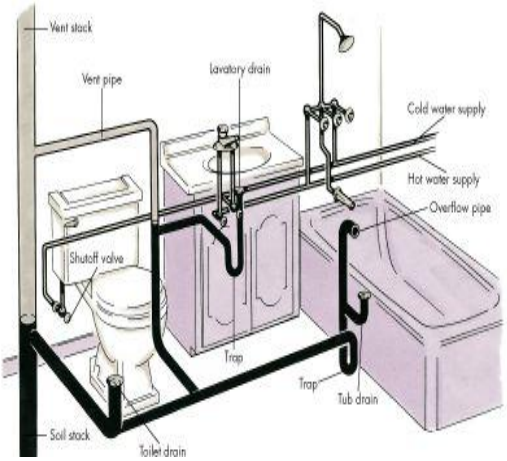
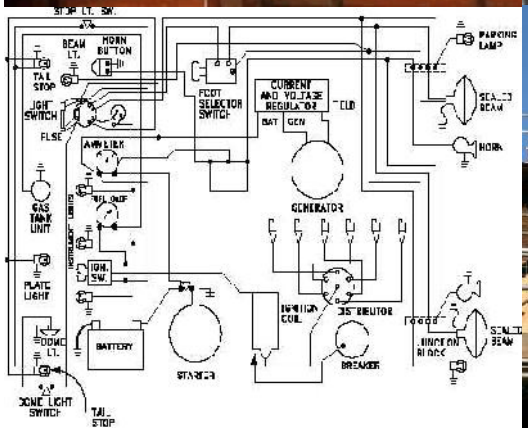
COMPETENCY STANDARD-CONSTRUCTION SECTOR





ELECTRICAL INSTALLER

CERTIFICATE LEVEL 3-FINAL DRAFT

ADB Grant 0211-LAO-Strengthening Technical and Vocational Education and Training (STVET) Project

ADB Grant 0211-LAO
Strengthening Technical and Vocational Education and Training (STVET) Project

LAO PDR

Occupation Area: **Construction**

Job Title: **Electrical Installer**

Competency Standard; **Electrical Installation,**

Certificate Level 3

FINAL VERSION 4 July 2012

This document has been verified or approved for use

CONTENTS

A Foreword

In order to ensure that the LAO PDR grows competitively over the coming years, we need to establish an ethos of excellence in everything that we do. This includes, particularly the Education & Employment sectors, as symbolised by Technical Vocational Education & Training (TVET)

Research has shown that countries without a functioning and effective TVET system will lose out in the competitiveness ratings, with a consequence negative impact on growth.

This Competency Standard was developed through the Strengthening Technical Vocational Education Training (STVET) Project, managed by SMEC with the support of the Asian Development Bank.

A.1 Project Title;

Strengthening Technical Vocational Education & Training in the LAO PDR

A.2 Project Donor & Number;

ADB Grant No. 0211-LAO (SF)

B Purpose of this Competency Standard

The Purpose of the Competency Standard (CS) for the **Electrical Installer** is to provide the basis for Competency Based Training (CBT) Programmes resulting in Competent Electrical Installers to support the Construction Sector in the Lao PDR.

C Competency Standard/Qualification Description/Job Description

This Competency Based Standard (CS) is for **Electrical Installer Level 3,** which level is defined in the Prime Minister Decree Number 0036/PM published in 2011.

This CS provides for structured occupational outcomes for domestic & commercial **Electric Installers.** The qualification covers the Basic Common & Core Competencies required by the Construction Industry for **Electric Installers.**

Persons deemed competent following assessment based on this Competency Standard can:-

- *Work on Electric Installation using complex multi- functional equipment*
- *Work on Jobs requiring minimal tolerance*
- *Be responsible for equipment*
- *Solve work problems using basic methods, tools & information*

This CS sits at NVQF Level 3 in Lao PDR, and is developed in line with CBT principles.

D Outline of this Competency Standard

This Competency Standard contains ***Units of Competency*** as detailed within. These **Units** form the basis for CBT Learning Programmes for Electrical Installer. Each **Unit** contains the required **Elements of Competency.** Each **Unit** can be amended in content or structure to meet the evolving needs of the **Electrical Installer**. Changes and amendments to this Competency Standard will be made in line with the existing Quality Assurance Procedures as approved by the appropriate authority.
This Competency Standard is structured in line with the approved Manual for Developing Competency Standards, developed as a part of the STVET programme. For Quality Assurance purposes, each Unit is coded in line with the example below;-

Code Example

Occupation	*Job*	*Sub Sector*	*Level*	*Unit Type*	*Unit No.*	*Version No*
Construction	Electrical Installer	0		Basic		
712	***7137***	***0***	***3***	***1***	***01***	***01***

Code example above displayed as;-
712.7137.031.01.01

Each Competency Standard for a Job contains a mix of Units structured as follows:-

