

Competency Standards for Caribbean Vocational Qualifications (CVQ)

CCMEM11002

Level I in Electrical Installation

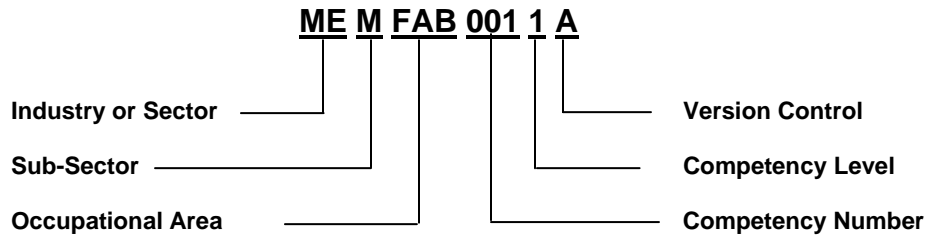
Unit Number	Unit Title	Mandatory /Elective	Hours
MEMCOR0131A	Undertake interactive workplace communication	Mandatory	20
MEMCOR0141A	Follow principles of Occupational Health and Safety (OH&S) in work environment	Mandatory	20
MEMCOR0161A	Plan to undertake a routine task	Mandatory	10
MEMCOR0171A	Use graduated measuring devices	Mandatory	10
MEMCOR0191A	Use hand tools	Mandatory	5
MEMCOR0051A	Perform related computations – BasicD	Mandatory	42
MEMCOR0071A	Use Electrical/Electronic measuring devices	Mandatory	10
MEMCOR0081A	Mark off/out (general engineering)	Mandatory	10
MEMCOR0091A	Draw and interpret sketches and simple drawings	Mandatory	20
MEMMAH0071A	Perform manual handling and lifting	Mandatory	5
MEMMAH0081A	Perform housekeeping duties	Mandatory	10
MEMINS0071A	Prepare for electrical conduits/wiring installation	Mandatory	20
MEMINS0051A	Cut, bend and install electrical conduit	Mandatory	20
MEMINS0011A	Install, terminate and connect electrical wiring	Mandatory	20
MEMMRD0161A	Disconnect and reconnect fixed wired electrical machinery, appliances and fixtures	Mandatory	20
MEMMRD0181A	Attach flexible cables & plugs to electrical machinery appliances and fixtures	Mandatory	20
MEMFAB0011A	Perform manual soldering/de-soldering – electrical/electronic components	Mandatory	15
MEMMRD0121A	Perform basic repair to electrical/electronic apparatus	Elective	40
MEMMRD0091A	Terminate signal and data cables - BasicD	Elective	20
ITICOR0011A	Carry out data entry and retrieval procedures	Elective	20
MEMFAB0041A	Carry out mechanical cutting operations – (basic)	Elective	10
MEMCOR0101A	Prepare basic engineering drawing	Elective	30
MEMCOR0121A	Classify engineering materials – (basic)	Elective	30
MEMCOR0042A	Interpret standard specifications and manuals	Elective	5
MEMINS0162A	Cut, fit and install trunking system	Elective	10
BSBSBM0012A	Craft personal entrepreneurial strategy	Elective	20
MEMINS0172A	Prepare and install basic cable trays	Elective	10

To be awarded this Caribbean Vocational Qualification (CVQ) all Mandatory 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: MEMFAB0011A



**KEY: Man – Mandatory; FAB – Fabrication; MAH – Machine Handling; INS – Installation;
MRD – Maintenance Repairs & Diagnostic; BSB – Business Services (Industry);
SBM – Small Business Management (Sub-Sector) 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 SkillsKnowledge

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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	<p>1.1 Work is carried out safely and in accordance with company policy and company procedures and industry requirements.</p> <p>1.2 Housekeeping is undertaken in accordance with company procedures.</p> <p>1.3 Responsibilities and duties of employees are understood and demonstrated in day-to-day actions.</p> <p>1.4 Personal protective equipment is worn and stored according to company procedures.</p> <p>1.5 All equipment and safety devices are used according to legislative requirements and company/matrix manufacturer's procedures/instructions.</p> <p>1.6 Safety signs/symbols are identified and followed as per instruction.</p> <p>1.7 All manual handling is carried out in accordance with Industry requirements, company procedures and National Occupational Health & Safety guidelines.</p> <p>1.8 Occupational Health & Safety Commission guidelines demonstrated.</p>
2. Report workplace hazards	<p>2.1 Workplace hazards identified during the course of work are reported to appropriate person according to standard operating procedures/factory act.</p>

- | | | | |
|----|-----------------------------|-----|--|
| 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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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 SkillsKnowledge

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.
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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.

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

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 SkillsKnowledge

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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 SkillsKnowledge

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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 measure and calculate manually
- demonstrate the ability to operate electrical/electronic measuring devices
- demonstrate the ability to record 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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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 SkillsKnowledge

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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: coordinate, 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 SkillsKnowledge

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

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|----|--|-----|--|
| 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 SkillsKnowledge

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
- OHS 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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

MEMINS0071A: Prepare for electrical conduits/wiring installation

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively prepare for the installation of electrical conduits/wiring 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	<p>1.1 Quality Assurance requirements of engineering /maintenance operations are recognized and adhered to.</p> <p>1.2 Preparation and planning requirements are identified from drawings/work location and/or supervisor's instructions.</p> <p>1.3 OH&S requirements identified and adhered to in accordance with application tasks and workplace environment.</p> <p>1.4 Safety hazards are identified and correct procedures adopted to minimise risk to self and others.</p> <p>1.5 Materials are selected according to supervisor's instructions</p> <p>1.6 Appropriate personal protective equipment selected, correctly fitted and used.</p> <p>1.7 Tools and equipment selected consistent with the job requirements,</p> <p>1.8 Tools and equipment are checked for serviceability and any faults reported to supervisor.</p> <p>1.9 Fixtures/components selected consistent with the job requirements where applicable and checked for damage.</p>
2. Prepare materials selected for installation process	<p>2.1 Activities for material preparation are identified from specifications or supervisor's instructions.</p> <p>2.2 Material preparation is carried out to satisfy requirements of installation process.</p>

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|----|--|-----|--|
| 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 suitable for application processes are identified to job requirements. |
| | | 4.2 | Correct tools/measuring devices are used safely and effectively to carry out processes where applicable. |
| 5. | Prepare background of surfaces/environment for electrical conduits/wiring installation | 5.1 | Surfaces/environment are identified for preparation. |
| | | 5.2 | Surface where appropriate is chassed/chopped/prepared. |
| | | 5.3 | Excavations where appropriate are carried out. |
| 6. | Handle material | 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 | Techniques used to accurately cut/bent/fabricate/secure components to same length or to given instruction. |
| 7. | Store material | 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 electrical conduits/wiring as per instructions.

