply to:

- personal protection
- safe interactive work practices (duty of care)
- Occupational Health and Safety (OHS) regulations
- National Environment and Planning agency (NEPA) regulations

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively carrying out safe work practices within the range of variables statement relevant to the work orientation

(1) Critical Aspects of Evidence

It is essential that competence is observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- demonstrate application of organizational policies and procedures including Quality Assurance requirements where applicable.
- carry out correct procedures prior to and during work activities.
- safe and effective operational use of tools, plant and equipment.
- carry out appropriate applications in accordance with regulatory and legislative requirements

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- basic level of ability in speaking
- basic level in reading & writing English
- workplace and equipment safety requirements
- material handling requirements
- relevant acts, regulations and codes of practice
- company policy

Skills
The ability to:

- work safely to instructions
- use tools and equipment safely
- select and use material equipment and tools to standards
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. Aspects of this unit will need to be assessed in a work situation.

The context in which the OH & S principles are applied should be consistent with the individual's field of work. The competencies covered by this unit would be demonstrated by an individual working lone or as part of a team. Assessment should be conducted in an environment that the individual is familiar with.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0161A: Plan to undertake a routine task

Competency Descriptor: This unit deals with the skills and knowledge required to effectively plan to undertake a routine task and applies to all individuals working in the metal, engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Identify task requirements	1.1	Instructions as to procedures are obtained, understood and where necessary clarified.
		1.2	Relevant specifications for task outcomes are obtained, understood and where necessary clarified.
		1.3	Task outcomes are identified.
		1.4	Task requirements such as completion time and quality measures are identified.
2.	Plan steps required to complete task	2.1	Based on instructions and specifications provided, the individual steps or activities required to undertake the task are understood and where necessary clarified.
		2.2	Sequence of activities required to be completed is identified in plan.
		2.3	Planned steps and outcome are checked to ensure conformity with instructions and relevant specifications.
3.	Review plan	3.1	Outcomes are identified and compared with (planned) objectives, task instructions, specifications and task requirements.
		3.2	If necessary, plan is revised to better meet objectives and task requirements.

RANGE STATEMENT

This unit applies to the activities related to planning to undertake a routine task. The task and associated planning activity are carried out under supervision. The plan may or may not be documented. The task involves one or more steps or functions carried out routinely on a regular basis. The planning activity does not require the exercise of judgement as to priorities or time limitations, it requires that precise information provided in the instructions be accurately followed, steps in the process be completed in the appropriate sequence and that the time limits specified are met.

Instructions may include but not limited to:

- standard operation sheets
- clear specifications and requirements
- quality and time allowances
- standard operating procedures

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of planning activities relating to instructions, information sources and meeting procedures listed within the range statement relative to the work orientation

(1) Critical Aspects of Evidence

This unit should be assessed in conjunction with other specialisation or core units and not in isolation. The assessment should be linked with performance of normal workplace activities where the competency covered by this unit is demonstrated concurrently with other core or elective competencies. The assessment of this competency may be associated with the assessment of core or elective units that require planning for undertaking a routine task in the individual's field of work.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to plan to undertake a routine task
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- basic level of ability in speaking
- basic level in reading
- basic level in writing English
- basic numeracy
- task requirements
- work place operating procedures
- the use of work schedules, charts, work bulletins and memos

Skills
The ability to:

- work safely to instructions
- convey information in simple English to invoke correct actions
- apply quality procedures
- read and interpret simple drawings, and specifications
- plan a routine task
- undertake a routine task

Basic numeracy means the ability to perform simple arithmetic using whole numbers applying the four basic rules of addition, subtraction, multiplication and division. The unit however does not refer to competence in English but in communication. English language ability should be professionally assessed

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The communication Activities undertaken should be consistent with the individual's field of work and be based on Interaction with others related to workplace tasks and procedures, tools, equipment, materials and Documentation relevant to that field of work. The competencies covered by this unit would be Demonstrated by an individual working alone or as part of a team. Assessment should be Conducted in an environment that the individual is familiar with.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
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Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0171A: Use graduated measuring devices

Competency Descriptor: This unit deals with the skills and knowledge required to effectively measure with graduated devices, and applies to all individuals working in the metal, engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Use a range of graduated devices to measure/determine dimensions or variables	1.1 Selected appropriate device or equipment to achieve required outcome.
	1.2 Used correct and appropriate measuring technique.
	1.3 Measured accurately to finest graduation of instrument. As appropriate to field or area.
2. Maintain graduated devices	2.1 Carried out routine care and storage of devices to manufacturer's specification or standard operating procedure
	2.2 Checked and made routine adjustments to devices eg "zeroing".

RANGE STATEMENT

This unit applies to work undertaken in field, workstation and workshops. Work can be undertaken under supervision or part of team environment. This unit covers measurement skills requiring straightforward application of the measuring device and may utilise the full range of graduations of measuring device.

Measuring devices may include but not limited to:

- verniers,
- feeler gauges
- pressure gauges
- squares
- levels
- micrometers,
- dial indicators
- thermometers
- measuring tapes
- protractors

Measurements undertaken may include but not limited to:

- length /width/depth
- roundness
- squareness
- flatness angle
- angles
- clearances
- measurements that can be read off antilog, digital or other graduated device
- plumb ness

Electrical/electronic devices used are those not requiring the connection or disconnection of circuitry. Measurements may include metric and imperial measurement. All measurements undertaken to standard operating procedures. Adjustment of measuring devices is through external means and includes zero and linear adjustment.

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use graduated measuring devices in accordance with the range listed in the range of variables statement, relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling recording and reporting associated with the use of graduated measuring devices or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- Demonstrate safe working practices at all times
- Demonstrate the ability to use graduated measuring devices
- Communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- Take responsibility for the quality of their own work
- Perform all tasks to specification
- Use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(2) Pre-requisite Relationship of Units

For straightforward use of comparison or basic measuring devices Unit MEMCOR0041A (Use comparison and basic measuring devices) should be accessed.

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- comparison devices
- comparison measurements
- comparative measurements
- electrical/electronic devices
- basic measuring devices
- reading
- writing English
- basic numeracy

Skills
The ability to:

- follow safely to instructions
- use power tools and hand tools
- use measuring devices
- adjust measurements
- handle materials
- select material
- apply quality assurance

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0191A: Use hand tools

Competency Descriptor: This unit deals with skills and knowledge required to competently select and use appropriate hand tools of the metal engineering and maintenance trades, and applies to all individuals in the industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Use hand tools	1.1 Selected appropriate hand tools according to the task requirements.
	1.2 Hand tools used to produce desired outcomes to job specifications which may include finish, tension, size or shape.
	1.3 Adhered to all safety requirements before, during and after use.
	1.4 Unsafe or faulty tools identified and marked for repair according to designated procedures before, during and after use.
	1.5 Carried out routine maintenance of tools, including hand sharpening according to standard operational procedures, principles and techniques.
	1.6 Hand tools are stored safely in appropriate location according to standard operational procedures and manufacturer's recommendations.

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures involving the use of various hand tools for applications, maintenance tasks and the finishing of items or components metallic and non-metallic material to size and shape using engineering principles, tools, equipment and procedures.

Hand tools may include but not limited to:

- hacksaws
- hammers
- punches
- screwdrivers
- sockets
- wrenches
- scrapers
- chisels
- gouges
- wood planes
- files of all cross-sectional shapes and types.

Applications may include hand tools used for

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- cleaning,
- lubricating,
- tightening
- simple tool repairs
- hand sharpening
- adjustments

EVIDENCE GUIDE

Competency is to be demonstrated by the safe and effective use of particular hand tools listed within the range of variables statement relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of hand tools or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to use hand tools
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

This unit should not be selected if the hand tool is dedicated to a single operation or machine and if only a machine specific/customised tool is used. For using power tools used for hand held operations see Unit MEMCOR0111A (Use power tools).

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements and OH&S guidelines
- work shop procedures
- technical applications
- hand tools and equipment
- materials
- materials handling whilst operating tools

Skills
The ability to:

- work safely to instructions
- apply appropriate hand-eye co-ordination in the use of tools
- handle/hold materials during operation of tools
- select appropriate tools for material usage
- communicate effectively
- use tools correctly

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

MEMCOR0051A: Perform related computations – (basic)

Competency Descriptor: This unit deals with the skills and knowledge required to perform basic computations and effectively carry out measurements of work to required tolerance, and applies to all individuals working in the metal engineering and maintenance industry.

Competency Field: Maintenance and metal fabrication

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Apply four basic rules of calculation	1.1 Simple calculations are performed using four basic rules, addition, subtraction, multiplication and division.
	1.2 Concepts are understood and simple calculations are performed involving length, perimeter, angles, area and volume.
2. Perform basic calculations involving fractions and decimals	2.1 Simple calculations are performed involving fractions and mixed numbers using the four basic rules.
	2.2 Simple calculations are performed involving decimal fractions and mixed numbers using the four basic rules.

RANGE STATEMENT

This unit applies to simple projects applicable to:

- metal fabrication
- mechanical maintenance
- electrical/electronic maintenance
- manufacturing

Calculations may be performed using:

- pen
- paper
- calculator
- protractor

Basic numeracy skills below those described in this unit are not covered in these standards and are assumed to be held on entry to the industry. Basic numeracy means the ability to:

- perform simple arithmetic using whole numbers
- apply the four basic rules of:
- addition
- subtraction
- multiplication
- division

Computations performed in an appropriate application for the industry in which the person is working. Skills may be demonstrated in relation to:

- measurement
- statistical application
- ratio and proportion
- estimation
- calculations with fractions and decimals
- interpretation of drawings
- interpretation of diagrams
- interpretation of mathematical statements and formulae.
- interpretation of numbers and arithmetic operations.

EVIDENCE GUIDE

Competency is to be demonstrated by the effective calculation of measurements and calculation of materials in accordance with range of variables statement relevant to the work orientation.

(1) Critical Aspects of Evidence

During assessment the individual will:

- take responsibility for the quality of their own work
- perform computations in accordance with standard principles
- apply the four basic rules of calculations
- performs basic calculations involving fractions and decimals
- perform computations accurately
- use accepted motor vehicle repair techniques, practices, processes and workplace procedures.

All must be associated with the calculations and computations being performed or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- drawings and specifications
- basic operations in simple geometry,
- measurement and calculations
- costing relative to the automotive trade processes
- numbers and arithmetic operations
- calculations with fractions and decimals
- estimation and measurement
- percentages (some applications)
- ratio and proportion (some applications)
- basic statistics (data, tables, graphs and sales)
- mathematical statements and formulae

Skills
The ability to:

- read and interpret drawings
- measure and calculate manually
- record measurements
- operate electronic calculating devices
- communicate effectively

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of installation activities to which applicant has contributed, or worked on
- training courses on basic math
- examples of authenticated assessments and/or assignments from formal education courses
- self assessment reports
- simulation

Assessor must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

All tasks involved must be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0081A: Mark off/out (general engineering)

Competency Descriptor: This unit deals with the skills and knowledge required to effectively transfer dimensions from engineering drawings, prints or plans and applies to individuals working in the metal, engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Determine job requirements	1.1	Drawings, job instructions and specifications are interpreted and understood.
		1.2	Appropriate methods and sequencing are selected and are consistent with proposed fabricating process.
2.	Transfer dimensions	2.1	All marking off/out is carried out to specifications using appropriate tools and equipment.
		2.2	Datum points are correctly established.
		2.3	Dimensions transferred are correct and appropriate
3.	Make templates	3.1	Appropriate template materials are selected.
		3.2	Templates are produced to specifications and appropriate to desired use.
		3.3	Correct storage procedures are followed.

RANGE STATEMENT

This unit applies to the marking off/out techniques used for the transfer of dimensions from engineering drawings, prints or plans. Work is undertaken under supervision using predetermined standards of quality, safety and workshop procedures. The task may be performed in the workshop or on site. Marking off/out is undertaken using appropriate tools and equipment; templates and are produced as required. Marking off/out techniques may apply to a range of materials and shapes.

Storage procedures include labelling and identification to standard operating procedures

Marking out covers but not limited to:

- engineering components
- jigs and fixtures
- castings
- templates
- dies and tooling

Equipment may include but not limited to:

- marking out tables
- surface tables
- rotary tables
- dividing heads etc.
- vee blocks
- cylinder squares
- sine bars and the like
- vernier height gauges
- protractors
- straight edge
- set squares
- marking out tools

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of the marking off/out techniques used for the transfer of dimensions in accordance with the range listed in the range of variables statement, relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the marking off/out of components or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to measure and calculate manually
- demonstrate the ability to transfer and record measurements accurately
- demonstrate the ability to mark off/out accurately
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0091A Draw and Interpret sketches and simple drawings

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- tools
- apparatus
- drawing interpretation
- basic numeracy
- marking off/out techniques
- materials relevant to the engineering process
- basic operations in simple geometry measurement and calculations

Skills
The ability to:

- work safely to instructions
- use marking out tools and equipment
- handle materials
- select tools/equipment
- select material
- transfer measurements
- apply quality assurance
- read and interpret drawings and specifications
- measure and calculate manually
- record measurement

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0091A: Draw and interpret sketches and simple drawings

Competency Descriptor: This unit deals with the skills and knowledge required to effectively draw and interpret sketches and simple drawings, and applies to all individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Prepare freehand sketch	1.1	Sketch is correctly and appropriately drawn.
		1.2	Sketch depicted object or part.
		1.3	Dimensions are obtained correctly.
		1.4	Dimensions are shown clearly.
		1.5	Instructions are shown clearly.
		1.6	Base line or datum point is indicated.
2.	Interpret details from freehand sketch	2.1	Components, assemblies or objects are recognised.
		2.2	Dimensions identified are appropriate to field of employment.
		2.3	Instructions are identified and followed.
		2.4	Material requirements are identified.
		2.5	Symbols are recognised in sketch.
3.	Select correct technical drawing	3.1	Drawing is checked and validated against job requirements or equipment.
		3.2	Drawing version is checked and validated.
4.	Identify drawing requirements	4.1	Requirements and purpose of drawing is determined from customer and/or work specification and associated documents.

		4.2	Identified and collected all data necessary to produce the drawing
		4.3	Drawing requirements are confirmed with relevant personnel and timeframes for completion established.
5.	Prepare or make changes to engineering drawing	5.1	Selected appropriate drafting equipment
		5.2	Applied drafting principles to produce a drawing that is consistent with standard operating procedures within the company.
		5.3	All work is undertaken to prescribed procedure.
		5.4	Completed drawing is approved in accordance with standard operating procedures.

RANGE STATEMENT

Technical drawing interpretation is applied to any of the full range of metal, engineering and maintenance disciplines.

Technical drawings may utilise any of the following techniques:

- perspective
- exploded views
- hidden view

Drawings are to be provided to Engineering Standards and/or their equivalents from the full range of engineering disciplines.

Standard engineering symbols or equivalent and are to be recognised in the field of employment.

Drawing instruments and supplies:

- drafting kit/instruments
- blue prints
- drawings/modules/photographs

Measurement systems:

- inch/foot system
- metric(SI) system

Alphabet of line:

- object line
- hidden line
- centre line
- section line
- dimension
- extension line
- cutting line
- short break line
- phantom line

Geometric construction to include:

- circles
- regular polygons with four, seven and eight sides
- pentagon inscribed within measured circle
- ellipse
- triangles with specified angles
- arcs thru three points tangent to two
- circles

Multi-view (orthographic 2-D) drawings:

full scale (1:1) orthographic 3-view drawing using third angle projection with top, front and right side view – show all hidden features and centrelines

Pictorial (3-D) drawing to include:

- isometric corner with left and right side lines each 30 degrees up from horizontal and third line at a vertical, with all three lines joining in a common intersection
- full scale (1:1) basic isometric drawing

Dimension reading:

- dimensioning styles and methods: co-ordinate, linear/datum
- dimensioning 2-D drawing
- dimensioning complex shapes: spheres, cylinders, tapers, pyramids

EVIDENCE GUIDE

Competency is to be demonstrated by developing and effectively reading and interpreting simple drawings and sketches to locate or identify specified features or specifications in accordance with the performance criteria and the range listed within the range statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the drawing and interpretation of exercise of the sketches or other units requiring the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate the ability to identify, understand, read and interpret various types of technical drawings
- demonstrate the ability to identify alphabet of lines, scales, lettering, dimensions, symbols, abbreviations and key features
- demonstrate the ability to identify title panel and reference date of drawings
- take responsibility for the quality of their own work;
- perform all tasks in accordance with standard drafting procedures;
- use accepted engineering techniques, practices, processes and workplace procedures.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- types and use of drawing instruments and supplies
- identification of alphabet of lines, line type variation, order of usage and application on drawings
- types of scale and proportion and how they are used for measurement
- symbols, dimensions and terminology types of drawings and their applications

Skills
The ability to:

- estimate measurements
- read and interpret simple drawings
- measure accurately
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

(6) Context of Assessment

Competency should be assessed in a classroom environment in accordance with work practices and industry procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0111A: Use power tools

Competency Descriptor: This unit deals with skills and knowledge required to competently select and use appropriate power tools for hand held operations of the metal engineering and maintenance trades, and applies to all individuals in the industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Use power tools	1.1 Appropriate power tools are selected according to the task requirements.
	1.2 Power tools are used following a determined sequence of operations to produce desired outcomes.
	1.3 All safety requirements are adhered to before, during and after use.
	1.4 Unsafe or faulty tools are identified and marked for repair according to designated procedures.
	1.5 Operational maintenance of tools is undertaken according to standard workplace procedures, principles and techniques.
	1.6 Power tools are stored safely in appropriate location according to standard workshop procedure and manufacturer's recommendations.