Basic Units; **Cover a range of Occupations**

Common Units; **Common to jobs in the Construction Sector**

Core Units; **Technical & Specific to this job**

E. Basic Units of Competency

Unit 1 Lead workplace communication

Basic

Unit Code	***712.7137.031.01.01***
Unit Descriptor	*This unit of Basic Worker Competencies covers the knowledge, skills and attitudes required to lead in the dissemination and discussion of ideas, information and issues in the workplace.*

Unit 1 Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Communicate information about workplace processes	1.1. Appropriate ***communication method*** is selected 1.2. Multiple operations involving several topics areas are communicated accordingly 1.3. Questions are used to gain extra information 1.4. Correct sources of information are identified 1.5. Information is selected and organized correctly 1.6. Verbal and written reporting is undertaken when required 1.7. Communication skills are maintained in all situations
2. Lead workplace discussions	2.1. Response to workplace issues are sought 2.2. Response to workplace issues are provided immediately 2.3. Constructive contributions are made to workplace discussions on such issues as production, quality and safety 2.4. Goals/objectives and action plan undertaken in the workplace are communicated
3. Identify and communicate issues arising in the workplace	3.1. Issues and problems are identified as they arise 3.2. Information regarding problems and issues are organized coherently to ensure clear and effective communication 3.3. Dialogue is initiated with appropriate personnel 3.4. Communication problems and issues are raised as they arise

Unit 1 Lead workplace communication

Basic

Range of Variables

VARIABLES	RANGE
1. Methods of communication	1.1. Non-verbal gestures 1.2. Verbal 1.3. Face to face 1.4. Two-way radio 1.5. Speaking to groups 1.6. Using telephone 1.7. Written 1.8. Internet

Unit 1 Unit 1 Lead workplace communication Basic Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of Competency	Assessment requires evidence that the candidate: 1.1. Dealt with a range of communication/information at one time 1.2. Made constructive contributions in workplace issues 1.3. Sought workplace issues effectively 1.4. Responded to workplace issues promptly 1.5. Presented information clearly and effectively written form 1.6. Used appropriate sources of information 1.7. Asked appropriate questions 1.8. Provided accurate information
2. Underpinning knowledge	2.1. Organization requirements for written and electronic communication methods 2.2. Effective verbal communication methods
3. Underpinning Skills	3.1. Organize information 3.2. Understand and convey intended meaning 3.3. Participate in variety of workplace discussions 3.4. Comply with organization requirements for the use of written and electronic communication method
4. Resource Implications	The following resources should be provided: 4.1. Variety of Information 4.2. Communication tools 4.3. Simulated workplace
5. Methods of Assessment	Competency may be assessed through:- 5.1. Direct Observation 5.2. Interview Assessment of knowledge & underpinning skills may be combined *Evidence provided for Competency determination will be Valid, Sufficient & Current*
6. Context for Assessment	6.1. Competency may be assessed in the workplace or in an accredited workplace environment 6.2. Competency assessment must be undertaken in accordance with the Lao PDR CBT assessment guidelines

Unit 2 Lead small teams

Basic

Unit Code	***712.7137.031.02.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required to lead small teams including setting and maintaining team and individual performance standards.*

Elements & Performance Criteria

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Provide team leadership	1.1. ***Work requirements*** are identified and presented to team members 1.2 Reasons for instructions and requirements are communicated to team members 1.3. *Team members' queries and concerns are recognized*, discussed and dealt with.
2. Assign responsibilities	2.1. Duties, and responsibilities are allocated having regard to the skills, knowledge and aptitude required to undertake the assigned task according to company policy. 2.2. Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible.
3. Set performance expectations for team members	3.1. Performance expectations are established based on client needs and according to assignment requirements. 3.2. Performance expectations are based on individual team members duties and area of responsibility. 3.3. Performance expectations are discussed and disseminated to individual team members.
4. Supervise team performance	4.1. Monitoring of performance takes place against defined performance criteria and/or assignment instructions and corrective action taken if required. 4.2. Team members are provided with feedback, positive support and advice on strategies to overcome any deficiencies 4.3. Performance issues which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy 4.4. 4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer needs and satisfaction 4.5. Team operations are monitored to ensure that employer/client needs and requirements are met 4.6. Follow-up communication is provided on all issues affecting the team. 4.7. All relevant documentation is completed in accordance with company procedures

Unit 2 Lead small teams
Basic
Range of Variables

VARIABLES	RANGE
1. Work requirements	1.1. Client Profile 1.2 Assignment instructions
2. Team member's concerns	2.1. Shift details
3. Monitor performance	3.1. Formal process 3.2. Informal process
4. Feedback	4.1. Formal process 4.2. Informal process
5. Performance issues	5.1. Work output 5.2. Work quality 5.3. Team participation 5.4. Compliance with workplace protocols 5.5. Safety 5.6. Customer service