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
- concreting

Representative range of applications may include such things as:

- apparatus
- wiring systems
- plant,
- plugs
- lighting and switch boxes
- transfer boxes
- equipment
- power tools
- accessories
- components
- meter panels
- draw boxes
- distribution panels

Installation techniques:

- surface mount
- flush mount
- PVC conduits up to 32mm
- PVC trunking
- metal not exceeding 25mm
- on masonry
- on steel
- with clamps
- with saddles
- on walls
- on floors
- on roofs/ceilings
- access ways
- wood
- underground

Tools/equipment to include:

- electric hand drill
- drill bits
- cold chisel & files
- ball peen hammer
- reamers
- benders
- hole saws
- knock out/hole saw
- hack saw
- screwdrivers
- spirit level
- pipe dies
- pipes- PVC/metal
- pipe vices
- ladders
- combination squares

Type of site and working conditions to include

- domestic new and existing
- at height as per industry standards/JS 21
- in confined space
- temperature variation
- damp and wet conditions
- 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 regulations.

EVIDENCE GUIDE

Competency is to be demonstrated by carrying out the safe and effective preparation for electrical conduits/wiring 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
- indicate compliance with organisational policies and procedures including Quality Assurance requirements
- 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

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to prepare for electrical conduits/wiring installation
- demonstrate the ability to apply appropriate principles/techniques to installation 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.

(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 installation process
- materials handling
- measurement relative to installation process
- installation techniques consistent with solid plastering
- 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 conduit/wiring 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 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 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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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.

MEMINS0051A: Cut, bend and install electrical conduit

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively cut, bend and install electrical conduit associated with electrical installation instrumentation, refrigeration, 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 for, 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	Conduits are obtained in accordance with established procedures and comply with requirements.
		1.5	Location in which conduits are to be installed is determined from job requirements.
		1.6	Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements.
		1.7	Tools and equipment needed to carry out the installation work are obtained in accordance with established procedures.
		1.8	Preparatory work is checked to ensure no unnecessary damage has occurred.
2.	Install conduits	2.1	OH&S policies and procedures for installing conduits are followed.
		2.2	Conduits are installed in accordance with requirements, without damage or distortion to the surrounding environment or services.
		2.3	Conduits are terminated and connected in accordance with requirements.

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|----|---------------------------------------|---|
| | 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. | Inspect and notify completion of work | 3.1 Final inspections are undertaken to ensure the installed conduits conforms to requirements. |
| | | 3.2 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 legislation, regulations, procedures, technology and the like related to the scope and application of this unit, JS standards or any approved standards

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
- concreting
-

Representative range of applications may include such things as

- apparatus
- wiring systems
- plant,
- plugs
- lighting and switch boxes
- equipment
- power tools
- accessories
- components
- meter panels
- draw boxes
- distribution panels

Installation techniques:

- surface mount
- flush mount
- PVC conduits up to 32mm
- PVC trunking
- metal not exceeding 25mm
- on masonry
- on steel
- with clamps
- with saddles
- on walls
- on floors
- on roofs
- access ways
- wood

Tools/equipment to include:

- electric hand drill
- drill bits
- cold chisel & files
- ball pein hammer
- reamers
- benders
- hole saws
- hack saw
- screwdrivers
- spirit level
- pipe dies
-

Type of site and working conditions to include

- domestic new and existing
- at height as per industry standards
- in confined space
- temperature variation
- damp and wet conditions
- indoors and out doors
- pipes- PVC/metal
- pipe vices
- ladders
- combination squares

EVIDENCE GUIDE

This Evidence guide is intended to include components defined within the range statement

(1) Critical Aspects of Evidence

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

During assessment the individual will:

- demonstrate safe working practices at all times;
- demonstrate the ability to cut bend and install electrical conduits

- 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 related tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- Nil

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- safety and work procedures:
- JS21 regulations and other relevant codes
- standards of quality
- installation tools and equipment
- materials used in installation
- materials used for conduits
- fabrication techniques
- installation techniques
- assembly/disassembly techniques

Skills

The ability to:

- handle ladders
- identify potential workplace hazards preventative measures
- work with electrically operated tools and equipment
- read and interpret simple freehand sketches
- measure accurately
- communicate effectively
- bend 90⁰, and offsets in conduits
- cut, thread and ream conduits
- install PVC and metal conduits

(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

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

MEMINS0011A: Install, terminate and connect electrical wiring

Competency Descriptor:

This unit deals with the skills and knowledge required to install, terminate and connect electrical wiring applies to individuals working in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Prepare for electrical wiring installation, termination and connection	1.1 All work is undertaken safely and to workplace procedures and standard requirements. 1.2 Materials are checked for correct specifications. 1.3 Preparation of work is undertaken or checked/inspected for correct location and specifications eg: cable trays, brackets, trenches etc.
2. Install electrical wiring	2.1 Installations are made to specifications, manufacturers requirements and to safety and industry regulations 2.2 All conduit, and wiring are fixed to specifications. 2.3 All cables, wires, conductors and installations are marked/tagged and labelled to specification. 2.4 All completed installations are tested for compliance. 2.5 All reports, documentation are completed correctly to required specifications.
3. Connect electrical wiring	3.1 Terminations/connections are made to specifications manufacturers' requirements and to safety and industry requirements. 3.2 All brackets, clamps, holders etc. are adjusted and fixed to specifications. 3.3 All cables, wires, conductors and connections etc. are marked/tagged and labelled to specification

- 3.4 All completed wiring and connections are tested for compliance with specifications.
- 3.5 All reports and documentation are completed correctly to required specifications.