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures involving the use of various power tools for applications, maintenance tasks and the finishing of items or components metallic and non-metallic material to size and shape using engineering principles, tools, equipment and procedures to company and regulatory requirements.

Power tools may include but not limited to electric or pneumatic:

- drills
- grinders
- jigsaws
- nibblers
- cutting saws
- threading machine
- sanders
- planers
- routers
- pedestal drills
- pedestal grinders

Applications may include power tools used for

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- threading

Operations may include:

- clamping
- aligning
- adjusting
- cleaning,
- lubricating,
- tightening
- simple tool repairs
- hand sharpening
- adjustments

Outcomes to job specifications may include

- finish
- size
- shape

EVIDENCE GUIDE

Competency is to be demonstrated by the safe and effective use of particular power tools listed within the range of variables statement relevant to the work orientation

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the use of power tools in hand held operations or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to select and use appropriate power tools for hand held operations
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

This unit should not be selected if the power tools used are dedicated to an operation or machine that is nut-runner, air drill, power driver etc. For using hand tools see Unit MEMCOR0191A (Use hand tools).

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements and OH&S legislation
- work shop procedures
- engineering principles
- technical applications
- power tools and equipment
- materials
- materials handling whilst operating tools

Skills
The ability to:

- work safely to instructions
- apply appropriate hand-eye co-ordination in the use of tools
- handle/hold materials during operation of tools
- select appropriate tools for material usage
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team.

The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0041A: Carry out mechanical cutting operations – (basic)

Competency Descriptor: This unit deals with the skills and knowledge required to effectively carry out mechanical cutting as applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Determine job requirements	1.1	Job specification and requirements are determined from job sheets and/or instructions.
		1.2	Appropriate method/machine is selected to meet specifications.
		1.3	Machine is loaded and adjusted appropriately for operation and is consistent with standard operating procedures.
2.	Select/set up machine tooling	2.1	Selected most appropriate tooling.
		2.2	Installed tooling correctly using standard operating procedures.
		2.3	Machine is set up and adjusted using standard operating.
3.	Operate mechanical cutting machine	3.1	Appropriate stops and guards are set and adjusted as required.
		3.2	Material is secured and correctly positioned using measuring equipment as necessary.
		3.3	Machine is started and stopped safely to standard operating procedures.
		3.4	Machine is operated to cut/hole material to specifications using standard operating procedures.
		3.5	Lubricant used as required.
		3.6	Appropriate safety precautions are taken.
4.	Check material for conformance to specification	4.1	Material is checked against specification.
		4.2	Machine and/or tooling is adjusted as required

4.3 Material is cut and/or holed to within workplace tolerances.

4.4 Material used in most economical way.

4.4 Codes and standards are observed.

RANGE STATEMENT

This unit may cover the operation of a number of the following activities:

- sawing
- shearing
- cropping
- holing /boring

Work is undertaken under supervision or as part of a team environment to predetermined:

- standards of quality
- safety
- workshop procedure.

Materials may include:

- ferrous metals
- non-ferrous metals
- non-metallic products

This unit includes the set up and operation of a range of:

- mechanical cutting equipment
- holing /holing equipment

Examples of machines that could be covered include:

- guillotines
- croppers
- cold saws
- band saws
- automatic saws

Typical applications of this unit may include cutting for:

- manufacture
- production
- cutting of materials selected from stores in a maintenance environment
- fabrication

EVIDENCE GUIDE

Competency is to be demonstrated safely and effectively when cutting material in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to setting up mechanical cutting equipment and during the cutting process
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in setting up cutting equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective cutting to produce designed cut material

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the mechanical cutting of materials or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

This unit does not cover hand or hand held power tools used for cutting purposes eg: circular saws, nibblers and side grinder. These skills are covered by other units; see Unit MEMCOR0191A (Use hand tools) and Unit MEMCOR0111A (Use power tools).

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- cutting equipment
- cutting processes operations or activities
- hand tools and equipment
- materials relative to cutting processes
- materials preparation
- manual handling
- measurement
- drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- interpret relative drawings and instructions
- use power tools and hand tools
- select material
- measure relative to cutting processes
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMPO0081A: Use workshop machines for basic operations

Competency Descriptor: This unit deals with the skills and knowledge required to effectively use workshop machines for basic operations and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Determine job requirements	1.1	Job requirements are interpreted.
		1.2	Appropriate machine is selected to meet requirements.
2.	Set up machine	2.1	Tools are selected where appropriate.
		2.2	Cutting tools are sharpened as required.
		2.3	Tools are correctly installed using standard operating procedures.
		2.4	Appropriate guards are set and adjusted as required.
3.	Operate machine	3.1	Material to be machined is positioned and secured
		3.2	Machine is operated appropriately to suit job and material requirements.
4.	Check finished component	4.1	Machined component are checked against requirements and predetermined finish.

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures. This unit covers basic machining in a maintenance or jobbing environment. The machines include but are not limited to lathe, radial arm drill, etc., and covers the sharpening of tools as required.

Instruments:

- tapes
- ruler
- vernier
- callipers
-
- feeler gauges
- slip gauges
- range of micrometer instruments

Working hold devices including:

- jigs/fixtures
- vices
- chuck/collets
- mounting direct to table,
- automatic or manual operation

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual metal arc welding all process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to perform basic machining processes efficiently.
- communicate information about tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Apply principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMC0R0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering)
- MEMCOR0191A Use hand tools

This unit is not to be selected when Units MEMMPO0021A (Perform general machining) or MEMMPO0061A (Operate and monitor machine/process) have already been selected. For hand held/power tools use MEMCOR0111A (Use power tools).

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S regulations
- metal properties and classification
- common machine setting/holding tools
- metal lathe machines (capstan, center or turret)
- basic machining techniques
- setting basic metal machines
- machining processes
- hand tools and equipment
- materials preparation
- manual handling and lifting
- measurement
- drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use basic machining equipment
- identify/select material/equipment
- identify/select machining processes
- handle material, tools and equipment
- measure relative to machining processes
- identify/select materials suitable for machining processes
- prepare materials relative to the machining process
- perform basic machining processes efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0121A: Classify engineering materials – (basic)

Competency Descriptor: This unit deals with skills and knowledge required to competently select and use appropriate metals for operations and procedures in the metal engineering and maintenance trades, and applies to individuals in the industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Distinguish between the characteristics of engineering materials	1.1	Identified the characteristics of engineering materials.
		1.2	Demonstrated knowledge of the effect external factors has on engineering metals.
2.	Distinguish between the characteristics of metals	2.1	Identified the characteristics of engineering metals.
		2.2	Compared the properties and characteristics of engineering metals.
		2.3	Demonstrated the ability to carry out testing methods for engineering metals.
		2.4	Demonstrated the ability to carry out heat treatment process.
3.	Identify and select engineering metals for specific applications	3.1	Identified common applications of engineering metals.
		3.2	Identified ferrous and non-ferrous metals according to specific requirements.

RANGE STATEMENT

This unit applies to the knowledge of and skills required to classify identify, select and use engineering materials for various procedures and operations in the engineering and maintenance field.

Materials may include both ferrous and non-ferrous metals, plastics ceramics and metal alloys

EVIDENCE GUIDE

Competency is to be demonstrated by classifying engineering in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, maintenance and fabrication associated with the use of materials in engineering operations or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to identify and compare the properties and characteristics of engineering metals
- demonstrate the ability to apply appropriate principles/techniques to identify materials
- demonstrate the ability to carry out specific heat treatment and testing procedures
- Take responsibility for the quality of their own work
- Perform all tasks in accordance with standard operating procedures

Use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR01311A Undertake interactive workplace communication
- MEMCOR0141A Follow principles of occupational Health and Safety (OH&S) in work place

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements and OH&S legislation
- properties and nature of materials
- properties of plastics and ceramics
- properties of metals
- heat treatment procedures
- material testing procedures
- engineering application of metals
- ferrous and non-ferrous metals

Skills
The ability to:

- work safely to instructions
- compare the properties and characteristics of engineering metals
- apply appropriate principles/techniques to identify materials
- select appropriate material for usage
- carry out specific heat treatment and testing procedures
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMAH0081A: Perform housekeeping duties

Competency Descriptor: This unit deals with the skills and knowledge required to effectively perform housekeeping duties. It applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Plan and prepare work	1.1	OH&S requirements associated with application tasks and workplace environment are recognized and adhered to.
		1.2	Appropriate personal protective equipment is selected, correctly fitted and used.
		1.3	Quality Assurance requirements associated with company's operations is recognized and adhered to.
		1.4	Tools and equipment for handling materials/goods, non-toxic waste is selected and is consistent with job requirements.
		1.5	Tools and equipment for handling materials/goods is checked for serviceability and any faults reported to supervisor.
2.	Correctly manual handle, sort and stack engineering /construction material	2.1	Common engineering materials is recognized and selected for sorting and stacking/stockpiling to supervisor's instructions and/or specifications.
		2.2	Handling characteristics of materials are identified and appropriate handling techniques applied.
		2.3	Specific handling requirements for hazardous materials are applied.
		2.4	Materials are stored, stacked/stockpiled and protected clear of traffic ways so they can be easily identified and retrieved
		2.5	Appropriate signage and barricades are erected where applicable in order to isolate stored materials from workplace traffic or access.
		2.6	Correct manual handling techniques are used.

3.	Prepare for mechanical handling of materials	3.1	Materials are stacked/banded for mechanical handling in accordance with type of material and plant/equipment to be used.
		3.2	Rigger is assisted with the loading, unloading, moving, locating and/or installing materials.
		3.3	Materials are safely handled with assistance of pallet trolley, forklift or hoist.
4.	Handle and remove waste safely	4.1	Waste materials are handled correctly and safely according to OH&S and requirements of regulatory authorities.
		4.2	Hazardous materials are identified for separate handling.
		4.3	Non-toxic materials are removed using correct procedures.
		4.4	Dust suppression procedures are used to minimise health risk to work personnel and others.
5.	Clean up	5.1	Tools and equipment are cleaned, maintained, and stored.
		5.2	Unused materials are safely stacked/stockpiled stored.
		5.3	Waste materials are disposed of safely.
		5.4	Site is cleaned and cleared of debris and unwanted material.

RANGE STATEMENT

Competency is to be demonstrated by the effective use of techniques relating to instructions, information sources and meeting procedures listed within the range statement relative to the work orientation.

Tools and equipment includes but is not limited to:

- Brooms
- hoses
- shovels
- rakes
- wet and dry industrial vacuum cleaners
- wheelbarrows
- pallet trolley
- materials hoists
- forklifts
- buckets

- Engineering materials include but are not limited to:

- bricks and concrete masonry
- mortar components – cement, coarse aggregate, sand
- timber
- structural steel sections/components
- concrete
- scaffolding components, pipe sections
- plywood and particle board
- metal sheeting
- steel reinforcement
- insulation
- glass
- paints and sealants
- plaster sheeting

Protection of stacked/stored materials may include:

- covering
- tying or banding
- barricades
- signs
- locked away (hazardous materials)

Dust suppression procedures may include:

- spraying with water
- covering
- use of vacuum cleaner

Removal of materials to include processes of recycling and salvage where applicable.

OH&S requirements to be in accordance with (company/industry) guidelines and regulations.

Work to be undertaken as part of a team or individually under supervision of appropriately certificated persons where applicable.

Reporting of faults may be verbal or written.

EVIDENCE GUIDE

Competency is to be demonstrated by the effective handling and storing/stacking of appropriate construction materials listed within the range of variables statement, relevant to the work orientation.

(1) Critical Aspects and Evidence

It is essential that competence is observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations and Industry guidelines applicable to workplace operations
- indicate compliance with organisational policies and procedures including Quality Assurance requirements
- carry out correct procedures prior to and during application of materials handling processes
- demonstrate safe and effective operational use of tools and equipment
- demonstrate safe application in the process of cleaning up
- interactively communicate with others to ensure safe and effective operations

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant codes and regulations
- hand tools and equipment
- materials
- materials handling
- Quality Assurance
- range of communication mediums (verbal and non-verbal)

Skills
The ability to:

- work safely to instructions
- use hand and portable tools
- handle materials
- identify/select material
- measure
- communicate effectively
- dispose of material safely
- use disposal equipment and tools as required

(4) Resource Implications

The following resources should be made available:

- general engineering and construction materials relative to construction processes
- plant and equipment appropriate to handling processes
- hand tools appropriate to handling processes
- suitable work area appropriate to construction process
- OHSA information

(5) Method of Assessment

Competency shall be assessed while work is being done under direct supervision with regular checks, but may include some autonomy when working as part of a team.

Competency in this unit may be determined concurrently, based on integrated project work.

Assessment may be by intermittent checking at the various stages of the job application in accordance with the performance criteria, or may be at the completion of each process.

(6) Context of Assessment

Competency shall be assessed in the workplace or simulated workplace environment in accordance with work practices and safety procedures.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMAH0071A: Perform manual handling and lifting

Competency Descriptor: This unit deals with the skills and knowledge required to effectively manually handle materials as applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Material handling

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Lift materials manually	1.1 Material weight is determined correctly utilising most appropriate technique.
	1.2 Lifting techniques are undertaken to safe work standards, standard operating procedures. (Type of movement, methods of movement, storage condition, height and position).
2. Move/shift materials manually	2.1 Appropriate equipment are selected where required
	2.2 Material is placed safely and securely on moving equipment
	2.3 Material is relocated ensuring safety of personnel and security of material.
	2.4 Material is unloaded from moving equipment and placed in a safe and secure manner.

RANGE STATEMENT

Work undertaken under supervision or in a team environment. Material weight is determined utilising scales or interpreting signage. Maximum manual lifting weight limited to safe work standards. All work and work practices undertaken to regulatory and standard requirements and standard operating procedures where applicable.

Moving/shifting equipment may include but not limited to:

- hand trolleys
- wheelbarrows
- motorised/hand pallet trucks (not sit on),
- hand carts
- dedicated production or process lifting equipment
- baskets
- spreader bars
- cradles or the like attached to lifting equipment
- rope

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively manually handling materials in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to handling materials
- demonstrate safe and effective operational use of lifting equipment, tools, and attachments
- demonstrate correct procedures in manual handling
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations demonstrate effective handling technique to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling recording and reporting associated with manual handling or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- basic reading
- basic numeracy
- material classification
- manual handling technique(s)/methods
- handling processes
- material identification, transportation and storage
- handling tools and equipment
- materials preparation
- manual handling
- weight determination
- drawings, sketches, signage and instructions

Skills
The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings signage and instructions
- use handling tools and equipment
- identify/select material
- identify/select handling method
- handle material, tools and equipment
- determine weights
- identify/select materials relative to transportation and storage methods
- manual handle material/equipment efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMSUF0061A: Prepare for the application of protective coatings

Competency Descriptor: This unit deals with the skills and knowledge required for effectively carrying out preparation for application of protective coatings and applies to individuals working in metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan for process	1.1 Quality Assurance requirements of company's/manufacturer's protective coating operations are recognised and adhered to.
	1.2 Preparation and planning requirements are identified from drawings and/or plans.
	1.3 Occupational Health and Safety (OH&S) requirements are determined and adhered to in accordance with application tasks and workplace environment.
	1.4 Safety hazards are identified and correct procedures adopted to minimise risk to self and others.
	1.5 Materials are selected according to supervisor's instructions and safely handled, stored and ready for application.
	1.6 Appropriate personal protective equipment are selected, correctly fitted and used.
	1.7 Tools and equipment are selected and is consistent with job requirements.
	1.8 Tools and equipment are checked for serviceability and any faults reported to supervisor.
	1.9 Fixing/fasteners/jigs selected are consistent with job requirements and checked for serviceability.
2. Prepare materials selected for protective coating process	2.1 Activities for material preparation are identified from specifications or supervisor's instructions.
	2.2 Fasteners/fixing are prepared for installation.
	2.2 Material preparation is carried out to satisfy requirements of fabrication/manufacturing process.