Unit 2 Lead small teams
Basic
Evidence guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical Aspects of Competency	Assessment requires evidence that the candidate has: 1.1. Maintained or improved individuals and/or team performance given a variety of possible scenario. 1.2. Assessed and monitored team and individual performance against set criteria. 1.3. Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf. 1.4. Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed 1.5. Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members.
2. Underpinning knowledge	2.1. Company policies and procedures. 2.2. Relevant legal requirements. 2.3. How performance expectations are set 2.4. Methods of Monitoring Performance 2.5. Client expectations 2.6. Team member's duties and responsibilities
3. Underpinning skills	3.1. Communication skills required for leading teams. 3.2. Informal performance counseling skills. 3.3. Team building skills. 3.4. Negotiating skills
4. Resource implications	The following resources should be provided; 4.1. Access to relevant workplace or accredited simulated environment where assessment can take place. 4.2. Materials relevant to the proposed activity or task.
5. Methods of assessment	Competency may be assessed through: 5.1. Observation of work, simulation and/or role play involving the participation of individual member to the attainment of organizational goal 5.2. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork. *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency assessment may occur in workplace or any accredited centre/ environment. 6.2. Assessment shall be observed while task are being undertaken whether individually or in-group. 6.3. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 3 Develop & practice negotiation skills

Basic

Unit Code	***712.7137.031.03.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required to collect information in order to negotiate to a desired outcome and to participate in the negotiation process*

Elements & Performance Criteria

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables
1. Plan negotiations	1.1. Information on ***preparing for negotiation*** is identified and included in the plan. 1.2. Information on creating ***non verbal environments*** for positive negotiating is identified and included in the plan 1.3. Information on ***active listening*** is identified and included in the plan. 1.4. Information on different ***questioning techniques*** is identified and included in the plan. 1.5. Information is checked to ensure it is correct and up-to-date.
2. Participate in negotiations	2.1. Criteria for successful outcomes are agreed upon by all parties 2.2. Desired outcome of all parties are considered. 2.3. Appropriate language is used throughout the negotiations 2.4. A variety of questioning techniques are used. 2.5. The issues and processes are documented and agreed upon by all parties 2.6. Possible solutions are discussed and their viability assessed 2.7. Areas for agreement are confirmed and recorded. 2.8. Follow-up action is agreed upon by all parties

Unit 3 Develop & practice negotiation skills Basic

Range of Variables

VARIABLE	RANGE
1. Preparing for negotiation	1.1. Background information on other parties to the negotiations. 1.2. Good understanding of topic to be negotiated. 1.3. Clear understanding of desired outcome/s. 1.4. Personal attributes • 1.4.1self awareness • 1.4.2 self esteem • 1.4.3 objectivity • 1.4.4 empathy • 1.4.5 respect for others • 1.4.6 Interpersonal skills • 1.4.7 listening/reflecting • 1.4.8 non verbal communication • 1.4.9 assertiveness • 1.4.10 behavior labeling • 1.4.11 testing understanding • 1.4.12 seeking information • 1.4.13 self disclosing 1.5. Analytical skills • 1.5.1 observing differences between content and process • 1.5.2 identifying bargaining information • 1.5.3 applying strategies to manage process • 1.5.4 applying steps in negotiating process • 1.5.5 strategies to manage conflict • 1.5.6 steps in negotiating process • 1.5.7 options within organization and externally for resolving conflict.
2. Non-verbal environments	2.1. Friendly reception 2.2. Warm and welcoming room 2.3. Refreshments offered 2.4. Lead in conversation before negotiation begins.
3. Active listening	3.1. Attentive 3.2. Not interrupting 3.3. Good posture 3.4. Maintain eye contact 3.5. Reflective listening.
4. Questioning techniques	4.1. Direct 4.2. Indirect 4.3. Open ended

Unit 3 Develop & practice negotiation skills
Basic
Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical Aspects of Competency	Assessment requires evidence that the candidate HAS: 1.4. Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome 1.4. Participated in negotiation with at least one person to achieve an agreed outcome.
2. Underpinning Knowledge	2.1. Codes of practice and guidelines for the organization 2.2. Organizations policy and procedures for negotiations 2.3. Decision making and conflict resolution strategies procedures. 2.4. Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation. 2.5. Flexibility 2.6. Empathy.
3. Underpinning skills	3.1. Interpersonal skills to develop rapport with other parties 3.2. Communication skills (verbal and listening) 3.3. Observation skills 3.4. Negotiation skills
4. Resource implications	The following resources will be provided: 4.1. Room with facilities necessary for the negotiation process 4.2. Human resources (negotiators)
5. Methods of assessment	Competency may be assessed through: 5.1. Observation/demonstration and questioning 5.2. Portfolio assessment 5.3. Oral and written questioning 5.4. Third party report *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency assessment may occur in workplace or any accredited centre/ environment. 6.2. Assessment shall be observed while task are being undertaken whether individually or in-group. 6.3. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 4 Solve problems related to workplace activities

Basic

Unit Code	***712.7137.031.04.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required to solve problems related to workplace activities*