RANGE STATEMENT

This unit applies to installing, joining terminating and connecting electrical wiring. Work generally undertaken as part of team or under supervision. Work is to be undertaken in accordance with relevant regulations and/or legislation. .

Installation may include but not limited to:

- surface mount
- flush mount
- in PVC conduits up to 32mm
- in metal not exceeding 25mm
- using mechanical connectors
- clamping
- pin connection

Termination and connection includes the utilisation of a range of methods including

- plugs sockets
- clamping of cables and wires, sealing entry points where required
- soldered joints
- crimping
-

Types of joint may include:

- twist joints
- straight twist joints
- tee twist joints
- tee joints
- married joints
- straining point joints
- mechanical joints

Tools and equipment to include:

- combination pliers
- long nose pliers
- side cutting pliers
- solder ions
- crimping tools

All testing undertaken on completed circuits using appropriate methods include but not limited to:

- continuity and resistance checks.
- insulation test
- polarity test
- specifications obtained from electrical/electronic circuit drawings and data sheets.

Connection of wiring includes but is not limited to:

- termination and connection of cords
- termination and connection of cables
- excluding specialist cables, of all types, sizes and materials

Electrical services include but not limited to:

- power supplies
- control, wiring
- 0 - 220V ac/dc

EVIDENCE GUIDE

Competency is to be demonstrated by effectively terminating and connecting electrical wiring 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 termination and connection of electrical wiring, or other units requiring the exercise of the skills and knowledge covered by 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.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to select and use appropriate tools and equipment
- demonstrate the ability to terminate and connect electrical wiring
- 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 related tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

Termination and connection of specialist cables such as mineral insulated, steel wire, armoured cables etc, is covered in Unit MEMINS0062A (Terminate and connect specialist cables).

(3) Underpinning Knowledge and Skills

Knowledge
Knowledge of:

- safety and work procedures
- industry standards JS21
- standards of quality
- installation tools and equipment
- materials used in installation
- connection of wiring
- bonding methods
- types of joints
- termination and connection methods
- installation methods

Skills

The ability to:

- work safely to instructions
- select and use appropriate tools and equipment
- use soldering tools and equipment
- handle materials
- select material and supplies
- join electrical wiring
- terminate electrical wiring
- 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 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.

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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.

MEMMRD0161A: Disconnect and reconnect fixed wired electrical machinery, appliances and fixtures

Competency Descriptor:

This unit deals with skills and knowledge required to competently disconnect and reconnect fixed wired electrical machinery appliances and fixtures and applies to individuals in the metal engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY		PERFORMANCE CRITERIA	
1.	Prepare to disconnect electrical equipment	1.1	Disconnection is planned to ensure OH&S policies and procedures are followed.
		1.2	Appropriate personnel are consulted to ensure work is co-ordinated effectively with others involved in the work site.
		1.3	Electrical characteristics of electrical equipment and electrical supply are determined and recorded in accordance with established procedures.
		1.4	The point of isolation of electrical equipment to be disconnected is determined.
		1.5	Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for correct operation and safety.
2.	Disconnect electrical equipment	2.1	OH&S policies and procedures are followed.
		2.2	Electrical equipment is isolated in accordance with established procedures. (see range statement).
		2.3	Conductor connection sequence is recorded and labelled in accordance with established procedures.
		2.4	Electrical equipment is disconnected from fixed wiring without damage to other components.
		2.5	Disconnected conductors/cables are terminated in accordance with requirements to ensure they are safe and present no potential hazard.

3. Prepare to reconnect electrical equipment
 - 3.1 Reconnection is planned to ensure OH&S policies and procedures are followed.
 - 3.2 Appropriate personnel are consulted to ensure work is co-ordinated effectively with others involved in the work site.
 - 3.4 Replacement electrical equipment is selected on the basis of rating and characteristics being the same as that of the original electrical equipment.
 - 3.5 Appropriate personnel are consulted in the event that appropriate replacement electrical equipment is not available.
 - 3.6 Original and/or replacement electrical equipment is tested to ensure it is safe to connect to the electrical supply and use.
 - 3.7 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for correct operation and safety.
4. Reconnect electrical equipment
 - 4.1 OH&S policies and procedures are followed.
 - 4.2 Measurements are taken to ensure circuit to which electrical equipment is to be connected remains isolated in accordance with established standards.
 - 4.3 The continuity of protective earthing conductor is tested to determine whether it is sufficiently low.
 - 4.4 The resistance between the protective earthing conductor and the neutral conductor is tested to determine whether it is sufficiently low.
 - 4.5 The insulation resistance of active conductors is tested to confirm that it is greater than 1M Ω .
 - 4.6 An appropriate qualified person is engaged to rectify any non-compliance condition revealed by the testing.
 - 4.7 Continuity between exposed conductive parts of the electrical equipment and the main earth or metal switchboard enclosure is confirmed.
 - 4.8 Electrical equipment is connected to comply with requirements.

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| | 4.9 | Connections to the electrical equipment are checked to confirm they are correct. |
| 5. | 5.1 | Test the reconnected electrical equipment for safe operation
OH&S policies and procedures, and established procedures for the reinstatement of isolated circuits and electrical equipment are followed. |
| | 5.2 | Arrangements are made with appropriate personnel to test the operation of the electrical equipment. |
| | 5.3 | Operational non-conformances are identified and reported in accordance with established procedures. |
| | 5.4 | Status report(s) are completed and notified in accordance with established procedures. |

RANGE STATEMENT

This unit applies to the disconnecting and reconnecting of fixed wired electrical equipment using engineering principles, tools, equipment and procedures to standard requirements.