3.	Prepare work area suitable for protective coating process	3.1	Activities to be carried out in work area are identified from surfaces to be finished and height to be accessed.
		3.2	Work area is prepared for protective coating process to supervisors instructions.
4.	Use tools, plant and equipment appropriate for protective coating	4.1	Regular hand and power tools suitable for the application process is identified with job requirements.
		4.2	Hand and power tools are used safely and effectively to carry out processes.
5.	Assist with initial preparation of surfaces for protective coating	5.1	Sound surfaces are prepared by sanding, blasting, brushing and/or washing
		5.2	Unsound surfaces are prepared by scraping and/or sanding.
6.	Assist with preparing surfaces for final finish	6.1	Stopping/filling materials are applied to a flush and even finish.
		6.2	Surface is sanded by hand/tools.
		6.3	Primer/sealer/undercoats are applied to surface by brush and/or roller.
7.	Clean up	7.1	Materials are stacked /stored for re-use or disposal.
		7.2	Work area is cleared.
		7.3	Tools and equipment are cleaned and stored in a cool place.
		7.4	Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements.

RANGE STATEMENT

This unit applies to the work undertaken in a team environment for the preparation and subsequent application of protective for metal engineering and maintenance trade areas.

Process includes:

- worksite preparation
- surface preparation
- application of prime and intermediate coatings

Tools and equipment may include but not limited to:

- scrapers
- filling
- knives/blades
- putty knives
- duster brushes
- hand sanders
- mechanical sanders
- paint stirrers
- drop sheets
- wire brushes
- hammer
- nail punches
- paint pans/buckets
- spray paint equipment and accessories
- brush-ware accessories
- roller frames
- covers
- roller accessories
- ladders
- trestles
- planks
- hop-ups
- aluminium mobile scaffolding

Materials may include:

- preparatory products
- paints – solvent-borne (alkyd, urethane, urethane/alkyd, urethane oil or modified alkyd resins) and latex (PVA, PVA/acrylic, acrylic and styrene acrylic)

Surfaces to be treated may include common profiles encompassing:

- ply
- building boards (including MDF and particle board)
- fibre cement products, iron and steel
- zinc coated and zinc alloy coated steel products
- masonry products
- clay bricks
- concrete blocks
- concrete surfaces
- cement render
- set plaster
- plaster glass products
- paper-faced gypsum plaster board
- previously coated/treated surfaces
- fabricated steel products

EVIDENCE GUIDE

Competency is to be demonstrated by the safe and effective preparation of materials using the processes listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- indicate compliance with organizational policies and procedures including Quality Assurance requirements
- carry out correct procedures carried out prior to and during application of construction process
- use tools, plant and equipment safely and effectively
- Processes comply with preparation of surfaces for protective coating

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Apply principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0191A Use hand tools
- MEMCOR0111A Use power tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements
- portable power tools
- hand tools and equipment
- materials relevant to application of protective coating
- materials handling
- measurement and calculation
- interpreting simple diagrams
- fixing and fasteners consistent with painting and decorating requirements
- workplace communication requirements

Skills
The ability to:

- work safely to instructions
- use power and hand tools
- handle material
- select material
- communicate effectively
- measure relative to the process
- prepare for the application of protective coating

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials.

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0071A: Undertake fabrication, forming, bending and shaping

Competency Descriptor: This unit deals with the skills and knowledge required to effectively undertake fabrication, forming, bending and shaping as applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Select and set up forming/shaping equipment for a specific operation	1.1 Most appropriate tools and equipment are selected.
	1.2 Equipment are correctly set up and adjusted for operation
	1.3 Allowances for shrinkage, thickness, inside/outside measurements are correctly made.
2. Operate forming/shaping equipment	2.1 Machine is safely started and shut down to standard operating procedure.
	2.2 Material and safety guards are correctly positioned.
	2.3 Equipment are correctly operated and adjusted.
3. Form and shape material	3.1 Material is levelled, straightened, rolled, pressed or bent to specifications/drawings.
	3.2 Correct hot or cold-forming procedures are followed.
	3.3 Final form/shape is checked for compliance to specification and adjusted as necessary to standard operating procedure.

RANGE STATEMENT

Work may be undertaken under supervision or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures.

A wide range of shapes and products are formed which may include but not limited to:

- pipe-work chamfers
- cylinders
- cones,
- angles
- hoppers
- ductwork
- "square to round" "transitions"
- "lobster backs"
- all forms of tubular shapes
- hand rails,
- reticulation pipe-work, mufflers et

Forming, shaping and bending operations may
be conducted on:

- plate
- section or sheet
- tube
- pipes
- components

Materials may include:

- ferrous and non ferrous
- non-metalic substances

A variety of tools and equipment may be used including

- presses
- shapers
- vices
- benders
- drop hammers

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively undertaking fabrication, forming, bending and shaping operations in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking fabrication, forming, bending and shaping processes

Critical Aspects of Evidence (Cont'd)

- demonstrate correct procedures in setting up
- demonstrate safe and effective operational use of tools, plant and equipment
- forming, bending and shaping equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material and tools
- interactively communicate with others to ensure safe operations
- demonstrate effective fabrication, forming, bending and shaping technique to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the forming and shaping of fabricated components or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering
- MEMCOR0091A Draw and interpret sketches and simple drawing
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- fabrication, forming, bending and shaping technique
- fabrication, forming, bending and shaping equipment
- hand tools and equipment
- materials /consumables relative to fabrication, forming, bending and shaping procedures
- materials preparation
- manual handling
- measurement
- technical drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- interpret related drawings and instructions
- use power tools and hand tools
- select material and equipment
- measure relative to fabrication, forming, bending and shaping processes
- communicate effectively
- fabricate, form, bend and shape efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working under supervision or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0041A: Remove/install standard mechanical seals

Competency Descriptor: This unit deals with skills and knowledge required to competently remove/install standard mechanical seals and applies to individuals in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Determine mechanical seal requirements	1.1 Principles of mechanical seals are understood.
	1.2 Operational function of mechanical seals and components are understood.
	1.3 For new mechanical seal installation, specifications are interpreted from engineering drawings etc.
2. Dismantle mechanical seal installations	2.1 Mechanical seal assembly are examined and appropriate dismantling techniques, tools and equipment are selected.
	2.2 Mechanical seal assembly is dismantled using correct and appropriate engineering techniques and safe workshop procedures.
	2.3 All components and parts are examined for wear to determine need for repair or replacement.
	2.4 Where applicable, serviceable items are repaired by appropriate means.
	2.5 Primary sealing elements and secondary seals are removed for replacement where required.
3. Select replaceable items	3.1 Replaceable items are selected using manufacturer's catalogues; spare parts lists, engineering specifications or sample.

4.	Reassemble mechanical seal installations	4.1	Mechanical seal components are fitted together including seal head, secondary seals, seat assembly shaft and housing.
		4.2	Mechanical seal assembly is tensioned and adjusted to manufacturer's specifications.
		4.3	Mechanical seal assembly is tested using appropriate methods for compliance with specifications.

RANGE STATEMENT

Work undertaken under supervision using predetermined standards of quality, safety and workplace procedures.

Tasks involve the checking, installation, removal and replacement of a range of mechanical seals including carbon, stellite, neoprene and other associated materials.

Skills covered by this unit include the knowledge of appropriate applications for a range of mechanical seals and the ability to remove, select, repair or replace all component parts of the seal. All removal and installation practices to be undertaken in conformance to safe workplace practices and procedures, using correct tools and equipment.

Seal replacements selected from manufacturer's catalogues, spare parts lists or engineering specifications. Included is the fitting of mechanical seals in new installations according to specifications interpreted from engineering drawings.

Lubrication requirements attended to according to supplier's instructions and recommendations or specifications.

Mechanical seal assembly tested using appropriate methods for compliance with specifications and operational performance.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing and installing mechanical seals in accordance with the range listed within the range of variables statement.

(1) Critical Aspect of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to removal and installation of mechanical seals
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing mechanical seals
- demonstrate correct procedures in installing mechanical seals
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0191A Use hand tools
- MEMCOR0111A Use power tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic tools for mechanical seals removal/installation
- standard removal/installation tasks
- standard mechanical seals
- standard operational test for mechanical seals
- standard application of mechanical seals
- reading
- writing basic English
- basic numeracy

Skills
The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and installation of mechanical seals

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0061A: Remove and replace basic pneumatic system components

Competency Descriptor: This unit deals with skills and knowledge required to competently remove and replace pneumatic system components and applies to mechanical maintenance personnel.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Check pneumatic system components	1.1 System components are identified correctly.
	1.2 The characteristics and basic operational function of each component is understood.
	1.3 The operational function of each component is inspected and tested by supervisor.
	1.4 Correct operation of each component assessed against specifications.
2. Identify, remove/replace faulty pneumatic system components	2.1 Faulty system components are identified and malfunction confirmed by supervisors report or inspection and testing.
	2.2 Faulty system components are removed and replaced to manufacturer's/site specifications.
	2.3 Replacement parts are selected from manufacturer's specifications
	2.4 System components are tested for correct operation assessed against specifications.
	2.5 Correct operation of the pneumatic system is confirmed to standard operating procedure.
	2.6 Appropriate follow up procedures are adopted according to standard operating procedure.
	2.7 Where appropriate, service reports are completed using standard operating procedures.

3.	Clean up	3.1 Materials/supplies are stacked /stored for re-use or disposal.
		3.2 Work area cleared.
		3.3 Tools and equipment are cleaned and stored in a cool place.
		3.4 Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements company's operating procedures.

RANGE STATEMENT

Work undertaken under supervision using predetermined standards of safety, quality and work procedures.

Pneumatic system components identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and maintenance diagrams.

Removal and replacements to site or manufacturers specifications.

Pneumatic system components may include high pressure seals, linear, rotary actuators, directional control valves, proportional valves, timers, counters, sensors, pneumatic motors, pressure control valves, lines, hoses and other associated equipment.

Location/condition may include:

- workshops
- plants
- in the field
- confined spaces
- elevated positions
- damp and wet situations

Protective clothing may include:

- safety boots
- safety helmet
- welding helmet
- coverall
- leggings
- gloves

Applications may include hand tools used for:

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- cleaning
- lubricating
- tightening
- simple tool repairs
- hand sharpening
- adjustments

Hand tools may include but not limited to:

- hacksaws
- hammers
- punches
- screwdrivers
- sockets
- wrenches
- scrapers
- chisels
- gouges
- files of all cross-sectional shapes and types

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing and replacing pneumatic system components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to removal and replacement of pneumatic system components
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing pneumatic system components
- demonstrate correct procedures in installing pneumatic system components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal/replacing pneumatic system components
- standard characteristics of basic pneumatic system components
- standard removal/replacing tasks
- standard pneumatic system components
- standard operational test for pneumatic systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Underpinning Knowledge and Skills (cont'd)

Skills
The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of pneumatic system components

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0071A: Remove and replace basic hydraulic system components

Competency Descriptor: This unit deals with the skills and knowledge required to effectively maintain hydraulic system components and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Identify and check hydraulic system components	1.1	System components are identified correctly.
		1.2	The characteristics and basic operational function of each system component are understood.
		1.3	The operational function of each component is inspected and tested by supervisor.
2.	Remove and replace faulty hydraulic system components	2.1	Faulty system components are identified and malfunction confirmed by supervisors report or inspection and testing.
		2.2	Faulty system components are removed and replaced to manufacturer's/site specifications.
		2.3	Replacement parts are selected from manufacturer's catalogues according to required specifications.
		2.4	System components are reassembled and tested for correct operation and assessment against specifications.
		2.5	Correct operation of the hydraulic system is confirmed to designated operating procedure.
		2.6	Appropriate follow up procedures are adopted according to standard operating procedure.
		2.7	Where appropriate, service reports are completed using standard operating procedures.
3.	Clean up	3.1	Materials/supplies are stacked /stored for re-use or disposal.
		3.2	Work area is cleared.

3.3 Tools and equipment are cleaned and stored in a cool place.

3.4 Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements and company's operating procedures.

RANGE STATEMENT

Work undertaken under supervision using predetermined standards of safety, quality and work procedures.

Hydraulic system components identified, inspected and assessed using fluid power principles to predetermined specifications interpreted from data sheets and maintenance diagrams.

Removal and replacements carried out to site or manufacturer's specifications.

Hydraulic system components may include high pressure seals, linear, rotary actuators, directional control valves, proportional valves, timers, counters, sensors, pumps, pressure control valves, lines, hoses and other associated components.

RANGE STATEMENT

Competency is to be demonstrated by safely and effectively removing and replacing hydraulic system components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to removal and replacement of hydraulic system components
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing hydraulic system components
- demonstrate correct procedures in replacing hydraulic system components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0071A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal/replacing hydraulic system components
- standard characteristics of basic hydraulic system components
- standard removal/replacing tasks
- standard hydraulic system components
- standard operational test for hydraulic systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Skills
The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of pneumatic system components

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMPO0011A: Perform daily operational maintenance of machines/equipment

Competency Descriptor: This unit deals with skills and knowledge required to competently perform daily operational maintenance of machines/equipment and applies to and applies to individuals in the industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Undertake programmed safety and maintenance checks	1.1	Checks are undertaken safely and to prescribed procedure.
		1.2	Status/report are recorded on check sheet or reported orally.
2.	Undertake programmed maintenance	2.1	Removal/replacement of consumable and components are undertaken to prescribed procedure and instructions are followed.
		2.2	Fluids and lubricants are replaced and/or topped up to prescribed schedule.

RANGE STATEMENT

Work undertaken under supervision or in a team environment to predetermined specifications.

Machines/equipment range includes manuals, semi-automatic and automatic machines of a stand-alone continuous production or process nature.

Consumable replacements include air filter, oil wipers, grease containers, tool tips, indicator globes, fluids and lubricants, guides and limit switch actuators.

Adjustments are of a limited nature and include safety guards, stops, wear pads and tool holders, nipping up of glands and adjustment of scrapers and aprons etc.

Hand tools may include but not limited to:

- hacksaws
- hammers
- punches
- screwdrivers
- sockets
- wrenches
- scrapers
- chisels
- gouges
- wood planes
- files of all cross-sectional shapes and types.

Applications may include hand tools used for

- adjusting,
- dismantling
- assembling
- finishing
- cutting
- scraping
- cleaning,
- lubricating,
- tightening
- simple tool repairs
- hand sharpening
- adjustments

Location/condition may include:

- workshops
- plants
- in the field
- confined spaces
- elevated positions
- damp and wet situations

Protective clothing may include:

- safety boots
- safety helmet
- welding helmet
- coverall
- leggings
- gloves

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine operational maintenance of machines/equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to performing routine operational maintenance of machines/equipment
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in performing programmed maintenance checks
- demonstrate correct procedures in starting and stopping machines/equipment

- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0141A (Follow principles of occupational health and safety (OH&S) in work environment)
- MEMCOR0161A (Plan and undertake a routine task)

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic measuring devices
- standard machines/equipment range
- standard consumable replacements
- standard machine/equipment adjustments
- reading
- writing basic English
- basic numeracy

Skills
The ability to:

- follow safely to instructions
- use power tools and hand tools
- use measuring devices
- adjust measurements
- handle materials
- select material
- apply quality assurance
- perform operational maintenance of machines/equipment

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0081A: Remove dismantle, assemble and replace basic engineering components

Competency Descriptor: This unit deals with the skills and knowledge required to effectively remove dismantle, assemble and replace engineering components and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Check engineering components	1.1	System components are identified correctly.
		1.2	The characteristics and basic operational function of each system component are understood.
		1.3	The operational function of each component are inspected and tested by supervisor.
2.	Remove/replace engineering components	2.1	Engineering components are inspected by supervisor and task requirements analysed.
		2.2	Appropriate tools and equipment are selected and component/s are prepared for removal/replacement.
		2.3	Components are removed/replaced using standard operating procedures, tools and equipment.
		3.4	Engineering components are clearly marked to aid reassembly.
3.	Dismantle engineering components	3.1	Engineering components are inspected by supervisor and task requirements analysed.
		3.2	Appropriate tools and equipment are selected and component/s prepared for dismantling.
		3.3	Components are dismantled using standard operating procedures, tools and equipment.
		3.4	Engineering components are clearly marked to aid reassembly.