Unit 4 Elements & Performance Criteria

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify the problem	1.1. Variances are identified from normal operating parameters; and product quality. 1.2. Extent, cause and nature are of the problem are defined through observation, investigation and ***analytical techniques***. 1.3. ***Problems*** are clearly stated and specified.
2. Determine fundamental problem causes	2.1. ***Possible causes*** are identified based on experience and the use of problem solving tools / analytical techniques. 2.2. Possible cause statements are developed based on findings 2.3. Fundamental causes are identified per results of investigation conducted.
3. Determine corrective actions	3.1. All possible options are considered for resolution of the problem 3.2. Strengths and weaknesses of possible options are considered 3.3. Corrective actions are determined to resolve the problem and possible future causes 3.4. ***Action plans*** are developed identifying measurable objectives, resource needs and timelines in accordance with safety and operating procedures.
4. Provide recommendations	4.1. Report on recommendations are prepared 4.2. Recommendations are presented to appropriate personnel in line with SOP & QMS 4.3. Recommendations are followed-up as required

Unit 4 Solve problems related to workplace activities

Basic

Range of Variables

VARIABLES	RANGE
1. Analytical techniques	1.1. Brainstorming 1.2. Intuition & Logic 1.3. Cause and effect diagrams 1.4. Pareto analysis 1.5. SWOT analysis 1.6. Gant chart, Pert CPM and graphs 1.7. Scatter-grams.
2. Problem issues	2.1. Non – routine process and quality problems 2.2. Equipment selection, availability and failure 2.3. Teamwork and work allocation problem 2.4. Safety and emergency situations and incidents.
3. Action plans	3.1. Priority requirements 3.2. Measurable objectives 3.3. Resource requirements 3.4. Timelines 3.5. Co-ordination and feedback requirements 3.6. Safety requirements 3.7. Risk assessment 3.8. Environmental requirements

Unit 4 Solve problems related to workplace activities

Basic

Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Identified the problem 1.2 Determined the fundamental causes of the problem 1.3 Determined the correct / preventive action 1.4 Provided recommendation to manager These aspects may be best assessed using a range of scenarios / case studies / what ifs as a stimulus with a walk through forming part of the response. These assessment activities should include a range of problems, including new, unusual and improbable situations that may have happened.
2. Underpinning Knowledge	2.1. Knowledge and understanding of the problem solving process. 2.2. Explain, fundamental causes resulting in corrective action recommendations covering:-. • Relevant equipment and operational processes. • Enterprise goals, targets and measures. • Enterprise quality, OHS and environmental requirement. • Principles of decision making strategies and techniques. • Enterprise information systems and data collation. • Industry codes and standards
3. Underpinning Skills	3.1. Using range of formal problem solving techniques 3.2. Identifying and clarifying the nature of the problem 3.3. Devising the best solution 3.4 Evaluating the solution 3.5 Implementation of a developed plan to rectify the problem

Unit 4 Solve problems related to workplace activities
Basic
Evidence Guide

4. Resource implications	Assessment will require 4.1. Access to an operating plant over an agreed period of time 4.2. A suitable method of gathering evidence of operating ability over a range of situations. 5.5. A bank of scenarios / case studies / what ifs. 5.6. Bank of questions. 5.7. Suitable Accredited centre
5. Methods of assessment	Competency may be assessed through: 5.1. Case studies on solving problems in the workplace 5.1. Observation The unit may be assessed in a holistic manner as is practical and may be integrated with the assessment of other relevant units of competency. Assessment will occur over a range of situations, which will include disruptions to normal, smooth operation. *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of Assessment	6.1. In the workplace. It may be appropriate to assess this unit concurrently with relevant teamwork or operational units. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 5 Use mathematical concepts & techniques

Basic

Unit Code	***712.7137.031.05.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required in the application of mathematical concepts and techniques*

Elements & Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA** ***Italicized*** terms are elaborated in the Range of Variables
1. Identify mathematical tools and techniques to solve problem	1.1. Problem areas are identified based on given condition. 1.2. ***Mathematical techniques*** are selected based on the given problem
2. Apply mathematical procedures/solutions	2.1. Mathematical techniques are applied based on the problem identified 2.2. Mathematical computations are performed to the level of accuracy required for the problem 2.3. Result of mathematical computations are determined and verified based on job requirements.
3. Analyse results	3.1. Result of application is reviewed based on expected and required specifications and outcome 3.2. Appropriate action is applied in case of error

Unit 5 Use mathematical concepts & techniques

Basic

Range of Variables

VARIABLE	RANGE
1. Mathematical techniques	May include but are not limited to: 1.1. Measurements 1.3. Use/Conversion of units of measurements 1.3. Use of standard formulas.
2. Appropriate action	2.1. Review in the use of mathematical techniques (e.g. recalculation, re-modeling) 2.2. Report & record error in line with SOP & QMS