The following aspects must be demonstrated:

- prepare to disconnect electrical equipment
- disconnect electrical equipment
- prepare to reconnect electrical equipment
- test the reconnected electrical equipment for safe operation
- provide status reports
- testing to ensure safety, including earth continuity and insulation integrity
- OH&S practice
- determining electrical characteristics of equipment
- identifying point of installation
- isolating equipment
- disconnection techniques
- selecting replacement equipment
- reconnection techniques
- applying techniques, procedures, information and resources relevant to performance

Electrical characteristics refers to:

- voltage
- current rating
- power rating
- direction of rotation
- phase sequence/polarity
- name plates information and duty

Electrical equipment refers to

- composite equipment
- pre-assembled
- control devices
- electrical heaters
- motors
- lighting

EVIDENCE GUIDE

Competency shall be demonstrated in relation to the endorsement for which competency is sought. The following critical aspects of competency shall be demonstrated:

- preparation to disconnect electrical equipment
- disconnecting of electrical equipment
- preparation to reconnect electrical equipment
- reconnection of electrical equipment; and
- testing of the reconnected electrical equipment for safe operation

(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 across a representative range of specified electrical equipment in the scope of work and for which endorsement of competency for the specified electrical equipment is being sought; under supervision and to requirements
- To requirements means meeting all relevant safe working practices, manufacturers specifications, codes of practice, regulatory requirements and industry standards
- meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace for the endorsement sought and scope of work in the Range Statement
- demonstrating an understanding of the underpinning knowledge and skills identified for the scope of work undertaken in the section of this unit titled Underpinning 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.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to disconnect and reconnect fixed wired electrical 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 to return equipment to service

(2) Pre-requisite Relationship of Units

- MEMCOR0141A (Follow principles of Occupational Health and safety (OH&S) in work environment)
- MEMCOR0161A (Plan to undertake a routine task)
- MEMCOR0171A (Use graduated measuring devices)
- MEMCOR0091A Draw and interpret sketches and simple drawings)
- MEMCOR0191A (Use hand tools)
- MEMINS0011A (Terminate and connect electrical wiring)

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- hazards in the (electrical) work environment: shock hazards; fire hazards; chemical hazards
- hazardous areas
- special situations
- procedures for dealing with fires associated with electrical equipment
- procedures for dealing with related situations
- basic electrical circuit(s): source; control; protection; load
- circuit diagrams: symbols; conventions; interpretations; free sketches
- circuit connections and functions: open circuit; closed circuit; short circuit
- basic electrical measurement: use of multimeters; use of ammeter; use of voltage measuring and indicating devices; testing of measuring instruments; care of measuring instruments; voltage, current and resistance measurement; estimating values of voltage, current and resistance; using ohms law
- fundamental electrical concepts: effects of current; practical resistors; sources of emf; simple practical circuit; series, parallel and series-parallel circuits; electrical measurement; capacitors; inductors; magnetism
- insulation resistance measurement and requirements
- earthing principles and systems
- methods for testing insulation resistance; continuity of prospective earthing conductor; continuity between exposed conductive parts and the earthing system

Knowledge

Knowledge of: (cont'd)

- cable types and conductor termination methods and techniques: conductors solid, stranded and flexible; colour codes
- single and three phase systems and loads: number of active and live conductors required; line and phase voltage; typical loads
- general appliances: appliance identification; appliance ratings
- single and three phase induction motors: motor identification; motor ratings; direction of rotation
- single and three phase heaters: types of heaters; heater identification; heater ratings
- electrical distribution arrangement: power systems; within a premises; purpose of switchboards/distribution boards (residual current devices)
- circuit isolation and protection devices
- isolation procedures: work clearance; testing for voltage; lock-off and tagging; techniques, regulation, codes of practice and procedures
- disconnection procedures, practices and requirements
- replacement equipment
- reconnection procedures, practices and requirements

Skills

The ability to:

- work safely to instructions
- use tools and plant
- use of ladders and elevated work platforms
- ensuring equipment is safe to connect to supply
- return equipment to service

(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.

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

MEMMRD0181A: Attach flexible cables & plugs to electrical machinery appliances and fixtures

Competency Descriptor:

This unit deals with skills and knowledge required to competently attach flexible cables & plugs to electrical equipment and fixtures and applies to individuals in the metal, engineering and maintenance industry.

Competency Field:

Metal, Engineering and Maintenance

ELEMENT OF COMPETENCY	PERFORMANCE CRITERIA
1. Plan and prepare to attach flexible cable(s) and plug(s)	<p>1.1 Work is planned and prepared to ensure OH&S policies and procedures are followed, and the work is appropriately sequenced in accordance with requirements.</p> <p>1.2 Condition and ratings under which the flexible cable(s) and plug(s) is to operate is determined from requirements and in consultation with appropriate personnel followed by written instruction.</p> <p>1.3 Flexible cable(s) and plug(s) are selected to comply with standards and requirements for the condition and rating to be determined.</p> <p>1.4 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements.</p> <p>1.5 Tools, equipment and testing devices needed to carry out the work are obtained in accordance with established procedures and checked for correct operation and safety.</p> <p>1.6 Flexible cable(s) is prepared without damage to insulation and conductors and in accordance with requirements.</p>
2. Attach flexible cable(s) and plug(s)	<p>2.1 OH&S policies and procedures are followed.</p> <p>2.2 Single insulated metal-framed equipment is earthed in accordance with requirements.</p> <p>2.3 The integrity of double insulated equipment is maintained in accordance with requirements.</p> <p>2.4 Conductors are connected to terminals in accordance with requirements to ensure the required polarity is affected.</p>

- | | | | |
|----|---|-----|---|
| 3. | Test equipment for operation and safety | 3.1 | Appropriate tests of the cables(s) and plug(s) connected to the electrical equipment are conducted in accordance with requirements and to established procedures to ensure safe installation and operation. |
| 4. | Provide status report(s) | 4.1 | Status report(s) are completed and notified in accordance with established procedures. |