4.	Replace faulty components	4.1	Specifications for components are obtained from appropriate source and verified by supervisor.
		4.2	Damaged or faulty components are assessed by supervisor against specifications.
		4.3	Faulty components are identified for repair, replacement or adjustment.
5.	Select replacement components	5.1	Where applicable, replacement and/or repaired parts are selected for reassembly.
6.	Assemble basic engineering components into assemblies or sub-assemblies	6.1	Appropriate techniques are applied in the preparation, assembly and adjustment of components.
		6.2	Correct lubrication, packing and sealing materials are applied correctly and in conformance to job specifications and supervisor instructions.
		6.3	Final component is assembly inspected, tested and adjusted as necessary for compliance with operational specifications.
		6.4	Final component is returned to use according to standard operating procedure.
7.	Clean up	7.1	Materials/supplies are stacked /stored for re-use or disposal.
		7.2	Work area is cleared.
		7.3	Tools and equipment are cleaned and stored in a cool place.
		7.4	Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements and company's operating procedures.

RANGE STATEMENT

Work undertaken under supervision or in a team environment using predetermined standards of quality, safety and workshop procedures.

This unit involves the dismantling, inspection, replacement, assembling of engineering components.

All specifications interpreted from manufacturers' manuals, engineering drawings, detailed/technical sketches and associated data sheets.

Tasks are undertaken utilising engineering principles, designated procedures, appropriate tools, equipment and safe workshop practices.

Replacement parts are proved by supervisor and selected from manufacturers' catalogues, etc.

Appropriate techniques utilised in the assembly of component parts using fastening equipment and methods which ensure conformance to specifications, operational performance, quality and safety; this may include the straightforward removal and replacement of pre-manufactured bearings and seals.

Appropriate lubrication, packing, sealing materials are selected and applied in conformance to standard operating procedure.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively removing, dismantling, assembling and replacing engineering components in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in removing/replacing engineering components
- demonstrate correct procedures in dismantling and assembling engineering components
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies
- interactively communicate with others to ensure safe operations demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0051A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0071A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic tools for removal, replacing, dismantling and assembling engineering system components
- standard characteristics of basic engineering system components
- standard removal/replacing tasks
- standard engineering system components
- standard operational test for basic engineering systems
- manufacturers standard specification
- standard application/operation of pneumatic system components
- reading
- writing basic English
- basic numeracy

Skills
The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select seals
- apply quality assurance
- perform removal and replacement of engineering system components

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMPO0021A: Perform general machining operations

Competency Descriptor: This unit deals with the skills and knowledge required to effectively perform general machining operations as applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Determine job requirements	1.1	Job specification requirements are determined from job sheets and/or instructions.
		1.2	Appropriate method/machine/tools are selected to meet specifications
		1.3	Parts and material are obtained and checked
		1.4	Work area is prepared
		1.5	Machine is loaded and adjusted appropriately for operation consistent with standard operating procedures.
2.	Follow sequence of operations	2.1	Sequence of operations are followed including job set up for maximum efficiency and to meet job specifications
		2.2	Machine operating instructions are followed (start-up, normal close down, emergency close down, operating sequence)
		2.3	Appropriate material is selected and datum established a required
3.	Select and mount tools	3.1	Appropriate tools for the job is selected, sharpened and shaped as required
		3.2	Tools are mounted and positioned correctly
4.	Perform machining operations	4.1	Basic marking out techniques is used where required
		4.2	Machining parameters are set for job requirements and maximum tool life

		4.3	Work is held or correctly clamped without damage to product.
		4.4	Machining is performed in a safe manner utilising all guards, safety procedures and personal protective clothing and equipment
5.	Measure components	5.1	Components are checked with appropriate instruments or gauges to ensure compliance with specifications
6	Adjust and maintain machine	6.1	Routine maintenance and adjustments are carried out as required which may include slide and collar adjustment, cleaning and lubrication.
7.	Clean up	7.1	Materials are stacked/stored for re-use or disposed of.
		7.2	Work area is cleared.
		7.3	Tools and equipment are cleaned, maintained and stored.

RANGE STATEMENT

Machining is undertaken on one or more of a range of standard machine tools.

Work is undertaken under supervision to predetermined specifications and standards of quality and safety.

Machines may include lathes, mills, planers, shapers, drills, slotters, surface grinders, etc.

Materials may include standard ferrous and non-ferrous materials.

Operations and set up carried out on those machines are straightforward and may include parallel cutting, slotting, planing, drilling, knurling, cutting flats, non-precision surface grinding operations etc.

Surface grinding operations covered by this unit are those requiring magnetic chucks and grinding of flat surfaces.

Machining parameters include speeds, feeds, stops, coolant and cutting lubricants etc.

Source of information:

- Appropriate job specification
- oral information/instructions
- Written and diagrammatic
- process sheets
- job cards
- operation sheets
- drawings
- specifications
- schedules

Safe working practices and

- Safety equipment
- protective clothing
- job instruction
- company/statutory regulations
- health and safety instruction

Work environment:

- workshop situations
- plant locations

Instruments:

- measuring tapes
- steel ruler
- vernier callipers
- feeler gauges
- slip gauges
- internal, external, depth and height instruments
- range of micrometer instruments

Working hold devices Including:

- jigs/fixtures
- vices
- chuck/collets
- mounting direct to table,
- automatic or manual operation

Hand tools and equipment to include:

- laying out tools
- hacksaws
- range of machining files
- vices
- wire brushes
- try- squares
- bench and pedestal grinders,
- taps
- dies
- stud extractors
- drifts
- spanners, screwdrivers
- hammers
- mallets
- pliers
- centre punches, scribes, chisels, centre gauges,
- measuring (verniers, callipers, drill bits)
- bench and pedestal grinders,
- conventional milling machine
- conventional metal turning lathes
- tongue wrenches,
- hand drills
- punches
- allen keys
- pipe wrenches

Activities may include:

- Preparing to undertake machining operation
- Carrying out benchwork fitting operations
- Cut and shape material to finished size using hand tools
- Sharpen hand tools using off hand grinding machine
- Using common machine setting tools
- Milling Materials/Components On Horizontal Milling Machines
- Setting up Metal Lathe Machines
- Turning Metal Materials/Components on Capstan,Centre or Turret Lathe

EVIDENCE GUIDE

Competency is to be demonstrated safely and effectively when performing general machining operations in accordance with the range listed within the range of variables statement

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to performing general machining operations and during the machining process
- demonstrate safe and effective operational use of measuring instruments, tools, plant and equipment
- demonstrate correct procedures in using milling machinery
- demonstrate the correct procedures in using metal turning machinery
- demonstrate the ability to shape materials/components on milling machines
- demonstrate the ability to turn and shape materials/components on metal turning lathes
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective machining to produce designed cut/shape material

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the machining of materials or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- materials (ferrous and non-ferrous)
- bench, pedestal and surface grinders
- conventional milling machine
- conventional metal turning lathes
- general machining processes operations or activities
- hand tools, measuring instruments and equipment
- materials relative to cutting processes
- materials preparation
- manual handling
- engineering measurement
- related calculations
- drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- interpret relative drawings and instructions
- use common engineering power tools and hand tools
- use standard engineering measuring instruments
- select/prepare material
- measure relative to machining processes
- perform calculations relative to machining process
- communicate effectively
- use accepted engineering techniques, practices, processes and workplace procedures.
- perform general machining operations

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures.
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0141A: Develop geometric shapes – (basic)

Competency Descriptor: This unit deals with the skills and knowledge required to effectively develop basic geometric shapes and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Transfer dimensions from a sketch or simple drawing to work piece	1.1	Specifications and work requirements are identified and understood using correct and appropriate calculations.
		1.2	Development is carried out to specifications or standard operating procedures using appropriate tools and equipment.
		1.3	Datum points are correctly established.
2.	Make templates as required	2.1	Appropriate template material is chosen.
		2.2	Templates are produced to specification.
		2.3	Correct storage procedures are followed including labelling and identification to standard operating procedures.
3.	Develop patterns as required	3.1	Parallel line, radial line and triangulation development methods are chosen and applied.
		3.2	Allowances for fabrication and assembly are correctly transferred.
4.	Identify relevant codes, standards and symbols	4.1	Relevant standards/codes and symbols are identified.
		4.2	Requirements of standards/codes are applied to materials and processes.
5.	Collect quantities of materials from storage area	5.1	Materials are correctly identified.
		5.2	Quantities are estimated from sketches and simple drawings.
		5.3	Material wastage is minimised.

RANGE STATEMENT

This unit applies to marking out of general fabrications using geometric development. Work is undertaken under supervision using predetermined standards of quality, safety and workshop procedures.

The task may be performed in the workshop or site. Marking out is undertaken using appropriate tools and equipment, and templates and patterns are produced as required.

Marking out covers but not limited to:

- engineering components
- jigs and fixtures
- castings
- templates
- dies and tooling
- marking out tables
- surface tables
- rotary tables
-

Equipment may include but not limited to:

- sine bars and the like
- vernier height gauges
- protractors
- straight edge
- set squares
- marking out tools
- dividing heads etc.
- vee blocks
- cylinder squares

Sketches or simple drawings may include:

- circles
- regular polygons with four, seven and eight sides
- pentagon inscribed within measured circle
- ellipse
- triangles with specified angles
- arcs thru three points; tangent to two circles

Relevant codes/standards and symbols may include:

- object line
- hidden line
- centre line
- section line
- dimension
- extension line
- cutting line
- short break line
- phantom line

Patterns and templates made from:

- wood
- paper (firm)
- plastics

Measurement systems:

- inch/foot system
- metric(SI) system

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively by marking out of general fabrications using geometric development in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the fabrication process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to develop basic geometric shapes relative to the fabrication process
- communicate information about fabrication processes, being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all related tasks in accordance with standard operating procedures
- perform tasks efficiently and to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0051A Perform related computations – (basic)

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- tools
- drawing interpretation
- basic numeracy
- marking off/out techniques
- materials relevant to the engineering process
- basic operations in simple geometry measurement and calculations
- basic development processes

Skills
The ability to:

- work safely to instructions
- use marking out tools and equipment
- handle materials
- select tools/equipment
- select material
- transfer measurements apply quality assurance
- read and interpret drawings and specifications
- measure and calculate manually
- record measurement

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures.
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages processes • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0061A: Perform manual heating and thermal cutting

Competency Descriptor: This unit deals with the skills and knowledge required to effectively perform manual heating and thermal cutting and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Assemble/disassemble plant, equipment for manual heating and thermal cutting	1.1 Appropriate cutting process and/or procedure for material are selected.
	1.2 Accessories and equipment are correctly selected and assembled.
2. Operate heating and thermal cutting equipment	2.1 All safety procedures are observed.
	2.2 Equipment start up procedures is followed correctly and to standard operating procedures.
	2.3 Equipment adjustments are made correctly using standard operating procedures.
	2.4 Appropriate cutting allowances are made.
	2.5 Materials are used in the most economical way.
	2.6 Defects are recognised and corrective action taken to standard operating procedures.
	2.7 Materials are heated and cut to specification shape/size/length and to accepted workplace standards.

RANGE STATEMENT

Work is undertaken under supervision or as part of a team. Predetermined standards of quality and safety are observed and work is carried out following standard operating procedures.

- Manual, straight line cutting standards observed.
- Manual or automatic processes used to cut and heat to specifications

Cutting may include flame gouging by hand. All work carried out to standard and regulatory requirements.

Cutting may be applied to material of various thicknesses and types including ferrous, non-ferrous and non-metallic materials by a variety of methods, which may include fuel gas oxy fuel gas and air fuel gas.

Cutting may include use of hand held and self-propelled straight-line cutters.

Heating may be applied to material of various thicknesses and types including ferrous, non-ferrous and non-metallic materials by a variety of methods, which may include fuel gas, oxy fuel gas and air fuel gas.

Materials welded may include:

- low carbon steel
- cast iron

Setting up may include the correct connection of:

- hoses
- blowpipes
- regulators
- settings of gas mixtures

Preparation of materials would be minimal and may include but not limited to:

- preheating
- setting up jigs
- setting up fixtures
- setting up clamps

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine manual heating and thermal cutting in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to setting up equipment and during the heating and cutting process
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in setting up and shutting down equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective heating and thermal cutting techniques to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with manual heating and thermal cutting or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0081A Mark off/out (general engineering)
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- heating medium/technique
- heating/cutting processes
- oxy-fuel equipment identification, transportation and storage
- hand tools and heating/cutting equipment
- materials/consumables relative to oxy-fuel heating and thermal cutting procedures
- materials preparation
- manual handling
- measurement
- drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- communicate effectively
- interpret relative drawings and instructions
- use power tools and hand tools
- set up heating cutting equipment
- use heating cutting equipment
- identify/select material
- identify/select heating/cutting processes
- measure relative to heating and thermal cutting processes
- heat/cut efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

MEMFAB0051A: Perform brazing and/or silver soldering

Competency Descriptor: This unit deals with the skills and knowledge required to effectively perform brazing and /or silver soldering as applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Prepare materials and equipment	1.1 Job requirements are determined from specifications and/ or instructions.
	1.2 Materials are correctly prepared using appropriate tools and techniques.
	1.3 Materials are correctly assembled/aligned to meet specifications as required.
	1.4 Distortion prevention measures are identified and appropriate action taken as required.
	1.5 Heating equipment is assembled and set up safely and correctly in accordance with standard operating procedures.
	1.6 Correct and appropriate consumables are selected and prepared.
	1.7 Test run undertaken and verified as required.
2. Braze and/or silver solder	2.1 Correct and appropriate processes are selected to meet specifications.
	2.2 Materials are preheated as required.
	2.3 Consumables are applied using correct and appropriate techniques.
	2.4 Jointing material is applied correctly and in appropriate quantities to meet job/specifications.
	2.5 Used correct temperature and appropriate techniques.

3	Inspect joints	3.1	Excess jointing materials are removed using correct and appropriate techniques.
		3.2	Inspection of joints is undertaken using standard operating procedures and meeting specifications.
		3.3	Inspection results are reported/recorded using standard operating procedures as required.

RANGE STATEMENT

Work undertaken in a production, engineering or maintenance environment using predetermined standards of quality, safety and work procedures. Work may be undertaken under supervision or within a team environment. All work undertaken to standard requirements

Appropriate assembly of heating equipment may include:

- cylinders
- connections
- hoses
- tips
- nozzles

Heating medium and appropriate consumables can include:

- oxyacetylene
- fuel gas
- fluxes (resin or powder)
- all types of silver solder and brazing rods

Materials:

- low carbon steel (mild steel) up to 10 gauge
- low carbon steel plate up to 5mm
- steel and galvanised pipes up to 50mm

Location/condition:

- workshop
- plant
- fieldwork at ground level
- elevated positions
- dry
- humid and wet conditions
- construction environment
- agricultural environment
- food processing environment

Work activities:

- measuring,
- marking,
- grinding
- lifting,
- welding
- cutting
- aligning,
- shaping,
- filing,
- general machining

Specification:

- welding procedure
- weld profile regular in width
- even/regular ripple formation
- uniform in appearance,
- free from excessive undulations
- smooth stop/starts, tack incorporated,
- adequate penetration
- no excess undercut
- no craters

Types of welding joints:

- fillet weld
- lap weld
- butt weld,
- single and multi-run

Welding position:

- flat,
- vertical
- horizontal
- overhead

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively performing routine oxyacetylene welding (fuel gas welding) in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to setting up oxy acetylene equipment and during the brazing and or silver soldering process
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in setting up and shutting down oxy acetylene equipment
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective brazing and or silver soldering technique to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling recording and reporting associated with brazing and/or silver soldering or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR01611A Plan and undertake a routine task
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- metal properties and classification
- heating medium/technique
- brazing/soldering processes
- oxy-fuel equipment identification, transportation and storage
- hand tools and equipment
- materials /consumables relative to brazing and silver soldering procedures
- materials preparation
- manual handling
- measurement
- drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use brazing and soldering equipment
- identify/select material
- identify/select brazing soldering processes
- handle material, tools and equipment
- measure relative to brazing and or silver soldering processes
- identify/select materials relative to the brazing and or soldering process
- prepare materials relative to the brazing and or soldering process
- braze and or silver solder efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0151A: Prepare for oxyacetylene/metal arc welding processes

Competency Descriptor: This unit deals with the skills and knowledge required to effectively prepare the process for carrying out oxyacetylene/metal arc welding processes and applies to individuals working in metal engineering and maintenance industry.

Competency Field: Metal Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan for installation process	1.1 Quality Assurance requirements of engineering /maintenance operations are recognized and adhered to.
	1.2 Preparation and planning requirements are identified from drawings/work location and/or supervisor's instructions.
	1.3 OH&S requirements are identified and adhered to in accordance with application tasks and workplace environment.
	1.4 Safety hazards are identified and correct procedures adopted to minimise risk to self and others.
	1.5 Materials are selected, safely handled and stored/located ready for application.
	1.6 Appropriate personal protective equipment are selected, correctly fitted and used.
	1.7 Tools and equipment selected are consistent with the job requirements,
	1.8 Tools and equipment selected are checked for serviceability and any faults reported to supervisor.
	1.9 Materials/components selected consistent with the job requirements where applicable and checked for damage.
2. Prepare equipment selected for welding process	2.1 Activities for equipment preparation are identified from specifications or supervisor's instructions.
	2.2 Equipment preparations are carried out to satisfy requirements of welding process.