Unit 5 Use mathematical concepts & techniques
Basic
Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1. Identified & reviewed the use of mathematical concepts and techniques for range of workplace problems. 1.2. Applied selected mathematical concepts & techniques to workplace problems.
2. Underpinning knowledge	2.1. Fundamental operation (addition, subtraction, division, multiplication) 2.2. Measurement system 2.3. Precision and accuracy 2.4. Basic measuring tools/devices
3. Underpinning skills	3.1. Applying mathematical computations 3.2. Using calculator/computer 3.3. Using different measuring tools.
4. Resource implications	4.1. Calculator 4.2. Basic measuring tools 4.3. Case Problems
5. Methods of assessment	5.1. Portfolio of evidence 5.2. Written Test 5.3. Interview/Oral Questioning 5.4. Demonstration *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in a simulated accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 6 Use relevant Technologies

Basic

Unit Code	***712.7137.031.06.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required in selecting, sourcing and applying appropriate and affordable technologies in the workplace*

Elements & Performance Criteria

ELEMENT	**PERFORMANCE CRITERIA** *Italicized* terms are elaborated in the Range of Variables
1. Study/select appropriate technology	1.1. Usage of different ***technologies*** is determined based on job requirements 1.2. Appropriate technology is selected as per work Specification.
2. Apply relevant technology	2.1. Relevant technology is effectively used in carrying out function 2.2. Applicable software and hardware are used as per task requirement 2.3. ***Management concepts*** are observed and practiced as per established industry practices.
3. Maintain/enhance relevant technology	3.1. Maintenance of technology is applied in accordance with the ***SOP***, manufacturer's operating guidelines and occupational health and safety procedure to ensure its operative ability 3.2. Updating of technology is maintained through continuing education or training in accordance with the job requirement 3.3. ***Non compliances*** or Technology failures are ***documented & reported*** in line with SOP, QMS, OHS

Unit 6 Use relevant technologies
Basic
Range of Variables

VARIABLE	RANGE
1. Technology	May include but are not limited to: 1.1. Office technology 1.2. Industrial technology 1.3. System technology 1.4. Information technology 1.5. Training technology
2. Management concepts	May include but not be limited to:- 2.1. Real Time Management 2.2. Continuous improvement 2.3. Total Quality Management 2.4. Other management/productivity tools.
3. Standard Operating Procedures	3.1. Standard Operating Procedures- relative to processes, impacting on people, tools, equipment. 3.2. Quality Management Systems & procedures 3.3. OHS systems & procedures 3.4. Non-compliance reporting

Unit 6 Use relevant technologies
Basic
Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical Aspects of Competency	Assessment requires evidence that the candidate has: 1.1 Studied and selected appropriate technology consistent with work requirements. 1.2 Applied relevant technology 1.3 Maintained and enhanced operative ability of relevant technology.
2. Underpinning knowledge	2.1. Awareness on technology and its function 2.2 Repair and maintenance procedure 2.3. Operating instructions 2.4. Applicable software 2.5. Communication techniques 2.6. Health and safety procedure 2.7. Company policy in relation to relevant technology 2.8. Different management concepts 2.9. Technology adaptability
3. Underpinning skills	3.1. Relevant technology application/implementation 3.2. Basic communication skills 3.3. Software applications skills 3.4. Basic troubleshooting skills
4. Resource implications	4.5. Relevant technology 4.5. Interview and demonstration questionnaires 4.5. Assessment packages
5. Methods of assessment	5.1. Portfolio of evidence 5.2. Written Test 5.3. Interview/Oral Questioning 5.4. Demonstration *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in a simulated accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

F. Common Units of Competency

Unit 1 Prepare construction materials & tools

Common

Unit Code	***712.7137.032.01.01***
Unit Descriptor	*This unit of Common Competency covers the knowledge, skills and attitudes for identifying, requesting and receiving construction materials and tools.*

Unit 1 Elements & Performance Criteria

ELEMENTS	**PERFORMANCE CRITERIA** ***Italicized*** terms are elaborated in the Range of Variables
1. Identify materials	1.1 ***Materials*** are listed as per job requirements 1.2 ***Quantity and description of materials*** conform with the job requirements 1.3 ***Tools and accessories are identified*** according to job requirements
2. Requisition materials	2.1 Materials and tools needed are requested according to the list prepared 2.2 Request is done as per company standard operating procedures (SOP) 2.3 Substitute materials and tools are provided without sacrificing cost and quality of work

Unit 1 Prepare construction materials & tools

Common

Range of Variables

VARIABLES	RANGE
1. Materials and Tools	1.1 Electrical supplies 1.2 Structural 1.3 Plumbing 1.4 Welding/pipefitting 1.5 Carpentry 1.6 Masonry
2. Description of Materials and Tools	2.1 Brand name 2.2 Size 2.3 Capacity 2.4 Kind of application
3. Company standard procedures	3.1 Job order 3.2 Requisition slip 3.3 Borrower slip