RANGE STATEMENT

This unit applies to the attaching of flexible cable & plugs to electrical equipment using engineering principles, tools, equipment and procedures to regulatory requirements

The following aspects must be demonstrated:

- prepare to disconnect electrical equipment
- disconnect electrical equipment
- prepare to reconnect electrical equipment
- test the reconnected electrical equipment for safe operation
- provide status reports
- testing to ensure safety, including earth continuity and insulation integrity
- OH&S practice
- determining electrical characteristics of equipment
- identifying point of installation
- isolating equipment
- disconnection techniques
- selecting replacement equipment
- reconnection techniques
- applying techniques, procedures, information and resources relevant to performance

Electrical characteristics refers to:

- voltage
- current rating
- power rating
- direction of rotation
- phase sequence/polarity
- name plates information and duty

Electrical equipment refers to:

- composite equipment
- pre-assembled
- control devices
- electrical heaters
- motors
- lighting

EVIDENCE GUIDE

Competency is to be determined on evidence of having consistently performed across a representative range of specified electrical equipment for the endorsement and scope of work for which competency is being sought; autonomously and to requirements.

(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 across a representative range of specified electrical equipment in the scope of work and for which endorsement of competency for the specified electrical equipment is being sought; under supervision and to requirements. To requirements means meeting all relevant safe working practices, manufacturers specifications, codes of practice and regulatory requirements, Standards both Jamaican and International and OH&S Standards
- meeting the performance criteria associated with each element of competence by employing the techniques, procedures, information and resources available in the workplace for the endorsement sought and scope of work in the Range Statement
- demonstrating an understanding of the underpinning knowledge and skills identified for the scope of work undertaken in the section of this unit titled Underpinning 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

During assessment the individual will:

- Demonstrate safe working practices at all times
- Demonstrate the ability to attach flexible cable & plugs to electrical equipment to 1,000 Vac/1,500 Vdc
- 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
- Plan tasks in all situations and review task requirements as appropriate
- Perform all tasks in accordance with standard operating procedures
- Perform all related 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 to undertake a routine task)
- MEMCOR0171A (Use graduated measuring devices)
- MEMCOR0091A (Draw and interpret sketches and simple drawings)
- MEMCOR0191A (Use hand tools)
- MEMINS0011A (Terminate and connect electrical wiring)

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- hazards in the (electrical) work environment: shock hazards; fire hazards; chemical hazards
- procedures for dealing with fires associated with electrical equipment
- procedures for dealing with PCBs
- fundamental electrical concepts: current; voltage; resistance
- circuit isolation and protection devices
- isolation procedures: work clearance; testing for voltage; lock-off and tagging; techniques, regulation, codes of practice and procedures Up to 1,000Volts A.C./1,500Volts D.C.
- appliance/electrical equipment applications:
- basic principles of appliance/electrical equipment (non mathematical); appliance/electrical
- equipment identification; appliance/electrical equipment ratings;
- basic principles of operation of control equipment and protection devices; fault conditions and symptoms;
- test equipment;
- safe testing procedure, including continuity; fault types in appliances/electrical equipment; fault-finding procedures (prescriptive)
- circuit connections and functions: open circuit; closed circuit; short circuit
- basic voltage, current and resistance measurement and calculation
- insulation resistance measurement and requirements
- cable types and conductor termination methods and techniques:
- colour codes
- cable ratings Up to 1,000Volts A.C. 1,500Volts D.C. flexible cords/cables for use with single phase appliances/apparatus:
- types and loading
- service duty Up to 1,000Volts A.C. 1,500Volts D.C.
- plugs for use with single phase applications/apparatus:
- types and loading;
- IP rating
- continuity testing
- connection requirements and techniques
- safety testing

Skills

The ability to:

- work safely to instructions
- use tools and plant
- use of ladders and elevated work platforms
- ensuring equipment is safe to connect to supply
- return equipment to service
- position and fix fixtures in place
- connect wires to terminals, plugs and electrical 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

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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.

MEMFAB0011A: Perform manual soldering/de-soldering – electrical/electronic components

Competency Descriptor:

This unit deals with the skills and knowledge required to perform manual soldering/de-soldering – electrical/electronic 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. Prepare materials for soldering	1.1 Materials preparation instructions understood and followed. 1.2 Materials are prepared using correct soldering tools, equipment, materials and procedures. 1.3 Materials are prepared to specifications using instruction or standard operating procedures.
2. Solder materials	2.1 Correct soldering techniques, procedures, materials and soldering tools is selected. 2.2 Materials are jointed, mounted and shaped to specification using standard operating procedures. 2.3 Solder is applied using correct and appropriate techniques. 2.4 Where appropriate, excess material is removed using correct and appropriate tools and techniques. 2.5 Procedures for the protection of components are observed according to standard operating procedure.
3. Inspect solder joints	3.1 Inspection procedure is undertaken to standard operating procedures. 3.2 Inspection results are reported/recorded to standard operating procedures as required.
4. Undertake de-soldering	4.1 Correct and appropriate techniques, procedures, de-soldering tools and equipment are selected. 4.2 Materials/components are de-soldered using correct procedure minimising damage to materials, components. 4.3 Material/device are removed and cleaned to specifications using standard operating procedures.

RANGE STATEMENT

This unit covers manual soldering/de-soldering for the installation and fabrication of electrical/electronic components. Work undertaken in a production or maintenance environment using predetermined standards of quality, safety and work procedures. Component protection procedures are predetermined. All materials and procedures specified via job instructions. All work undertaken to standard requirements.

Correct and appropriate soldering tools and equipment may include but not limited to:

- all types of soldering irons
- cutters
- brushes,
- files
- soldering tips
- solder syringes
- holding devices

Correct and appropriate materials may include but not limited to:

- solder (solid resin core and paste)
- flux (resin or powder)

Inspections carried out using with pre set-up equipment which may include but not limited to:

- visual
 - mechanical
 - electric techniques
-

EVIDENCE GUIDE

Competency is to be demonstrated by effectively performing manual soldering/de-soldering of electrical/electronic components 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 manual soldering and de-soldering or other competencies requiring the exercise of the skills and knowledge covered by this unit. This unit could be assessed in conjunction with any other units

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.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to use soldering tools and equipment
- demonstrate the ability to manual soldering/de-soldering – electrical/electronic components efficiently
- 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 related tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures.