3.	Prepare material selected for welding process	3.1	Activities for material preparation are identified from specifications or supervisor's instructions.
		3.2	Material preparation is carried out to satisfy requirements of welding process.
4.	Prepare work area suitable for welding process	4.1	Activities to be carried out in work area are identified from welding technique, method of welding and access to area.
		4.2	Work area is prepared for welding process according to supervisor's instructions.
5.	Set up tools, plant and equipment appropriate for welding process	5.1	Regular tools/measuring devices suitable for application processes are identified to job requirements.
		5.2	Regular tools/measuring devices are set up safely and effectively to carry out processes where applicable.
6.	Select materials, cut and prepare sections	6.1	Materials are obtained as per instruction.
		6.2	Correct manual handling techniques is used to move and place materials.
		6.3	Materials are safely moved to work area.
		6.4	Appropriate techniques used to accurately cut/bend/prepare/secure components to same length or given instruction.
7.	Distribute components	7.1	Components are distributed and stacked to suit job location and sequence.
8.	Clean up	8.1	Materials are stacked/stored for re-use or disposed of.
		8.2	Work area is cleared.
		8.3	Tools and equipment are cleaned, maintained and stored.

RANGE STATEMENT

This unit applies to the preparation processes carried out in preparing for welding processes using oxyacetylene and or metal arc welding techniques as per instructions.

Source of information:

- Specific work instructions/equipment manual
- health and safety requirements

Safety:

- personal safety
- hand tool safety
- welding safety
- manual lifting and handling

Types of hazards:

- faulty equipment
- premises,
- tools - obstructions
- hazardous substances
- faulty storage
- electrical wiring

Material to include:

- sheet metal
- steel plates
- pipes
- tubing

Work areas:

- fabrication layout
- maintenance
- welding
- finishing

Tools/equipment to include:

- power tools
- oxyacetylene welding and cutting equipment
- Angle grinders, pedestal grinders, surface grinders, rotary wire brushes
- hand and drill press
- cold chisel & files
- ball pein hammer
- arc welding equipment
- safety equipment
- work benches
- hack saw
- screwdrivers
- spirit level
- vices
- marking out tools
- chipping hammer

Protective clothing:

- coverall
- goggles
- gloves
- Safety boots
- safety helmet

Type of site and working conditions to include:

- workshop and on site
- at height as per industry standards
- in confined space
- indoors and out doors

Work is to be undertaken either as part of a team or individually, under supervision with instruction being as part of the supervisor's directions either verbal or written.

Reporting of faults may be verbal or written.

OH&S requirements to be in accordance with the Statutory regulations.

EVIDENCE GUIDE

Competency is to be demonstrated by carrying out the safe and effective preparation for oxyacetylene/metal arc welding processes accordance with performance criteria using any of the range of materials and processes listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- indicate compliance with organisational policies and procedures including Quality Assurance requirements
- carry out correct procedures prior to and during application of oxyacetylene/metal arc welding processes
- demonstrate safe working practices at all times
- demonstrate the ability to prepare for oxyacetylene/metal arc welding processes
- demonstrate the ability to apply appropriate principles/techniques to welding environment
- demonstrate the ability to carry out specific measurement and preparation procedures
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- use accepted engineering techniques, practices, processes and workplace procedures.
- demonstrate safe and effective operational use of tools, measuring devices and equipment
- interactively communicate with others to ensure safe and effective workplace operations

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Apply principles of Occupational Health and safety (OH&S) in work environment
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements
- drawings and specifications
- measuring devices
- hand tools and equipment
- materials relative to welding process
- materials handling
- measurement relative to welding process
- welding techniques consistent with oxyacetylene/metal arc welding processes
- workplace communications

Skills
The ability to:

- work safely to instructions
- use hand tools
- use measuring devices
- handle material
- select material
- communicate effectively
- measure relative to process
- prepare for oxyacetylene/metal arc welding processes

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activity

(6) Context of Assessment

Competency should be assessed in the workplace or simulated workplace environment in accordance with work practices and safety procedures.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0121A: Perform basic welding using oxyacetylene welding process (OAW) - fuel gas welding

Competency Descriptor: This unit deals with the skills and knowledge required to effectively perform basic welding using oxyacetylene welding (OAW) and applies to individuals working in the metal engineering and maintenance

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Prepare materials for welding	1.1 Weld requirements are identified from specifications and/or drawings.
	1.2 Material is correctly prepared using appropriate tools and techniques.
	1.3 Materials are assembled/aligned to specifications where required.
2. Assemble and set up welding equipment	2.1 Welding equipment is assembled and set up safely and correctly in accordance with standard operating procedures.
	2.2 Test runs are undertaken and verified in accordance with specifications.
3. Select welding equipment, settings and consumables	3.1 Welding settings and consumables are selected against job requirements, welding procedures, specifications and/or technical drawings.
4. Identify distortion prevention measures	4.1 Distortion prevention measures are identified.
	4.2 Appropriate action is taken to minimise and rectify distortion.
5. Weld joints to standard or equivalent	5.1 Welds are deposited correctly in flat and vertical position to specifications and industry standard (or equivalent).
	5.2 Correct action is undertaken to minimise distortion.
	5.3 Joints are cleaned to specifications using correct and appropriate tools and techniques.

6.	Inspect welds.	6.1	Weld joints are visually inspected against specifications.
		6.2	Weld defects are identified.
7	Correct faults	7.1	Remedial action taken as required.
		7.2	Correct remedial action taken and appropriate techniques and tools used.

RANGE STATEMENT

Oxyacetylene welding (OAW) would be carried out using a range of material for heavy or light fabrication. The person would work under supervision or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities. Weld quality must meet required industry standards or equivalent outcomes.
Preparation of materials would include preheating, setting up of jigs, fixtures, clamps etc.
Remedial action using thermal processes may include oxyacetylene and arc air equipment. Grinding devices may also be used.
Setting up may include the correct connection of hoses, blowpipes, regulators etc. and correct settings of gas mixtures.

Appropriate assembly of heating equipment may include:

- cylinders
- connections
- hoses
- tips
- nozzles

Heating medium and appropriate consumables can include:

- oxyacetylene
- fuel gas
- fluxes (resin or powder)
- all types of silver solder and brazing rods

Materials:

- low carbon steel (mild steel) up to 10 gauge
- low carbon steel plate up to 5mm
- steel and galvanised pipes up to 50mm

Location/condition:

- workshop
- plant
- fieldwork at ground level
- elevated positions
- dry
- humid and wet conditions
- construction environment
- agricultural environment
- food processing environment

Work activities:

- measuring,
- marking,
- grinding
- lifting,
- welding
- cutting
- aligning,
- shaping,
- filing,
- general machining

Specification:

- welding procedure
- weld profile regular in width
- even/regular ripple formation
- uniform in appearance,
- free from excessive undulations
- smooth stop/starts, tack incorporated,
- adequate penetration
- no excess undercut
- no craters

Types of welding:

- fillet weld
- lap weld
- butt weld,
- single and multi-run

Welding position:

- flat,
- vertical
- horizontal
- overhead

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively weld using oxyacetylene welding (fuel gas welding) in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the oxyacetylene welding process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to identify/select materials relative to the oxyacetylene welding process
- communicate information about oxyacetylene welding processes, being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all related tasks in accordance with standard operating procedures
- perform oxyacetylene welding tasks efficiently and to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering
- MEMCOR0191A Use hand tools

Where welds are performed in the overhead position then Unit MEMFAB0072A (Perform advanced welding using oxyacetylene welding process) should be selected.

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S guidelines and regulations
- metal properties and classification
- heating medium/techniques
- welding techniques
- welding processes
- oxy-fuel equipment identification, transportation and storage
- hand tools and equipment
- materials /consumables relative to oxyacetylene welding procedures
- materials preparation
- manual handling and lifting
- measurement
- drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use oxyacetylene welding equipment
- identify/select material
- identify/select welding processes
- handle material, tools and equipment
- measure relative to welding soldering processes
- identify/select materials relative to the welding process
- prepare materials relative to the welding process
- weld using oxyacetylene process efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMFAB0111A: Perform basic welding using manual metal arc welding process (MMAW)

Competency Descriptor: This unit deals with the skills and knowledge required to effectively perform welding using basic manual arc welding processes and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Prepare materials for welding	1.1 Weld requirements are identified from specifications and/or drawings.
	1.2 Material is correctly prepared using appropriate tools and techniques.
	1.3 Materials are assembled/aligned to specification where required.
2. Select welding machine settings and electrodes	2.1 Welding machine and electrodes are identified against pre determined welding procedures and specifications and/or technical drawings.
3. Assemble and set up welding equipment	3.1 Welding equipment is assembled and set up safely and correctly in accordance with standard operating procedures.
	3.2 Test runs undertaken and verified in accordance with specifications.
4. Identify distortion prevention measures	4.1 Distortion prevention measures are identified.
	4.2 Appropriate action taken to minimise and rectify distortion.
5. Weld materials by correct process to quality described in General Purpose or equivalent	5.1 Welds are deposited correctly in flat, horizontal and vertical can position and to specifications.
	5.2 Distortion, preventative action taken where required.
	5.3 Joints are cleaned to specifications using correct and appropriate tools and techniques.

6.	Inspect welds	6.1	Weld joints are visually inspected against specifications.
		6.2	Weld defects are identified.
7.	Correct faults	7.1	Defects are removed with minimum loss of sound metal using correct and appropriate techniques and tools.

RANGE STATEMENT

Manual metal arc welding (MMAW) would be carried out using a range of material for heavy or light fabrication.

Materials used may include carbon steel Material:
- low carbon steel plate up to 10 gauge
- low carbon steel plate up to 7mm
- steel and galvanised pipes up to 50mm

Hand tools to include:

- chipping hammer
- ball pein hammer
- wire brushes
- measuring tape
- steel rule
- files
- cold chisels
- tin snips
- centre punch
- scriber
- pliers
- adjustable wrenches
- allen keys
- vice grips
- slip joint pliers
- vice grip clamp
- divider
- compass
- screwdrivers

Protective clothing and equipment:

- safety boots
- coverall
- goggles
- dust mask
- safety helmet
- leggings
- welding helmet

Work activities may include:

- measuring
- marking
- cutting
- filing
- levelling
- hammering
- squaring
- straightening metal

Preparation of materials may include:

- preheating
- setting up of jigs
- fixtures
- clamps etc.

Welding machines:

- AC and DC arc welding plant - electrical and portable engine driven

Joint preparation:

- lap joints
- vee joints
- butt joints
- tee joints

Location/condition:

- workshops
- plants
- in the field
- confined spaces
- elevated positions
- damp and wet situations

Weld procedures may include

- amperage setting
- earthing
- electrode flux condition etc.

Machine attachments:

- welding leads
- grounding clamp
- electrode holder

Condition for satisfactory weld:

- pre-heating
- arc strike/travel/length
- electrode angle
- arc dynamic/electrical stability

Welding type may include:

- fillet weld
- lap weld
- butt weld

Welding position may include:

- flat
- vertical up and down horizontal

The person would work under supervision or within a team environment using predetermined standards of quality, safety, work and welding procedures and the skills applied to a range of fabrication activities.

Remedial action using thermal processes may include oxyacetylene and air arc equipment.

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the manual metal arc welding all process or other competencies requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to perform manual arc and/or gas metal arc welding in the flat, horizontal and vertical position and to specifications.
- demonstrate correct procedures in setting up and shutting down manual arc welding equipment
- communicate information about tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMC0R0171A Use graduated measuring devices
- MEMCOR0081A Mark off/out (general engineering
- MEMCOR0091A Draw and interpret sketches and technical drawings
- MEMCOR0191A Use hand tools

Where welding is carried out in the overhead position, then UnitMEMFAB0042A (Perform advanced welding using manual metal arc welding process (MMAW), should also be selected.

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- metal classification
- welding technique
- welding processes
- manual welding equipment identification, transportation and storage
- hand tools and equipment
- materials /consumables relative to perform routine manual arc and/or gas metal arc welding
- manual handling and lifting
- measurement
- drawings, sketches and instructions

Skills
The ability to:

- work safely to instructions
- communicate effectively
- interpret related drawings and instructions
- use power tools and hand tools
- identify/select material
- identify/select welding processes
- handle material, tools and equipment
- measure relative to welding processes
- identify/select materials relative to manual arc and/or gas metal arc welding
- perform manual arc and/or gas metal arc welding

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0071A: Use electrical/electronic measuring devices

Competency Descriptor: This unit deals with the skills and knowledge required to perform electrical/electronic measurement using appropriate measuring devices in the metal, engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Use electro-measuring devices to measure variables	1.1	Appropriate device or equipment and setting are selected to achieve required outcome.
		1.2	Appropriate connections are made to achieve required outcome according to standard operating procedure.
		1.3	Readings are obtained and interpreted correctly and conversion into the units of measurement made where necessary.
2.	Maintain electro devices	2.1	Routine care and storage of devices undertaken to manufacturer's specifications or standard operating procedures.

RANGE STATEMENT

This unit applies to electrical/electronic measurements on AC and DC circuits up to 1000v, using appropriate measuring devices. Electrical/electronic measuring devices may require the connection or disconnection of circuitry. Adjustment of measuring devices may include zero and linear adjustment. Work may be undertaken under supervision or as part of a team.

Measurement may include not limited to:

- voltage
- current
- frequency
- resistance
- power
- temperature

Measuring devices may include but not limited to:

- analogue/digital multimeters
- tong testers
- oscilloscopes
- potentiometers
- digital devices

EVIDENCE GUIDE

Competency is to be demonstrated by the effective use of comparison and basic measuring devices in accordance with the range listed in the range of variables statement, relevant to the work orientation.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the taking of electrical/electronic measurements or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to mmeasure and calculate manually
- demonstrate the ability to operate electrical/electronic measuring devices
- demonstrate the ability to rrecord measurement
- take responsibility for the quality of their own work
- perform all related tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

For simple measurement tasks such as reading of fixed devices, testing continuity, and tasks requiring the use of devices mounted in measuring jigs etc. Unit MEMCRI0051A (Measure with graduated devices) and/or Unit MEMCOR0041A (Use comparison and basic measuring devices) should be considered.

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- comparison measurements
- comparison devices
- comparative measurements
- measuring devices
- electrical/electronic measurements
- drawings and specifications
- reading
- writing English
- basic numeracy

Skills
The ability to:

- work safely to instructions
- use power tools and hand tools
- select equipment
- apply quality assurance
- read and interpret drawings and specifications
- measure and calculate manually
- record measurement
- operate electronic measurement calculating devices

(4) Resource Implications

The candidate will be provided with:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to.

- Answer questions put by the assessor
- Identify colleagues who can be approached for the collection of competency evidence where appropriate
- Present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Evidence of competence may be obtained through a variety of methods including:

- observation
- oral questioning
- examination of assessee's portfolio/CV
- supporting statement from section engineer, supervisor or equivalent
- examples of related activities to which applicant has contributed, or worked on
- training courses on material related to range of variables and or knowledge requirement.
- examples of authenticated assessments and/or assignments from formal education courses
- simulation

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working undersupervision or as part of a team.

The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0101A: Evacuate and dehydrate refrigeration systems

Competency Descriptor: This unit deals with the skills and knowledge required to effectively evacuate and dehydrate refrigeration systems and applies to all individuals working in the metal, engineering and maintenance industry.

Competency Field: Metal Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Assess refrigeration system operation	1.1 Basic refrigeration system operating principles and terminology are understood.
	1.2 All relevant information is obtained and correctly interpreted prior to the commencement of work on the refrigeration system.
	1.3 Refrigeration system checks are undertaken safely in accordance with standard operating procedures.
	1.4 Pressures and temperatures are correctly determined and recorded.
	1.5 The refrigeration system is checked for current operating condition.
2. Reclaim refrigerant and evacuate system	2.1 Equipment selected for use is appropriate for the evacuation method to be applied.
	2.2 Connections between the testing apparatus and the system are correctly located, sound and leak proof.
	2.3 The refrigeration system is evacuated in accordance with standard operating procedures, codes and regulations.
	2.4 Measurements taken during the process are carefully analysed and recorded as required.
	2.5 The refrigerant evacuated from the refrigeration system is contained/disposed of in accordance with the relevant codes and regulations.

3.	Clean up	3.1 Materials/supplies/equipment are stacked /stored for re-use or disposal.
		3.2 Work area is cleared.
		3.3 Tools and equipment are cleaned and stored in a cool place.
		3.4 Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements and company's operating procedures.