Unit 1 Prepare construction materials & tools
Common
Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Listed materials and tools according to quantity and job requirements 1.2 Requested materials and tools according to the list prepared and as per company SOP 1.3 Inspected issued materials and tools as per quantity and job specifications 1.4 Tools provided with appropriate safety devices
2. Underpinning knowledge	2.1 Types and uses of construction materials and tools 2.2 Different forms 2.3 Requisition procedures 2.4 Concrete materials preparation & mixes 2.5 Plaster materials preparation & mixes 2.6 Equipment types & functions 2.7 Brick & block types, functions & usage
3. Underpinning skills	3.1 Preparing materials and tools 3.2 Proper handling of tools and equipment 3.3 Following instructions 3.4 Concrete materials & mixing 3.5 Plaster materials & mixing 3.6 Brick & block handling 3.7 Tools & equipment handling
4. Resource implications	The following resources should be provided: 4.1 Workplace location 4.2 Materials relevant to the unit of competency 4.3 Technical plans, drawings and specifications relevant to the activities
5. Methods of assessment	Competency in this unit can be assessed through: 5.1 Direct observation 5.2 Questioning *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1 Competency may be assessed in the work place or in an accredited centre. 6.2 Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 2 Observe procedures, specification & manuals of instructions

Common

Unit Code	***712.7137.032.02.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required when identifying, interpreting, applying services to specifications and manuals and storing manuals.*

Unit 2 Elements & Performance Criteria

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify and access specification/manuals	1.5. Appropriate manuals are identified and accessed as per job requirements 1.5. Version and date of manual are checked to ensure that correct specification and procedures are identified
2 Interpret manuals	2.1. Relevant sections, chapters of specifications/ manuals are located in relation to the work to be conducted 2.2. Information and procedure in the manual are interpreted in accordance with industry practices
3. Apply information in manuals	3.1. Manual is interpreted according to job requirements 3.2. Work steps are correctly identified in accordance with manufacturer's specification 3.3. Manual data are applied according to the given task 3.4. All correct sequencing and adjustments are interpreted in accordance with information contained on the manual or specifications
4. Store manuals	4.1. Manual or specification is stored appropriately to prevent damage, ready access and updating of information when required in accordance with company requirements

Unit 2 Observe procedures, specifications & manuals of instructions Common

Range of Variables

VARIABLE	RANGE
1. Procedures, Specifications and Manuals of Instructions	Kinds of Manuals: 1.1. Manufacturer's Specification Manual. 1.2. Repair Manual. 1.3. Maintenance Procedure Manual. 1.4. Periodic Maintenance Manual

Unit 2 Observe procedures, specifications & manuals of instructions Common

Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	Assessment requires that the candidate has: 1.1. Identified and accessed specification/manuals as per job requirements. 1.2. Interpreted manuals in accordance with industry practices. 1.3. Applied information in manuals according to the given task 1.4. Stored manuals in accordance with company requirements
2. Underpinning Knowledge	2.1. Types of manuals used in construction sector. 2.2. Identification of symbols used in the manuals. 2.3. Identification of units of measurements 2.4. Unit conversion
3. Underpinning Skills	3.1. Reading and comprehension skills required to identify and interpret construction manuals and specifications 3.2. Accessing information and data
4. Resource implications	4.4. All manuals/catalogues relative to construction sector 4.4. SOP's, QMS, OHS Regulations.
5. Methods of Assessment	5.1. Direct observation 5.2. Questioning *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 3 Interpret technical drawings & plans

Common

Unit Code	***712.7137.032.03.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required when analysing and interpreting symbols, data in drawings and work plan.*

Unit 3 Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Analyze signs, symbols and data	1.1 ***Technical plans*** are obtained according to job requirements 1.2 Signs, symbols and data are identified according to job specifications 1.3 Signs symbols and data are determined according to ***classification*** or as appropriate in ***drawing***
2. Interpret technical drawings and plans	2.1 Necessary ***tools, materials*** and equipment are identified according to the ***plan*** 2.2 Supplies and materials are listed according to specifications 2.3 Components, assemblies or objects are recognized as required 2.4 Dimensions are identified as appropriate to the plan 2.5 Specification details are matched with existing/available resources and in line with job requirements. 2.6 Work plan is drawn following the specifications
3. Apply freehand sketching	3.1. Where applicable, correct freehand sketching is produced in accordance with the job requirements

Unit 3 Interpret technical drawings & plans

Common

Range of Variables

VARIABLES	RANGE
1. Technical Plans	Including but not limited to: 1.1 Electrical plans 1.2 Structural plans 1.3 Architectural plans 1.4 Plumbing plans 1.5 Welding Procedures Specifications (WPS)
2. Work plan	2.1 Job requirements 2.2 Installation instructions 2.3 Components instruction
3. Classification	Including but not limited to: 3.1 Electrical 3.2 Mechanical 3.3 Plumbing
4. Drawing	4.1. Welding Symbols 4.2. Drawing symbols. 4.3. Alphabet of lines 4.4. Orthographic views 4.5. Front view 5.8. Right side view/left side view 5.9. Top view 5.10. Pictorial 5.11. Schematic diagram 5.12. Electrical drawings 5.13. Structural drawings 5.14. Plumbing drawings 5.15. Water 5.16. Sewerage/Drainage 5.17. Ventilation
5. Tools & material	Including but not limited to; 5.1. Compass 5.2. Divider 5.3. Rulers 5.4. Triangles 5.5. Drawing tables 5.6. Computer