(2) Pre-requisite Relationship of Units

Unit MEMCOR0191A (Use hand tools)

Where soldering and de-soldering is limited to the straightforward termination, disconnection or reconnection of electrical wiring then see Unit MEMINS0011A (Terminate and connect electrical wiring).

Advanced specification and high reliability soldering associated with the installation of electrical/electronic components, in areas where reliability of connections is critical, is covered by Unit MEMFAB0012A (High reliability soldering and de-soldering).

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- standards of quality
- safety and work procedures
- soldering tools and equipment
- material used in soldering
- procedures via job instructions
- inspections used in soldering operations
- electrical/electronic components for soldering
- regulatory requirements

Skills

The ability to:

- safely to instructions
- select appropriate tools equipment and supplies
- use soldering tools and equipment
- handle materials
- select material
- apply quality assurance
- manual soldering/de-soldering – electrical/electronic components 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

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

MEMMRD0121A: Perform basic repair to electrical/electronic apparatus

Competency Descriptor:

This unit deals with the skills and knowledge required to undertake basic repairs to electrical/electronic apparatus by following routines described in work instructions or apparatus manuals, 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 work to carry out basic repair	1.1 Repair work is prepared to ensure OH&S policies and procedures are followed. 1.2 Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved. 1.3 Given maintenance schedules and specifications are checked against requirements. 1.4 Materials needed to complete the work are obtained in accordance with established procedures. 1.5 Tools and testing devices needed to carry out the work are checked for correct operation and safety.
2. Carry out basic repair work	2.1 OH&S policies and procedures are followed. 2.2 Circuits are checked as being isolated where necessary using specified testing procedures. 2.3 Apparatus is repaired in accordance with established procedures and repair routines. 2.4 On-going checks of the quality of the work are undertaken in accordance with established procedures.
3. Inspect and notify completion of work	3.1 Final inspections are undertaken to ensure the repair of apparatus conforms to given requirements. 3.2 Work completion is notified in accordance with established procedures.

RANGE STATEMENT

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. Candidate should be able to effect basic repairs to any one of the following systems

- computer systems
- electrical appliance
- electronics appliance
- refrigeration and air conditioning control systems
- data communications systems

Appliance and apparatus may include:

- electrical fans
- vacuum cleaners
- food mixers and food blenders
- electric irons
- modular appliances
- electric toasters and toaster ovens
- microwave ovens
- gas appliances/apparatus
- household/freezing apparatus
- dish washers
- laundry equipment
- ranges and ovens

Basic repairs may include:

- repairs to wiring systems
- repairs to circuits
- repairs to components
- removal and replacement of components
- removal and replacement of printed circuit boards
- installation and set up of system components
- using test equipment to locate and isolate causes of problems
- cleaning and restoring unit to specification
- repairing broken appliances cases

EVIDENCE GUIDE

Competency will be demonstrated by having consistently performed across a representative range of applications which includes such things as apparatus, circuits, wiring systems, plant, equipment, tools, accessories, components and the like relative to that required for the category undertaken within and relevant to this unit of competence under supervision and to requirements.

(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'

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.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to perform basic repair to electrical/electronic apparatus efficiently
- 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 repair tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMFAB0011A Manual soldering/de-soldering - electrical/electronic components
- MEMCOR0091A Draw and Interpret sketches and simple drawings
- MEMCOR0071A Use Electrical/electronic measuring devices
- MEMCOR0191A Use hand tools

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- safety and work procedures
- safety precautions three wire line plugs, cords and receptacles
- standards of quality
- maintenance schedules and specifications
- tools and testing equipment
- basic testing techniques
- basic electrical test
- basic electronic apparatus
- basic electronic circuits
- basic electronic components
- connection of wiring
- bonding/fixing methods
- appliance connectors
- types of cords, wire sizes and plugs
- termination and connection types
- termination and connection methods
- basic electrical/electronic faults (short circuit, open circuit, defective resistors etc)

Skills

The ability to:

- work safely to instructions
- follow maintenance schedules and specifications
- select and use appropriate tools and equipment
- use tools and testing devices
- handle materials
- select material parts and supplies
- perform basic repair to electrical/electronic apparatus

(4) Resource Implications

The following resources should be made available:

- all tools, equipment, materials and documentation required
- any relevant workplace procedures
- any relevant standard 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

Competency will be determined on evidence of having consistently performed across a representative range of applications which includes such things as apparatus, circuits, wiring systems, plant, equipment, tools, accessories, components and the like relative to that required for the category undertaken within and relevant to this unit of competence, under supervision and to requirements. Equivalent evidence from other sources is also acceptable.

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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.

MEMMRD0091A: Terminate signal and data cables – (basic)

Competency Descriptor:

This unit deals with the skills and knowledge required to terminate signal and data cables 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 mark conductors/cables | 1.1 | Cables and conductors are identified using appropriate technique. |
| | | 1.2 | Cables and conductors are labelled in accordance with specification. |
| 2. | Prepare cable | 2.1 | Termination requirements and specifications are obtained and understood. |
| | | 2.2 | Cable ends are prepared to specifications utilising appropriate tools and techniques. |
| 3. | Terminate cables | 3.1 | Cables are terminated to specifications utilising appropriate tools and techniques. |
| | | 3.2 | Terminations are tested/examined for compliance with specifications utilising appropriate test equipment and techniques. |
| 4. | Fix/secure cables | 4.1 | Cables are fixed/secured in accordance with standard operating procedures and specifications, utilising appropriate fixing/securing techniques. |

RANGE STATEMENT

Work undertaken under supervision or as part of team environment. Work undertaken in field or workshop environment. All work and work practices undertaken to regulatory and standard requirements. This unit covers basic signal and data cables, excluding specialist cables.