RANGE STATEMENT

Work is undertaken under supervision or in a team environment using predetermined standards of safety, quality and workshop procedures.

Refrigeration systems may be associated with refrigeration and air conditioning applications including commercial, industrial and transport.

All work is to be undertaken in accordance with all relevant standard and regulatory requirements. Refrigerants include CFCs, HFCs, ammonia, etc.

Tools and equipment may include;

- vacuum pump
- high vacuum gauge
- recovery machine
- moisture indicator
- recovery/recycling machine

Working activities may include:

- connect manifold and gauges
- evacuate system to desired micron reading
- perform standing vacuum

Methods may include:

- triple vacuum method
- deep vacuum method

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively evacuating and dehydrating refrigeration system in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate the ability to set up tool and equipment to evacuate system
- demonstrate correct procedures in evacuating and dehydrating refrigeration system
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies/equipment
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

MEMCOR0171A	Use graduated measuring devices
MEMCOR0091A	Draw and interpret sketches and simple drawings
MEMCOR0191A	Use hand tools
MEMCOR0011A	Use power tools
MEMMRD0081A	Remove, dismantle assemble and replace basic engineering components

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic tools/equipment for evacuating and dehydrating refrigeration system
- standard characteristics of basic refrigeration system components
- standard evacuating and dehydrating methods
- standard refrigeration system components
- standard operational test for refrigeration system
- manufacturers standard specification
- standard application/ refrigeration system
- reading
- writing basic English basic numeracy

Skills
The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- select correct equipment/tools
- apply quality assurance
- perform evacuating and dehydrating of refrigeration system

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMMRD0111A: Carry out routine servicing of coils, filters and room air conditioners

Competency Descriptor: This unit deals with the skills and knowledge required to effectively carry out routine servicing of coils, filters and room air conditioners and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Undertake preventive maintenance checks on domestic air conditioning/refrigeration equipment	1.1	Visual inspection is carried out according to refrigeration/air conditioning principles, procedures and safety requirements.
		1.2	Preventative maintenance tasks are performed under supervision and in accordance to manufacturers' specifications using refrigeration/air conditioning techniques/practices.
		1.3	Equipment components identified correctly.
		1.4	The characteristics and operation of basic component is understood.
2.	Carry out routine servicing of coils	2.1	All joints in the piping connections to the coil are checked for tightness and leakage.
		2.2	All return bends and other joints in the makeup of the coil are checked for leakage.
		2.3	Leaks found are promptly reported to the appropriate personnel.
		2.4	Coils are cleaned according to the maintenance schedule and by an appropriate means.
3.	Carry out routine servicing of filters	3.1	Dirty cells/filters are thoroughly washed, allowed to dry, and properly treated before reuse.

		3.2 Oil used to treat the cells/filters is appropriate.
		3.3 Cells/filters designed for hose cleaning are maintained according to the manufacturer's recommendations
		3.4 Filters are treated as specified in the maintenance procedures.
4.	Carry out routine servicing of room air conditioners	4.1 Unit is removed carefully and is not damaged in the process.
		4.2 All safety precautions are observed during cleaning of the unit.
		4.3 Airflow through the unit is not restricted.
		4.4 Filters and coils are kept clean during the operating season.
		4.5 The refrigerant charge is monitored, and leaks detected are promptly reported to the appropriate personnel.
		4.6 The drip pan of the unit, coils, and fan blades are all cleaned according to the requirements of the maintenance schedule.
		4.7 Fan motors are checked for free turning, and service cord and connections are examined as required.
5.	Report faulty domestic refrigeration/air conditioning components	5.1 Faulty components found during servicing are identified, confirmed by inspection and are promptly reported to the appropriate personnel.
6.	Return to service domestic refrigeration/air conditioning equipment	6.1 Components are reassembled and tested for correct operation and assessed against specification.
		6.2 Correct operation of the equipment is verified using domestic refrigeration/air conditioning principles and system application techniques.
		6.3 Maintenance records/service reports are completed by appropriate designated means.
7.	Clean up	7.1 Materials/supplies/equipment are stacked /stored for re-use or disposal.

7.2 Work area is cleared.

7.3 Tools and equipment are cleaned and stored in a cool place.

7.4 Waste is disposed of using appropriate method according to National Environmental Protection Agency (NEPA) requirements and company's operating procedures.

RANGE STATEMENT

This unit applies servicing of domestic and light commercial refrigeration and air conditioning equipment and components.

Work is carried out under supervision or in a team environment.

Interpret drawings and diagrams of refrigeration and air conditioning equipment, and identify basic components of air conditioning system.

Types of room air conditioners:

- window
- floor or console

Work activities:

- disconnect and remove unit
- clean all coils
- clean condensate drains and check for easy run off
- clean filters
- check for noise or excessive vibration on unit
- check sight glass
- check thermostats
- record motor voltages
- tighten electrical connections
- check fan blades
- check for refrigerant leaks

Means of cleaning:

- mechanical
- chemical

Types of filters:

- cell type where the filtering medium is thrown away
- cell type where the medium is cleaned cell by cell and reused
- continuous-cleaning type
- electrostatic filter

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively perform routine servicing of coils, filters and room conditioners in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to undertaking task
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate the ability to set up tool and equipment to service components
- demonstrate correct procedures in servicing coils
- demonstrate correct procedures in servicing filters
- demonstrate correct procedures in room air conditioners
- give particular attention to safety and elimination of hazards
- demonstrate safe handling/storage of material/supplies/equipment
- interactively communicate with others to ensure safe operations
- demonstrate effective engineering techniques to produce designed outcome

(2) Pre-requisite Relationship of Units

- MEMCOR0171A Use graduated measuring devices
- MEMCOR0071A Use electrical/electronic measuring devices
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0191A Use hand tools
- MEMCOR011A Use power tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- Occupational Health and Safety regulations
- basic tools/equipment for servicing of coils, filters and room conditioners
- principle of refrigeration and air-conditioning
- sensible and latent heat
- the concept of energy and types of energy
- principle of heat conversion
- the concept of heat and methods of heat transfer
- types of refrigeration and air-conditioning systems
- manufacturers standard specification
- standard application/ refrigeration system
- reading
- writing basic English
- basic numeracy

Skills
The ability to:

- follow safely to instructions
- use hand tools
- handle materials
- identify components
- apply quality assurance
- perform routine servicing of coils, filters and room conditioners

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job, or a combination of both. The competencies covered by this unit would be assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMINS0061A: Prepare for piping and tubing installation

Competency Descriptor: This unit deals with the skills and knowledge required to effectively prepare the process for carrying out installation of piping and tubing and applies to individuals working in metal engineering and maintenance industry.

Competency Field: Metal Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan for installation process	1.1 Quality Assurance requirements of engineering /maintenance operations are recognized and adhered to.
	1.2 Preparation and planning requirements are identified from drawings/work location and/or supervisor's instructions.
	1.3 OH&S requirements are identified and adhered to in accordance with application tasks and workplace environment.
	1.4 Safety hazards are identified and correct procedures adopted to minimise risk to self and others.
	1.5 Materials are selected according to supervisor's instructions, safely handled and stored for application.
	1.6 Appropriate personal protective equipment are selected, correctly fitted and used.
	1.7 Tools and equipment selected is consistent with the job requirements.
	1.8 Tools and equipment is checked for serviceability and any faults reported to supervisor
	1.9 Materials/components selected are consistent with the job requirements and checked for damage.
2. Prepare materials selected for installation process	2.1 Activities for material preparation are identified from specifications or supervisor's instructions.
	2.2 Material preparation is carried out to satisfy requirements of installation process.

3.	Prepare work area suitable for installation process	3.1	Activities to be carried out in work area are identified from installation technique, method of installation and access to area.
		3.2	Work area is prepared for installation process according to supervisor's instructions.
4.	Use tools, plant and equipment appropriate for installation process	4.1	Regular tools/measuring devices are suitable for application and process identified.
		4.2	Regular tools/measuring devices are used safely and effectively to carry out processes where applicable.
5.	Prepare background of surfaces/environment for piping and tubing installation	5.1	Surfaces/environment are identified for preparation.
		5.2	Surface where appropriate is chassed/chopped/prepared.
		5.3	Excavations are carried out where appropriate.
6.	Select materials and cut components	6.1	Materials are obtained as per instruction.
		6.2	Correct manual handling techniques are used to move and place materials.
		6.3	Materials are safely moved to work area.
		6.4	Appropriate techniques used to accurately cut/bent/fabricate/secure components to same length and to given instruction.
7.	Distribute components	7.1	Components are distributed and stacked to suit job location and sequence.
8.	Clean up	8.1	Materials are stacked/stored for re-use or disposed of.
		8.2	Work area is cleared.
		8.3	Tools and equipment are cleaned, maintained and stored.

RANGE STATEMENT

This unit applies to the preparation processes carried out in preparing for the installation of piping and tubing as per instructions.

Background surfaces for installation of piping and tubing include but not limited to:

- concrete
- concrete block work
- brickwork/stonework
- pavements
- underground

Installation process includes:

- preparation of pipes and tubing
- preparation of surfaces
- finish of surfaces
- workplace preparation

Personal protective equipment may include:

- overalls
- waterproof pants and jacket
- boots
- water (rubber) boots
- gloves
- dust masks/respirators
- hard hat/cap
- safety goggles

Working conditions may include but are not limited to:

- domestic/commercial new and existing
- at height as per industry standards
- in confined space
- temperature variation
- damp and wet conditions
- indoors and out doors

Tools and equipment to include:

- hand and power hack saws
- stock dies
- pipe threading machine
- pipe wrenches
- pipe cutters
- cold chisels
- soldering and brazing equipment
- wenches
- tube cutter
- flaring tool
- screwdrivers
- shovels
- pickaxes
- hand drills
- pipe reamers
- swaging tools
- files
- heavy duty hammer drill
- hammers

Identification and application of tools for:

- marking out
- measuring
- cutting
- shaping
- drilling
- installing
- threading
- tapping
- finishing
- dismantling
- assembling
- reaming

Fabrication techniques may include but not limited to:

- marking out
- cutting
- bending
- clamping
- plugging
- drilling/punching
- screwing/bolting
- cutting mitres
- adhesion
- threading

Representative range of applications may include such things as

- fixtures
- equipment
- valves
- regulators
- metering devices

Installation techniques:

- surface mount
- underground
- PVC piping
- metal
- on masonry
- on steel
- in pavements
- with clamps
- with saddles
- on/in walls
- in floors
- overhead
- access ways
- wood

Work is to be undertaken either as part of a team or individually, under supervision with instruction being as part of the supervisor's directions either verbal or written.

Reporting of faults may be verbal or written.

OH&S requirements to be in accordance with the regulations.

EVIDENCE GUIDE

Competency is to be demonstrated by carrying out the safe and effective preparation for piping and tubing installation in accordance with performance criteria using any of the range of materials and processes listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- demonstrate the ability to prepare for piping and tubing installation
- demonstrate the ability to apply appropriate principles/techniques to installation environment
- indicate compliance with organisational policies and procedures including Quality Assurance requirements
- demonstrate the ability to carry out specific measurement and preparation procedures
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- use accepted engineering techniques, practices, processes and workplace procedures.
- carry out correct procedures prior to and during application of installation processes
- demonstrate safe and effective operational use of tools, measuring devices and equipment
- interactively communicate with others to ensure safe and effective workplace operations

(2) Pre-requisite Relationship of Units

- MEMCRI0021A (Apply principles of Occupational Health and safety (OH&S) in work environment)
- MEMCRI0071A (Use hand tools)

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements
- drawings and specifications
- measuring devices
- hand tools and equipment
- materials relative to installation process
- materials handling
- measurement relative to installation process
- installation techniques consistent with piping and tubing installation
- workplace communications

Skills
The ability to:

- work safely to instructions
- use hand tools
- use measuring devices
- handle material
- select material
- communicate effectively
- measure relative to process
- prepare for piping and tubing installation

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activity

(6) Context of Assessment

Competency should be assessed in the workplace or simulated workplace environment in accordance with work practices and safety procedures.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMASY0071A: Assemble pipes and fittings for clients

Competency Descriptor: This unit deals with the skills and knowledge required to effectively assemble pipes and fittings and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Read and understand job sheets	1.1	Job sheets/instruction are correctly interpreted and followed.
2.	Select and use pipe cutting and assembly tools	2.1	Tools are correctly selected and used.
3.	Select and use pipes, tools and fittings assembly equipment	3.1	Assembly equipment is selected in accordance with instructions on job sheet.
		3.2	Equipment is used in a safe manner according to standard operating procedure.
4.	Assemble fabrications	4.1	Assembly is produced following correct sequence of operations
		4.2	Assemblies/fabrications/fittings are joined according to specification using appropriate techniques.
		4.3	Assembly is tested/checked for compliance with job sheet requirements using standard operating procedures.
5.	Protect assembly from damage	5.1	Assemblies/fabrications/fittings are handled and stored in a safe manner least likely to cause damage using standard operating procedures.

RANGE STATEMENT

This unit recognises the commonality of skills and knowledge that exists for the unit as well as the additional specific outcome; which is to be reported on. Therefore, competency can be displayed on one, some or all of the following categories and in addition to the respective common underpinning knowledge associated with the selected specialisation.

Work processes may include but not limited to:

- identifying and selecting materials, fixtures and supplies
- identifying and selecting tools and equipment
- identifying and selecting pipes and fittings
- measuring, cutting and preparing plastic pipes for joining
- applying solvent cement weld to plastic pipes and fittings and joining pipes
- cleaning tools and work area
- preparing pipe ends for installation
- installing valves, regulators and metering devices
- positioning and installing kitchen/bath room fixtures plumbing fixtures
- soldering copper pipe fittings
- measuring and cutting steel pipes
- threading steel pipes
- joining steel/copper pipes
- welding steel/copper pipes
- brazing steel/copper pipes
- testing pipe joints
- excavating trenches
- chasing, boring and drilling concrete
- roughen-in pipe-work
- erecting and/or installing piers brackets and other supports
- flaring copper tubes

Preparation of materials would be minimal and may include but not limited to:

- preheating
- setting up jigs,
- setting up fixtures
- setting up clamps
- cleaning up material
- joint preparation

Location/condition may include but not limited to:

- workshops
- domestic complexes
- plants and commercial complexes
- in the field
- confined spaces
- elevated positions
- damp and wet situations
- on wall surfaces

Roughen-in may include but not limited to:

- kitchen fixtures
- bathroom fixtures
- laundry equipment
- specified chemical systems
- compressed air line
- specified steam line
- farming complex

Joining of pipes may be done by but not limited to:

- screwed method
- welding
- brazing
- soldering
- flanged method
- compression method
- solvent weld – (P.V.C cement)
- seaming
- bonding
- riveting

Tools and equipment may include but not limited to:

- hand and power saws
- pipe cutters
- threading machine
- pipe reamers
- pipe dies/taps
- tape measure
- jigs and fixtures
- ladders/scaffolding
- welding/brazing/soldering equipment
- masonry tools
- hammers/screwdrivers/hand tools
- hand brush
- pipe bending spring
- pipe vices/wrenches/tripod/benders

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively assembly pipes and fittings in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

It is essential that competence be observed in the following aspects:

- demonstrate compliance with Occupational Health and Safety regulations applicable to workplace operations
- show compliance with organizational policies and procedures including Quality Assurance requirements
- adopt and carry out correct procedures prior to assembling pipes and fittings and during the process
- demonstrate safe and effective operational use of tools, plant and equipment
- demonstrate correct procedures in assembling pipes and fittings
- give particular attention to safety and elimination of hazards
- demonstrate safe handling of material
- interactively communicate with others to ensure safe operations
- demonstrate effective skills to produce designed outcome

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the assembly of pipes and fittings or other units requiring the exercise of the skills and knowledge covered by this unit.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMFAB0041A Carry out mechanical cutting operations - (basic)
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0191A Use hand tools
- MEMCOR0111A Use power tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- assembly methods
- assemble equipment
- hand tools and equipment
- jigs, fixtures, tools and measuring equipment relative to repairing, replacing and modifying fabrications
- materials preparation
- manual handling
- measurement
- drawings, sketches and instructions
- types and use of tools

Skills
The ability to:

- work safely to instructions
- plan to undertake a routine assembly task
- interpret relative drawings and instructions
- select and use tools and fittings related to assembly process
- select pipes and fixtures for the assembly process
- measure relative to the assembly processes
- communicate effectively
- assemble pipes and fittings efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify supervisors/colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

This unit may be assessed on the job, off the job or a combination of both. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMINS0041A: Install & maintain piping & tubing

Competency Descriptor: This unit deals with the skills and knowledge required to effectively Install and terminate piping and tubing associated with domestic plumbing installation systems or other related area in the metal, engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for installation	1.1 Installation is planned and prepared to ensure OH&S policies and procedures are followed.
	1.2 The work is appropriately sequenced in accordance with requirements
	1.3 Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved on the work site.
	1.4 Piping, and tubing is checked against job requirements.
	1.5 Piping and tubing is obtained in accordance with established procedures and to comply with requirements.
	1.6 Location in which piping and tubing is to be installed is determined from job requirements.
	1.7 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements.
	1.8 Tools, equipment and testing devices needed to carry out the installation work are obtained in accordance with established procedures and checked for correct operation and safety.
	1.9 Preparatory work is checked to ensure no unnecessary damage has occurred and complies with requirements.
2. Install piping and tubing	2.1 OH&S policies and procedures for installing piping and tubing are followed.
	2.2 Piping and tubing are installed in accordance with requirements, without damage or distortion to the surrounding environment or services.