Termination techniques may include:

- solder
- crimp
- wire wrap non-insulated and pre-insulated
- connectors
- multi-terminal plugs and sockets
- co-axial
- terminal blocks

Types of cables covered include:

- signal cables;
- communication cables;
- extra low voltage power and control cables

Specifications and procedures are obtained from:

- circuit drawings
- data sheets
- instructions

Fixing and securing include:

- the use of clamps,
- cable ties,
- bolting, screwing

EVIDENCE GUIDE

Competency is to be demonstrated by effectively terminating signal and data cables 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, addressing the safety, quality, communication, materials handling, data cables or other units requiring the exercise of the skills and knowledge covered by this unit. Competency in this unit cannot be claimed until all prerequisite knowledge has been satisfied.

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.

During assessment the individual will:

- demonstrate safe working practices at all times
- demonstrate the ability to select and use appropriate tools and equipment
- demonstrate the ability to terminate signal and data cables
- 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 procedures
- perform all related tasks to specification
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMFAB0011A Manual soldering/de-soldering - electrical/electronic components
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0071A Use electrical/electronic measuring devices
- MEMCOR0191A Use hand tools

For termination and connection of specialist cables, see Unit MEMINS0062A (Install specialist cables).

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- safety and work procedures:
- standards of quality
- installation tools and equipment
- types of signal and data cables
- materials used in installation
- connection of wiring
- fixing methods
- types of joints
- termination and connection methods
- installation methods

Skills

The ability to:

- work safely to instructions
- select and use appropriate tools and equipment
- use terminating tools and equipment
- handle materials
- select material and supplies
- join signal and data cables
- terminate signal and data cables
- 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 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

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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 retrieval 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 SkillsKnowledge

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

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

Materials may include:

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

Examples of machines that could be covered include:

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

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

- standards of quality
- safety
- workshop procedure.

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

- mechanical cutting equipment
- holing /holing equipment

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 SkillsKnowledge

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

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

Drawing records may include

- cataloguing
- issuing security classifications
- filing
- preparing
- distribution lists
- drawings

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

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 center lines

Consultations may include reference to appropriate personnel including

- technical supervisory
- manufacturers
- suppliers
- contractors
- customers

Specifications may be obtained from

- design information
- customer deals/concepts/expectations/requirements
- sketches
- preliminary layouts

Drawing instruments and supplies:

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

Alphabet of line:

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

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.
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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

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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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.

MEMCOR0042A: Interpret standard specifications and manuals

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively interpret quality specifications and manuals to achieve required objectives/guidelines 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 access all documentation	1.1	Documentation covering all of the tiers of quality within the company are identified and used.
2.	Interpret documentation	2.1	Quality specification for specific processes and related systems are interpreted.
		2.2	The company quality improvement system related to the formal documentation are understood and used according to standard operating procedures.
3.	Explain documentation	3.1	Documentation relating to quality control/assurance is explained to appropriate personnel.
		3.2	Instructions based on documentation are given to appropriate personnel.
4.	Monitor quality processes/systems	4.1	Quality improvement systems are monitored and maintained.

RANGE STATEMENT

This standard covers a wide range of processes/systems and enterprises. It covers the interpretation of all of the tiers of quality documentation from the national factory act through to manuals, procedures and work instructions.

EVIDENCE GUIDE

Competency is to be demonstrated by individual interpreting quality specifications and manuals in accordance with the performance criteria and as related to the work environment.

(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 supervision and maintenance of the application of quality procedures or other units requiring the exercise of the skills and knowledge covered by this unit.

During assessment the individual will:

- take responsibility for the quality of their own work
- Interpret quality specifications and manuals to achieve required objectives
- perform interpretation accurately
- use accepted engineering techniques, practices, processes and workplace procedures

(2) Pre-requisite Relationship of Units

- MEMCOR0091 Interpret sketches and technical drawings

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- design theory and its application to the workplace
- common engineering terminology and maintenance safety requirements
- relevant OH&S regulations/requirements
- equipment, material and personal safety requirements
- engineering drawing procedures and interpretative techniques
- plain English literacy and communication techniques
- technical literacy and communication skills
- basic problem solving skills

Skills

The ability to:

- to locate, interpret and apply relevant operational quality and environmental information.
- Question and actively listen, for example when obtaining information of quality and environmental working practices.
- communication in plain English skills in relation to dealing with others involved in the work
- to interpret and apply common industry terminology, and interpret symbols used for quality and environmental signage.
- to assess quality and environmental issues.
- to interpret quality specifications and manuals

(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 orally, or by other methods of communication:

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

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 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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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 1	
Work with others and in team	Level 2	
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.

MEMINS0162A: Cut, fit and install trunking system

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively cut fit and install trunking systems associated with electrical installation instrumentation, 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	Trunking are checked against job requirements.
		1.5	Trunking are obtained in accordance with established procedures and to comply with requirements.
		1.6	Location in which trunking 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.
		1.9	Tools, equipment and testing devices needed to carry out the installation work are checked for correct operation and safety.
		1.10	Preparatory work is checked to ensure no unnecessary damage has occurred and complies with requirements.

- | | | | |
|----|---------------------------------------|-----|--|
| 2. | Install trunking | 2.1 | OH&S policies and procedures for installing trunking are followed. |
| | | 2.2 | Trunking are installed in accordance with requirements, without causing damage or distortion to the surrounding environment or services. |
| | | 2.3 | Trunking 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 before any contingencies are implemented. |
| | | 2.6 | On-going checks of the quality of the work are undertaken in accordance with established procedures. |
| 3. | Inspect and notify completion of work | 3.1 | Final inspections are undertaken to ensure the installed trunking conforms to requirements. |
| | | 3.2 | 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 legislation, 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
- threading;
- tapping
- finishing
- dismantling
- assembling

Fabrication techniques may include but not limited to:

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

Representative range of applications may include such things as

- apparatus
- circuits
- wiring systems
- plant,
- plugs
- lighting and switch boxes
- equipment
- tools
- accessories
- components
- meter panels
- draw boxes
- 24 way distribution panels

Installation techniques:

- surface mount
- flush mount
- in PVC trunking up to 32mm
- in metal not exceeding 25mm
- on masonry
- on steel
- with clamps
- with saddles
- on walls
- on floors
- on roofs
- access ways
- wood

Tools/equipment to include:

- electric hand drill
- drill bits
- cold chisel & files
- ball pein hammer
- reamers
- benders
- hole saws
- hack saw
- screwdrivers
- spirit level
- pipe dies
- pipes- PVC/metal
- pipe vices
- ladders

Type of site and working conditions to include

- domestic new and existing
- at height
- in confined space
- temperature variation
- damp and wet conditions
- indoors and out doors

EVIDENCE GUIDE

Competency is to be demonstrated by effectively install trunking systems in accordance with the range listed in the range of variables statement, relevant to the work orientation.

(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 that 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 trunking systems
- 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;
- plan tasks in all situations and review task requirements as appropriate;
- 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
- MEMCOR0171A Use graduated measuring devices
- MEMCOR0091A Draw and interpret sketches and simple drawings
- MEMCOR0191A Use hand tools
- MEMINS0051A Cut bend and install electrical conduits

(3) Underpinning Knowledge and SkillsKnowledge

Knowledge of:

- safety and work procedures:
- JS21 regulations and other relevant codes
- standards of quality
- installation tools and equipment
- materials used in trunking
- fabrication techniques
- installation techniques
- assembly/disassembly techniques

Skills

The ability to:

- handle ladders
- identify potential workplace hazards; preventative measures
- work with electrically operated tools and equipment
- read and interpret simple freehand sketches
- measure accurately
- communicate effectively
- bend 90^o, and offsets in trunking
- cut, thread and ream trunking
- install PVC and metal trunking

(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:

- 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.
<ul style="list-style-type: none"> • Carries out established processes • Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> • Manages process • Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> • 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.

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| 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 SkillsKnowledge

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
<ul style="list-style-type: none"> Carries out established processes Makes judgement of quality using given criteria 	<ul style="list-style-type: none"> Manages process Selects the criteria for the evaluation process 	<ul style="list-style-type: none"> 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.

MEMINS0172A: Prepare and install basic cable trays

Competency Descriptor:

This unit deals with the skills and knowledge required to effectively prepare and install cable trays associated with electrical installation instrumentation, 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	<p>1.1 Installation is planned and prepared to ensure OH&S policies and procedures are followed.</p> <p>1.2 The work is appropriately sequenced in accordance with requirements.</p> <p>1.3 Appropriate personnel are consulted to ensure the work is co-ordinated effectively with others involved on the work site.</p> <p>1.4 Cable trays are checked against job requirements.</p> <p>1.5 Cable trays are obtained in accordance with established procedures and to comply with requirements.</p> <p>1.6 Location in which trunking are to be installed is determined from job requirements.</p> <p>1.7 Materials necessary to complete the work are obtained in accordance with established procedures and checked against job requirements.</p> <p>1.8 Tools, equipment and testing devices needed to carry out the installation work are obtained in accordance with established procedures.</p> <p>1.9 Tools, equipment and testing devices needed to carry out the installation work are checked for correct operation and safety.</p> <p>1.10 Preparatory work is checked to ensure no unnecessary damage has occurred and complies with requirements.</p>

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|----|---------------------------------------|-----|---|
| 2. | Install cable trays | 2.1 | OH&S policies and procedures for installing cable trays are followed. |
| | | 2.2 | Cable trays are installed in accordance with requirements, without damage or distortion to the surrounding environment or services. |
| | | 2.3 | Cable trays 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. | Inspect and notify completion of work | 3.1 | Final inspections are undertaken to ensure the installed cable trays conforms to requirements. |
| | | 3.2 | Work is completed within acceptable time. |
| | | 3.3 | Work area is left clean and tidy. |
| | | 3.4 | 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 legislation, 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
- threading;
- tapping
- finishing
- dismantling
- assembling

Fabrication techniques may include but not limited to:

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

Representative range of applications may include such things as

- apparatus
- circuits
- wiring systems
- plant,
- plugs
- lighting and switch boxes
- equipment
- tools
- accessories
- components
- meter panels
- draw boxes
- 24 way distribution panels

Installation techniques:

- surface mount
- flush mount
- in PVC trucking up to 32mm
- in metal not exceeding 25mm
- on masonry
- on steel
- with clamps
- with saddles
- on walls
- on floors
- on roofs
- access ways
- wood

Tools/equipment to include:

- electric hand drill
- drill bits
- cold chisel & files
- ball pein hammer
- reamers
- benders
- hole saws
- hack saw
- screwdrivers
- spirit level
- pipe dies
- pipes- PVC/metal
- pipe vices
- ladders

Type of site and working conditions to include

- domestic new and existing
- at height
- in confined space
- temperature variation
- damp and wet conditions
- indoors and out doors

EVIDENCE GUIDE

Competency is to be demonstrated by safely and effectively prepare and install cable trays

Competency will be determined on evidence of having consistently performed across a representative range of applications which includes such things as apparatus, circuits, wiring systems, plant, equipment, tools, accessories, components and the like relative to that required for the category undertaken within and relevant to this unit of competence; autonomously and to requirements. Equivalent evidence from other sources is also acceptable

(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 prepare basic cable trays
- demonstrate correct procedures of installing prepared electrical panels in final location
- 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

(3) Underpinning Knowledge and Skills

Knowledge

Knowledge of:

- safety and work procedures:
- JS21 regulations and other relevant codes
- standards of quality
- installation tools and equipment
- materials used in installation
- materials used for cable trays
- fabrication techniques
- installation techniques
- assembly/disassembly techniques

Skills

The ability to:

- handle ladders
- identify potential workplace hazards; preventative measures
- work with electrically operated tools and equipment
- read and interpret simple freehand sketches
- measure accurately
- communicate effectively
- fabricate 90⁰, and offsets in cable trays
- install cable trays

(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