		2.3	Piping and tubing are terminated and connected in accordance with requirements.
		2.4	Unplanned events or conditions are responded to in accordance with established procedures.
.		2.5	Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are implemented.
		2.6	On-going checks of the quality of the work are undertaken in accordance with established procedures.
3.	Test for leaks	3.1	Leaks are tested for using appropriate devices and procedures.
4.	Inspect and notify completion of work	4.1	Final inspections are undertaken to ensure the installed piping and tubing conforms to requirements.
		4.2	Work completion is notified in accordance with established procedures.

RANGE STATEMENT

This unit recognises the commonality of skills and knowledge that exists for the unit as well as the additional specific outcome; which is to be reported on. Therefore, competency can be displayed on one, some or all of the following categories and in addition to the respective common underpinning knowledge associated with the selected specialisation.

In order to maintain currency in this unit on-going competency development is to occur. This would include keeping abreast of any changes in regulations, procedures, technology and the like related to the scope and application of this unit

Use identification and application of tools for

- marking out
- measuring
- cutting
- shaping
- drilling
- brazing
- threading
- tapping
- finishing
- dismantling/assembling
- flaring
- soldering

Fabrication techniques may include but not limited to:

- marking out
- cutting
- bending
- flaring
- brazing
- drilling
- punching
- soldering
- cutting mitres
- welding

Representative range of applications may include such things as:

- water supply
- steam
- air
- oil
- refrigeration
- other fluids
- equipment
- tools
- accessories
- components

Installation techniques:

- surface mount
- in wall
- underground/overhead
- in floorings/in ceilings

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively install and maintain piping and tubing for domestic plumbing installations in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

Achievement of this unit of competence is based on each of the following conditions being met:

- demonstrating consistent performance for each element of the unit in the related category and specialisation which is to be exhibited across a representative range of applications; under supervision and to requirements.
- meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace for each of the categories and areas of specialisation undertaken from those listed in the Range statement or Evidence guide.
- demonstrating an understanding of the underpinning knowledge and skills identified for the categories and related specialisation undertaken in the section, of this unit titled 'Underpinning knowledge'.

During assessment the individual will:

- demonstrate safe working practices at all times;
- demonstrate the ability to install and maintain piping
- communicate information about processes, events or tasks being undertaken to ensure a safe and efficient working environment;
- take responsibility for the quality of their own work;
- perform all tasks in accordance with standard installation and maintenance procedures;
- perform all related tasks to specification;
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMCOR0141A Apply principles of occupational health and safety (OH&S) in work environment
- MEMCOR0161A Plan and undertake a routine task
- MEMCOR0171A Use graduated measuring devices
- MEMFAB0041A Carry out mechanical cutting
- MEMFAB0051A Perform brazing and/or silver soldering
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0191A Use hand tools
- MEMCOR0111A Use power tools

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- safety and work procedures:
- standards of quality
- installation tools and equipment
- materials used in installation
- materials used for piping and fittings
- fabrication techniques
- installation techniques
- maintenance techniques for different materials and nature of work
- assembly/disassembly techniques
- leak detection techniques
- types of joining compounds

Skills
The ability to:

- identify potential workplace hazards; preventative measures
- work with tools and equipment
- read and interpret simple freehand sketches
- measure accurately
- communicate effectively
- install and maintain piping and tubing efficiently

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- Identify supervisors/colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both on and off the job in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manage process • Select the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

ITICOR0011A: Carry out data entry and retrieval procedures

Competency Descriptor: This unit deals with the skills and knowledge required to operate computer to enter, manipulate and retrieve data and to access information and communicate via the Internet.

Competency Field: Information Technology and Communications - Operations

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Initiate computer system	1.1	Equipment and work environment are correctly checked for readiness to perform scheduled tasks.
		1.2	The hardware components of the computer and their functions are correctly identified.
		1.3	Equipment is powered up correctly.
		1.4	Access codes are correctly applied.
		1.5	Appropriate software is selected or loaded from the menu.
2.	Enter data	2.1	Types of data for entry correctly identified and collected.
		2.2	Input devices selected and used are appropriate for the intended operations.
		2.3	Manipulative procedures of Input device conform to established practices.
		2.4	Keyboard/mouse is operated within the designated speed and accuracy requirements.
		2.5	Computer files are correctly located or new files are created, named and saved.
		2.6	Data is accurately entered in the appropriate files using specified procedure and format.
		2.7	Data entered is validated in accordance with specified procedures.
		2.8	Anomalous results are corrected or reported in accordance with specified procedures.
		2.9	Back-up made in accordance with operating procedures.

3.	Retrieve data	3.1	The identity and source of information is established.
		3.2	Authority to access data is obtained where required.
		3.3	Files and data are correctly located and accessed.
		3.4	Integrity and confidentiality of data are maintained.
		3.5	The relevant reports or information retrieved using approved procedure.
		3.6	Formats to retrieved report or information conform to that required.
		3.7	Copy of the data is printed where required.
4.	Amend data	4.1	Source of data/information for amendment is established.
		4.2	Data to be amended is correctly located within the file.
		4.3	The correct data/Information is entered, changed or deleted using appropriate input device and approved procedures.
		4.4	The Integrity of data is maintained.
5.	Use document layout and data format facilities	5.1	Requirements for document are verified where necessary.
		5.2	The given format and layout are appropriately applied.
		5.3	Facilities to achieve the desired format and layout are correctly identified, accessed and used.
		5.4	Data manipulating facilities are used correctly.
		5.5	Format reflects accuracy and completeness.
6.	Monitor the operation of equipment	6.1	The system is monitored to ensure correct operation of tasks.
		6.2	Routine system messages are promptly and correctly dealt with.
		6.3	Non-routine messages are promptly referred in accordance with operating requirements.

		6.4	Error conditions within level of authority are dealt with promptly, and uncorrected errors are promptly reported.
		6.5	Output devices and materials are monitored for quality.
7.	Access and transmit information via the Internet	7.1	Access to the Internet is gained in accordance with the provider's operating procedures.
		7.2	Evidence of the ability to negotiate web sites to locate and access specified information and other services is efficiently demonstrated.
		7.3	E-Mail is sent and retrieved competently.
8.	Close down computer system	8.1	The correct shut down sequence is followed.
		8.2	Problem with shutting down computer is reported promptly.
		8.3	All safety and protective procedures are observed.
		8.4	The system integrity and security are preserved.
9.	Maintain computer equipment	9.1	Cleaning materials and/or solutions used meet specified recommendation.
		9.2	The equipment is cleaned as directed.
		9.3	Wear and faults identified are promptly reported to the appropriate personnel.

RANGE STATEMENT

This unit applies to activities associated with essential operations linked to using and maintaining basic computer equipment.

Equipment:

- install supplied computer
- install supplied peripherals

Work environment:

- equipment
- furniture
- cabling
- power supply

Input devices:

- keyboard
- mouse
- scanner
- microphone
- camera

Software systems to include for:

- word processing
- spread sheet
- internet access

Files save on:

- network
- magnetic media
- personal PC

Data:

- textual
- numerical
- graphical

File operations:

Naming, updating, archiving, traversing field and records in database, use of search, sort, print

Maintenance:

- cleaning: enclosures, screen, input devices, output devices
- checking cables, etc

EVIDENCE GUIDE

Competency is to be demonstrated by the ability to accurately carry out basic data entry and retrieva l operations on a computer system in accordance with the performance criteria and the range listed within the range of variables statement .

(1) Critical Aspects and Evidence

It is essential that competence be observed in the following aspects:

- Initiate the use on the equipment.
- Use document layout and data format facilities.
- Locate and access data.
- Use file operations.
- Manipulate input devices.
- Key-in and format reports.
- Access to the internet.

(2) Pre-requisite Relationship of Units

The pre-requisite for this unit is:

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
knowledge of:

- safety for working with and around computers
- computer hardware and software systems
- procedure for initiating and closing down computer
- the operation of the data entry management system
- methods of locating files
- organisation's standards applicable to accessing files
- files operations and their applications
- file operation in database setting
- creating, locating and saving files
- using input devices
- using data checking devices
- formatting functions of software
- layout function of software
- graphic productions and manipulation
- regard for accuracy and security of information
- functions on the internet

Skills
The ability to:

- identify computer hardware
- manipulate data input devices
- access data
- use file operations
- key-in and format reports and letters
- retrieve data
- amend data
- print data
- save data
- search and receive data from the internet
- send and receive E-Mail

(4) Resource Implications

Files saved on network, magnetic media, personal Computer

Input devices: Keyboard, mouse, other selection devices

(5) Method of Assessment

Competency shall be assessed while work is undertaken under direct supervision with regular checks, but may include some autonomy when working as part of a team.

Competencies in this unit may be determined concurrently. Assessment must be in accordance with the performance criteria.

(6) Context of Assessment

This unit may be assessed on or off the job. Assessment should include practical demonstration either in the workplace or through a simulation. A range of methods to assess underpinning knowledge should support this

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level -	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level -	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMCOR0101A: Prepare basic engineering drawing

Competency Descriptor: This unit deals with the skills and knowledge required to effectively prepare basic engineering drawing, and applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Identify drawing requirements	1.1	Requirements and purpose of drawing are determined from customer and/or work specification and associated documents.
		1.2	Identified and collected all data necessary to produce the drawing.
		1.3	Drawing requirements are confirmed with relevant personnel and timeframes for completion established.
2.	Prepare or make changes to engineering drawing	2.1	Drafting equipment selected are appropriate to the drawing method chosen.
		2.2	Drafting principles is applied to produce a drawing that is consistent with standard operating procedures within the enterprise.
		2.3	All work safely is undertaken to prescribed procedure
		2.4	Completed drawing is approved in accordance with standard operating procedures.
3.	Prepare engineering parts list	3.1	Components and parts are identified and organised by component type and/or in accordance with organisation/customer requirements.
4.	Issue drawing	4.1	Completed drawings and or parts lists are in accordance with standard operating procedures.
		4.2	Copied/issued approved drawings and or parts lists to relevant personnel in accordance with standard operating procedures.
		4.3	Approved drawings and or parts lists are stored and catalogued in accordance with standard operating procedures.

RANGE STATEMENT

This unit applies to any of the full range of engineering disciplines;

- mechanical
- electrical/electronic
- fabrication

Consultations may include reference to appropriate personnel including

- technical supervisory
- manufacturers
- suppliers
- contractors
- customers

Drawing records may include

- cataloguing
- issuing security classifications
- filing
- preparing
- distribution lists
- drawings

Specifications may be obtained from

- design information
- customer deals/concepts/expectations/requirements
- sketches
- preliminary layouts

Copies may be issued as:

- hard copy
- photographic
- slide or transparency form
- presentation
- a single drawing and/or
- with other drawings
- support documentation as a package

Drawing instruments and supplies:

- drafting kit/instruments
- blue prints
- drawings/modules/photographs

Geometric construction to include:

- circles
- regular polygons with four, seven and eight sides
- pentagon inscribed within measured circle
- ellipse
- triangles with specified angles
- arcs thru three points; tangent to two circles

Alphabet of line:

- object line
- hidden line
- centre line
- section line
- dimension
- extension line
- cutting line
- short break line
- phantom line

Multi-view (orthographic 2-D) drawings:

- full scale (1:1) orthographic 3-view drawing using third angle projection with top, front and right side view – show all hidden features and center lines

Pictorial (3-D) drawing to include:

- isometric corner with left and right side lines each 30 degrees up from horizontal and third line at a vertical, with all three lines joining in a common intersection
- full scale (1:1) basic isometric drawing

Dimension reading:

- dimensioning styles and methods: co-ordinate, linear/datum
- dimensioning 2-D drawing
- dimensioning complex shapes: spheres, cylinders, tapers, pyramids

EVIDENCE GUIDE

Competency is to be demonstrated by developing and effectively preparing basic engineering drawings in accordance with the performance criteria and the range listed within the range statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the preparation of basic engineering drawings or other units requiring the exercise of the skills and knowledge covered by this unit.

It is essential that competence is observed in the following aspects:

- prepare and understand various types of drawings
- prepare alphabet of lines, scales, lettering, dimensions, symbols, abbreviations and key features
- prepare title panel and reference date of drawings
- prepare basic engineering drawings

(2) Pre-requisite Relationship of Units

- MEMCOR0091A Draw and interpret sketches and simple drawings

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- types and use of drawing instruments and supplies
- identification of alphabet of lines, line type variation, order of usage and application on drawings
- types of scale and proportion and how they are used for measurement
- symbols, dimensions and terminology
- types of engineering drawings and their applications
- constructing plane geometry, loci and ellipse

Skills
The ability to:

- estimate measurements
- read and interpret working drawings
- prepare basic engineering drawing
- measure accurately
- communicate effectively

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency should be assessed in a classroom environment in accordance with work practices and safety procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyze and organize information	Level 1	
Communicate ideas and information	Level 1	
Plan and organize activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills

MEMINS0182A: Install valves, regulators and metering devices

Competency Descriptor: This unit deals with the skills and knowledge required to effectively install valves regulators and metering devices associated with refrigeration, plumbing and air conditioning systems or other related area in the metal, engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA	
1. Plan and prepare for installation	1.1	Installation is planned and prepared to ensure OH&S policies and procedures are followed.
	1.2	The work is appropriately sequenced in accordance with requirements.
	1.3	Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved on the work site.
	1.4	Pipework are checked against job requirements.
	1.5	Pipework are obtained in accordance with established procedures and to comply with requirements.
	1.6	Location in which valves, regulators or metering devices are to be installed is determined from job requirements.
	1.7	Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements.
	1.8	Tools, equipment and testing devices needed to carry out the installation work are obtained in accordance with established procedures.
	1.8	Tools, equipment and testing devices are checked for correct operation and safety.
	1.9	Preparatory work is checked to ensure no unnecessary damage has occurred and complies with requirements.

2.	Install valves, regulators and metering devices	2.1	OH&S policies and procedures for installing pipework are followed.
		2.2	Valves, regulators or metering devices are installed in accordance with requirements, without causing damage or distortion to the surrounding environment or services.
		2.3	Pipework are terminated and connected in accordance with requirements.
		2.4	Unplanned events or conditions are responded to in accordance with established procedures.
.		2.5	Approval is obtained in accordance with established procedures from appropriate personnel before any contingencies are implemented.
		2.6	On-going checks of the quality of the work are undertaken in accordance with established procedures.
		2.7	Work is completed within acceptable time.
3.	Test system	3.1	Correct testing procedures are used
4.	Clean up area	4.1	All waste material is removed and dispose of.
		4.2	Area related to work activities is cleaned.
		4.3	Tools and equipment are cleaned, maintained and stored.
5.	Inspect and notify completion of work	5.1	Final inspections are undertaken to ensure the installed valves, regulators and metering devices conforms to requirements.
		5.2	Work completion is notified in accordance with established procedures.

RANGE STATEMENT

This unit recognises the commonality of skills and knowledge that exists for the unit as well as the additional specific outcome; which is to be reported on. Therefore, competency can be displayed on one, some or all of the following categories and in addition to the respective common underpinning knowledge associated with the selected specialisation.

In order to maintain currency in this unit on-going competency development is to occur. This would include keeping abreast of any changes in standards, regulations, procedures, technology and the like related to the scope and application of this unit

Source of information:

- Working drawings/sketches
- Oral/written work instructions

Locations/conditions:

- trenches
- confined spaces
- elevated positions
- hot cold
- damp and wet situations

Plumbing systems:

- hot and cold water
- chemicals
- steam
- compressed air
- hydrants - fire lines

Devices:

- Valves
- Regulators and metering devices for hot and cold water
- Chemicals steam
- Compressed air

Tools and equipment to include:

- hand and power hack saws
- pipe dies
- pipe threading machine
- pipe wrenches
- pipe cutters
- wenches
- screwdrivers
- masonry trowel
- shovels
- cold chisels
-

- pickaxes
- hand drills
- pipe reamers
- swaging tools
- files
- flaring tool
- tube cutters
- hammers
- soldering and brazing equipment
-

Materials and supplies:

- range of pipes/tubing and fittings – steel
- copper
- iron
- plastic
- brass alloys up to 100mm
- gate valves
- globe valve
-

Valves, regulatory and metering devices:

- butterfly
- saunders valve
- pressure relief
- safety valve
- pressure gauges
- check valves
- ball valves
- float valves

Safety:

- personal and public safety
- machine power and hand tool safety

Appropriate personnel:

- apprentices
- supervisor

Work processes:

- reading and interpreting drawings and other relevant information
- determining and organizing job requirements
- identifying and selecting tools and equipment
- preparing pipe ends for installation
- installing valve, regulators and metering devices to pipe-work installations
- install testing devices

EVIDENCE GUIDE

This Evidence guide is intended to include components defined within the Range statement

(1) Critical Aspects of Evidence

Achievement of this unit of competence is based on each of the following conditions being met:

- demonstrating consistent performance for each element of the unit in the related category and specialisation which is to be exhibited across a representative range of applications; autonomously and to requirements.
- meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace for each of the categories and areas of specialisation undertaken from those listed in the Range statement or Evidence guide.
- demonstrating an understanding of the underpinning knowledge and skills identified for the categories and related specialisation undertaken in the section, of this unit titled 'Underpinning knowledge'.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to install valves regulators and metering devices
- communicate information about tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMINS0061A Prepare for piping and tubing installation
- MEMASY0071A Assemble pipes and fittings for clients
- MEMINS0041A Install and maintain piping and tubing for clients

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- safety and work procedures:
- standards of quality
- installation tools and equipment
- installation techniques
- valves regulatory and metering devices
- use and selection of appropriate tools, materials and supplies

Skills
The ability to:

- handle ladders
- identify potential workplace hazards; preventative measures
- work with hand and power tools
- read and interpret sketches drawings manuals etc.
- measure accurately
- communicate effectively
- install valves, regulators and metering devices appropriately
- test system to ensure valves are functional and being installed properly

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to:

- answer questions put by the assessor.
- identify supervisors/colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 2	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

MEMINS0232A: Prepare material and locations for installing drains and waste systems

Competency Descriptor: This unit deals with the skills and knowledge required to effectively prepare material and locations for installing drains and waste systems as applies to individuals working in the metal engineering and maintenance industry.

Competency Field: Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare for installation	1.1 Work instructions/information are accurately interpreted and the task is organized accordingly.
	1.2 The correct size, type and quantity of material, components and location are selected and prepared.
	1.3 Material are located and stored according to the installation specifications/work instructions.
	1.4 Instructions/information communicated to appropriate personnel are confirmed as understood.
	1.5 Materials are not damaged and where deficiencies are observed appropriate corrective action is taken.
	1.6 Where required, materials and components are assembled according to specifications/instructions
	1.7 All connections are mechanically sound and water tight.
2. Prepare materials, components and locations	2.1 Material, components and waste system location are accurately located, correctly identified and are proved suitable for preparation.
	2.2 Where material, components and waste system location prove unsuitable, the appropriate action is taken.
	2.3 Where defects/potential dangers affect the achievements of the installation objectives, appropriate action is taken
	2.4 Disturbance/damage to building fabric and/or structure is minimized.

		2.5	Tools and equipment selected are appropriate for the intended task.
		2.6	Work is carried out in accordance with health, safety and codes of practice.
3.	Test equipment	3.1	Correct testing procedures are used.
4.	Clean up area	4.1	All waste material are removed and disposed of.
		4.2	Work area related to work activities is cleaned.
		4.3	Tools and equipment are cleaned, maintained and stored.
5.	Inspect and notify completion of work	5.1	Final inspections are undertaken to ensure the installed equipment, conforms to requirements.
		5.2	Work completion is notified in accordance with established procedures.

RANGE STATEMENT

This unit recognises the commonality of skills and knowledge that exists for the unit as well as the additional specific outcome; which is to be reported on. Therefore, competency can be displayed on one, some or all of the following categories and in addition to the respective common underpinning knowledge associated with the selected specialisation.

Source of information:

- working drawings/sketches
- manufacturer's technical information
- statutory regulations
- oral/written work instructions

Corrective action:

- replacing defective/non-match materials/
- reporting deviation to supervisor

Tools and equipment:

- appropriate hand tools
- power tools
- equipment for digging trenches
- ladder
- scaffolding

Materials and components:

- sand
- cement
- aggregate
- bedding materials

Method of digging:

- use of hand tools and power tools

Range of pipes up to 200 mm in diameter to include earthen:

- plastic,
- copper
- cast-iron
- pre-cast concrete
- cast-iron chambers and manholes.

Safety:

- manual handling,
- material handling,
- machine operating procedures,
- personal safety,
- ladder and scaffolding safety.
- trench digging

Protective clothing:

- safety boots,
- safety helmet
- coverall,
- goggles
- gloves

Work activities:

- identifying and selecting tools and equipment
- excavating and timbering trenches
- grading and bedding trenches
- erecting and/or installing manholes and chambers
- erecting and/or installing piers, brackets and other supports
- excavation of walls and floor

EVIDENCE GUIDE

(1) Critical Aspects of Evidence

Achievement of this unit of competence is based on each of the following conditions being met:

- demonstrating consistent performance for each element of the unit in the related category and specialisation which is to be exhibited across a representative range of applications; autonomously and to requirements.
- meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace for each of the categories and areas of specialisation undertaken from those listed in the Range statement or Evidence guide.
- demonstrating an understanding of the underpinning knowledge and skills identified for the categories and related specialisation undertaken in the section, of this unit titled 'Underpinning knowledge'.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to prepare material and locations for installing drains and waste systems
- communicate information about processes, tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- plan tasks in all situations and review task requirements as appropriate
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

- MEMINS0061A Prepare for piping and tubing installation
- MEMASY0071A Assemble pipes and fittings for clients
- MEMINS0041A Install and maintain piping and tubing for clients

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- standards of quality
- installation tools and equipment
- materials and components related to systems
- installation techniques
- range of plumbing draining systems
- range of plumbing waste systems
- use and selection of appropriate tools, materials and supplies

Skills
The ability to:

- handle ladders
- identify potential workplace hazards; preventative measures
- work with hand tools
- read and interpret sketches drawings manuals etc.
- measure accurately
- communicate effectively
- install plumbing equipment appropriately
- test system to ensure equipment are functional and being installed properly

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required.
- any relevant workplace procedures.
- any relevant product and manufacturing specifications.
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication,

- answer questions put by the assessor.
- identify supervisors/colleagues who can be approached for the collection of competency evidence where appropriate.
- present evidence of credit for any off-job training related to this unit.

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities

(6) Context of Assessment

Competency shall be assessed on the job, off the job or a combination of both in accordance with workplace procedures

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical employable skills.

MEMMRD0072A: Shut down/isolate machine/equipment

Competency Descriptor: This unit deals with skills and knowledge required to shut down/isolate machines/equipment and applies to individuals working in the metal engineering and maintenance trades.

Competency Field: Metal, engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Shut down machine/equipment	1.1 Machine/equipment operation and function are determined and understood.
	1.2 Shut down sequence is undertaken safely and to standard operating procedures.
	1.3 Machine/equipment are de-pressured/emptied/de-energised bled to standard operating procedures.
	1.4 Safe shut down of machine/equipment is verified.
	1.5 Safety/security lock off devices and signage are installed to standard operating procedure.
	1.6 Machine/equipment is left in clean and safe state.
2. Isolate machine/equipment	2.1 Machine/equipment operation and function are determined and understood.
	2.2 Isolation methods and points are recognised and identified.
	2.3 Isolation is undertaken safely and to standard operating procedures.
	2.4 Safe isolation of machine/equipment is verified.
	2.5 Safety/security lock off devices and signage are installed to standard operating procedure.
	2.6 Machine/equipment are left in clean and safe state.

RANGE STATEMENT

Shut down/isolation is undertaken autonomously or as part of team.

Machines/equipment range includes manual, semi automatic and automatic machines of a stand alone, continuous production or process nature.

Shut down/isolation means and includes isolation of mechanical, electrical drives, pipe-work (pressure) rotating equipment etc.

Shut down/isolation utilises electrical lock off isolators, mechanical and power driven valves etc. Relevant regulations, Standards and legislative requirements governing isolation and shutdown are complied with.

This unit requires system knowledge that excludes the straightforward starting/stopping of machinery/equipment through the use of simple switching, including use of emergency switches.

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively shutting down/isolating machines/equipment in accordance with the range listed within the range of variables statement.

(1) Critical Aspects of Evidence

This unit could be assessed in conjunction with any other units addressing the safety, quality, communication, materials handling, recording and reporting associated with the isolation and shut down of machines and equipment or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to shut down/isolate machines equipment effectively
- communicate information about tasks being undertaken to ensure a safe and efficient working environment
- take responsibility for the quality of their own work
- perform all tasks in accordance with standard operating procedures
- perform all tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMCOR0131A Undertake interactive workplace communication)
- MEMCOR0141A Follow principles of occupational health and safety (OH&S) in work environment
- MEMOR0161A Plan and undertake a routine task

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- workplace and equipment safety requirements including relevant OH&S legislation and regulations
- drawings, sketches and instructions
- machines/equipment range includes manual, semi automatic and automatic machines of a stand alone, continuous production or process nature
- equipment/machine systems being shut down/isolated
- basic electrical principles
- basic mechanical drives systems
- electrical lock off isolators
- mechanical and power driven valves etc.
- relevant regulations, standards and legislative requirements governing isolation and shutdown

Skills
The ability to:

- work safely to instructions
- communicate effectively
- interpret relative drawings and instructions
- shut down/isolate machines equipment

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant product and manufacturing specifications
- any relevant codes, standards, manuals and reference materials

(5) Method of Assessment

The candidate will be required to orally, or by other methods of communication:

- answer questions put by the assessor
- identify colleagues who can be approached for the collection of competency evidence where appropriate
- present evidence of credit for any off-job training related to this unit

Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge.

Tasks involved will be completed within reasonable timeframes relating to typical workplace activities.

(6) Context of Assessment

This unit should be assessed on the job. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. The assessment environment should not disadvantage the candidate.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualification Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1.	Level 2.	Level 3.
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 2	
Communicate ideas and information	Level 2	
Plan and organise activities	Level 2	
Work with others and in team	Level 2	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 2	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.

BSBSBM0012A: Craft personal entrepreneurial strategy

Competency Descriptor: This unit deals with the skills and knowledge required to craft an entrepreneurial strategy that fits with the attitudes, behaviours, management competencies and experience necessary for entrepreneurs to meet the requirements and demands of a specific opportunity.

Competency Field: Small Business Operations

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Demonstrate knowledge of the nature of entrepreneurship	1.1 Concepts associated with entrepreneurship are clearly defined.
	1.2 Factors which influence entrepreneurship in and outside of Jamaica are correctly identified and explained.
	1.3 The importance of entrepreneurship to economic development and employment is explained clearly.
	1.4 The findings of research conducted on entrepreneurial ventures and successes in the Caribbean region are clearly presented in an appropriate format.
	1.5 Differences between wage employment and entrepreneurial ventures are correctly stated.
2. Identify and assess entrepreneurial characteristics	2.1 Relevant research is carried out and required entrepreneurial characteristics identified.
	2.2 Entrepreneurial characteristics identified are assessed and ranked.
	2.3 An understanding of the process and discipline that enable an individual to evaluate and shape choices and to initiate effective action is correctly demonstrated.
	2.4 Factors that will help an entrepreneur to manage the risk and uncertainties of the future, while maintaining a future orientated frame of mind, are identified.

3.	Develop self-assessment profile	3.1	Self-assessment tools/methods to identify personal entrepreneurial potential are identified and properly used.
		3.2	The ability to apply creativity, problem-solving techniques and principles to solve business related problems are demonstrated.
		3.3	Feedback from others for the purpose of becoming aware of blind spots and for reinforcing or changing existing perceptions of strengths/ weaknesses is appropriately obtained.
4.	Craft an entrepreneurial strategy	4.1	A profile of the past that includes accomplishments and preferences in terms of life and work styles, coupled with a look into the future and an identification of what one would like to do is developed.
		4.2	Commitment, determination and perseverance; orientation towards goals; taking initiative and accepting personal responsibility; recognizing management competencies and identifying areas for development are determined.
		4.3	Written guidelines to obtain feedback that is solicited, honest, straightforward, and helpful but not all positive or negative are developed to facilitate reviews.
		4.4	Framework and process for setting goals which demand time, self-discipline, commitment, dedication and practice are developed.
		4.5	Goals established are specific and concrete, measurable, relate to time, realistic and attainable.
		4.6	Priorities, including identifying conflicts and trade-offs and how these may be resolved are established.
		4.7	Potential problems, obstacles and risks in meeting goals are identified.
		4.8	Specified action steps that are to be performed in order to accomplish goals are identified.
		4.9	The method by which results will be measured is indicated.

4.10 Milestones for reviewing progress and tying these to specific dates on a calendar are established.

4.11 Sources of help to obtain resources are identified.

4.12 Evidence of the ability to review process and periodically revise goals is demonstrated.

RANGE STATEMENT

At this stage of the entrepreneurial process the entrepreneur must be able to conduct a self-assessment profile, examine the frame work for self assessment, develop a personal entrepreneurial strategy, identify data to be collected in the self-assessment process and learn about receiving feedback and setting goals.

Concepts associated to include:

- risk
- entrepreneurship
- macro-screening
- micro-screening
- competition
- wage employment

Influencing factors to include:

- market conditions
- markets – demand/supply
- global trends
- level of economic activities
- funding
- economic stability
- social stability
- resources availability

The entrepreneur must be able to:

- understand the extreme complexity in predicting or aligning him/herself to specific careers in an environment of constant change
- determine the kind of entrepreneur he or she wants to become based on attitudes, behaviours, competencies, experience and how these fit with the requirements and demands for a specific opportunity
- evaluate thoroughly his or her attraction to entrepreneurship
- effectively develop personal plan
- utilize available information that will enhance his or her ability to achieve success

The entrepreneur may encounter setbacks if the planning process is not effectively pursued.

Pitfalls may include:

- proceeding without effective planning which may result in commitment to uncertainty
- commitment to a premature path with the desirability of flexibility can lead to disaster
- personal plans fail for the same reasons as business plans including frustration if the plan appears not to be working immediately and the challenges of changing behaviour from an activity-oriented routine to one that is goal oriented
- developing plans that fail to anticipate obstacles, and those that lack progress milestones and reviews

EVIDENCE GUIDE

Competency is to be demonstrated when the entrepreneur is able to undertake a personal entrepreneurial assessment exercise to determine if he or she possesses the necessary credentials to be a successful entrepreneur. This stage of the entrepreneurial process is critical since experience has shown that the founder is one of the deciding forces if the venture is to succeed and prosper.

(1) Critical Aspects of Evidence

The entrepreneur will be assessed by his/her action in developing an orchestrated plan in order to effectively pursue the business concept.

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- personal entrepreneurial profile systems
- effective management systems: marketing, operations/productions, finance, administration, law
- how to measure feedback
- the method of developing a personal plan
  and a business plan
- understanding the difference between entrepreneurial culture and management culture

Skills
The ability to:

- determine barriers to entrepreneurship
- minimize exposure to risk
- exploit any available resource pool
- tailor reward systems to meet a particular situation
- effectively plan and execute activities
- use computer technology to undertake assessments

(4) Resource Implications

The following resources should be made available:

Personal computer with access to the internet and appropriate software that will enable one to conduct the necessary analysis using the internet

(5) Method of Assessment

A useful method of assessment is to determine if the venture can stand up to the test of critical evaluation.

(6) Context of Assessment

This stage of the entrepreneurial process is assessed when comparisons are made between actual outcomes and plans/projections.

CRITICAL EMPLOYABILITY SKILLS

Three levels of performance denote level of competency required to perform a task. These levels do not relate to the NCTVET Qualifications Framework. They relate to the seven areas of generic competency that underpin effective workplace practices.

Levels of Competency		
Level 1	Level 2	Level 3
• Carries out established processes • Makes judgement of quality using given criteria	• Manages process • Selects the criteria for the evaluation process	• Establishes principles and procedures • Evaluates and reshapes process • Establishes criteria for evaluation

Collect, analyse and organise information	Level 1	
Communicate ideas and information	Level 1	
Plan and organise activities	Level 1	
Work with others and in team	Level 1	
Use mathematical ideas and techniques	Level 1	
Solve problems	Level 1	
Use technology	Level 1	

Please refer to the Assessment Guidelines for advice on how to use the Critical Employability Skills.