Unit 3 Interpret technical drawings & plans

Common

Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	1.1. Identified and determined signs, symbols and data according to work plan, job requirements & classifications 1.2. Identified tools and equipment & materials in accordance with job requirements. 1.3. Listed supplies and materials according to blueprint Specifications 1.4. Completed work plan following specifications. 1.5. Demonstrated ability to determine job specifications based on working / technical drawing
2. Underpinning knowledge	2.1. Mathematics • 2.1.1 Linear measurement • 2.1.2 Dimension • 2.1.3 Unit conversion 2.2. Reading Drawings & Plans • Electrical, mechanical plan, symbols and abbreviations • Drawing standard symbols 2.3. Trade Theory ▪ Basic technical drawing ▪ Types technical plans ▪ Various types of drawings • 2.3.4 Notes and specifications
3. Underpinning skills	3.1. Interpreting drawing/orthographic drawings 3.2. Interpreting technical plans 3.3. Matching specification details with existing resources 3.4. Following instructions 3.5. Handling of drawing instruments
4. Resource implications	4.1. Workplace 4.2. Drawings and specification relevant to task 4.3. Materials and instrument relevant to proposed activity
5. Methods of assessment	5.1. Direct observation 5.2. Questioning *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 4 Perform mensurations & calculations

Common

Unit Code	***712.7137.032.04.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required when identifying and measuring objects based on required performance standards*.

Unit 4 Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Select measuring instruments	1.1. Object or component to be measured is identified, classified and interpreted according to the appropriate regular geometric shape. 1.2. Measuring tools are selected/identified as per object to be measured or job requirements 1.3. Correct specifications are obtained from relevant sources 1.4. Appropriate measuring instruments are selected according to job requirements. 1.5. Alternative measuring tools are used without sacrificing cost and quality of work
2. Carry out measurements & calculations	2.1. Accurate ***measurements*** are obtained according to job requirements. 2.2. ***Calculation*** needed to complete work tasks are performed using the four basic process of addition (+), subtraction (-), multiplication (x) and division (/) including but not limited to: trigonometric functions, algebraic computations. 2.3. Calculations involving fractions, percentages and mixed numbers are used to complete workplace

Unit 4 Perform mensurations & calculations

Common

Range of Variables

VARIABLES	RANGE
1. Geometric Shapes	Including but not limited to:- 1.1. B Round 1.2. Square 1.3. Rectangular 1.4. Triangle 1.5. Sphere 1.6. Conical
2. Measuring Instruments	2.1. Micrometer (In-out, depth) 2.2. Vernier caliper (out, inside) 2.3. Dial gauge with mag, std. 2.4. Straight edge 2.5. Thickness gauge 2.6. Torque gauge 2.7. Small hole gauge 2.8. Telescopic gauge 2.9. Try-square 2.10. Protractor 2.11. Combination gauge 2.12. Steel rule 2.13. Thermometers
3. Measurements & calculations	3.1. C Linear 3.2. Volume 3.3. Area 3.4. Inside diameter 3.5. Circumference 3.6. Length 3.7. Thickness 3.8. Outside diameter 3.9. Taper

Unit 4 Perform mensurations & calculations

Common Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	Assessment requires that the candidate has;- 1.1. Selected and prepared appropriate measuring instruments in accordance with job requirements 1.2. Performed measurements and calculations according to job requirements/ ISO
2. Underpinning Knowledge	Trade Mathematics/mensuration 2.1. Linear measurement 2.2. Dimensions 2.3. Unit conversion 2.4. Ratio and proportion 2.5. Trigonometric functions 2.6. Algebraic equations
3. Underpinning skills	3.1. Performing calculation by addition, subtraction, multiplication and division; trigonometric functions and algebraic equations 3.2. Visualizing objects and shapes 3.3. Interpreting formulas for volume, areas, perimeters of plane and geometric figures 3.4. Proper handling of measuring instruments.
4. Resource implications	The following resources should be provided:- 4.1. Workplace location 4.2. Problems to solve 4.3. Measuring instrument appropriate to carry out tasks 4.4. Instructional materials relevant to the propose activity.
5. Method of assessment	5.1 Direct observation 5.2 Questioning *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 5 Maintain tools & equipment

Common

Unit Code	***712.7137.032.05.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required when checking the condition of tool & equipment, performing preventive maintenance and storing of tools and equipment.*

Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Check condition of tools & equipment	1.1. Materials, tools and equipment are identified according to classification and job requirements 1.2. Non-functional tools and equipment are segregated and labeled according to classification 1.3. Safety of tools and equipment are observed in accordance with manufacturer's instructions 1.4. Condition of PPE are checked in accordance with manufacturer's instructions
2. Perform basic maintenance	2.1. Appropriate lubricants are identified according to types of equipment 2.2. Tools and equipment are lubricated according to preventive maintenance schedule or manufacturer's specifications 2.3. Measuring instruments are checked and calibrated in accordance with manufacturer's instructions 2.4. Tools are cleaned and lubricated according to standard operating procedures 2.5. Defective instruments, equipment and accessories are inspected and replaced according to manufacturer's specifications 2.6. Tools are inspected, repaired and replaced after use 2.7. Work place is cleaned and kept in safe state in line with SOP, QMS & OHS regulations
3. Store tools & equipment	3.1. Inventory of tools, instruments and equipment are conducted and recorded as per company practices 3.2. Tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or SOP, OHS, QMS

Unit 5 Maintain tools & equipment
Common
Range of Variables

VARIABLES	RANGE
1. Materials	Including but not limited to;- 1.1. Lubricants 1.2. Cleaning materials 1.3. Rust remover 1.4. Rugs 1.5. Spare parts
2. Tools & equipment	Including but not limited to;- 2.1. Cutting tools - hacksaw, crosscut saw, rip saw 2.2. Boring tools - auger, brace, grinlet, hand drill 2.3. Holding tools - vise grip, C-clamp, bench vise 2.4. Threading tools - die and stock, taps 2.5. Measuring instruments/equipmentn
3. PPE	Including but not limited to;- 3.1. Goggles 3.2. Gloves 3.3. Safety shoes 3.4. Aprons/Coveralls
4. Forms	4.1. Maintenance schedule forms 4.2. Requisition slip 4.3. Inventory form 4.4. Inspection form 4.5. Reporting form

Unit 5 Maintain tools & equipment

Common

Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical Aspects of Competency	Assessment requires that the candidates has;- 1.1. Selected and used appropriate processes, tools and equipment to carry out task 1.2. Identified functional and non-functional tools and equipment 1.3. Checked, lubricated and calibrated tools, equipment and instruments according to manufacturer's specifications 1.4. Replaced defective tools, equipment and their accessories 1.5. Observed and applied safe handling of tools and equipment and safety work practices 1.6. Prepared and submitted inventory report, where applicable 1.7. Maintained workplace in accordance with OHSA regulations 1.8. Stored tools and equipment safely in appropriate locations and in accordance with company practices
2. Underpinning Knowledge	***Safety Practices*** 2.1. Use of PPE 2.2. Handling of tools and equipment 2.3. Good housekeeping ***Materials Tools & equipment*** 2.4. Types and uses of lubricants 2.5. Types and uses of cleaning materials 2.6. Types and uses of measuring instruments and equipment. ***Preventative maintenance*** 2.7. Methods and techniques 2.8. Procedures
3. Underpinning skills	3.1. Preparing maintenance materials, tools and equipment 3.2. Proper handling of tools and equipment 3.3. Performing preventive maintenance 3.4. Following instructions
4. Resource implications	The following resources should be provided: 4.1. Workplace 4.2. Maintenance schedule 4.3. Maintenance materials, tools and equipment

	relevant to the proposed activity/task
5. Methods of assessment	5.1. Direct observation 5.2. Questioning *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 6 Apply OHS requirements in the Construction Industry

Common

Unit Code	***712.7137.032.06.01***
Unit Descriptor	*This unit of Common Competency covers the knowledge, skills and attitudes for OHS within any sector of the Construction Industry.*

Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Identify & assess risks	1.1. Hazards in the work area are identified, assessed and reported to designated personnel. 1.2. Safety risks in the work area are identified, assessed and reported to designated personnel. 1.3. Safe work practices, duty of care requirements and safe work instructions are followed for controlling risks. 1.4. OHS, hazard, accident or incident reports are contributed to according to workplace procedures and National OHS legislation and relevant information
2. Identify hazards & hazardous materials	2.1. Hazardous materials on a work site are correctly identified and, if appropriate, handled and used according to company and legislated procedures. 2.2. Measures for controlling risks and construction hazards are applied effectively and immediately 2.3. Hazardous materials that have safety implications for self and other workers are secured immediately they are identified, using appropriate signs and symbols. 2.4. Asbestos-containing materials are identified on a work site and reported to designated personnel
3. Plan & prepare for safe work practices	3.1. Correct personal protective equipment and clothing for each area of construction work are identified, worn, correctly fitted, used and stored according to enterprise procedures. 3.2. Selection of tools, equipment and materials, and organisation of tasks are performed in conjunction with other personnel on site and in accordance with enterprise procedures. 3.3. Required barricades and signage are determined and erected at the appropriate site location. 3.4. Material safety data sheets (MSDS), and job safety analysis (JSA) and safe work method statements relevant to the work to be carried out are identified and applied.

4.	Apply safe work practices	4.1. Tasks are performed in a manner that is safe for operators, other personnel and the general community in accordance with legislative requirements, and enterprise policies and procedures. 4.2. Plant and equipment guards are used in accordance with manufacturer specifications, work site regulations & standards. 4.3. Procedures and relevant authorities for reporting hazards, incidents and injuries are used. 4.4. Prohibited tools and equipment in areas with identified asbestos are recognised and not used. 4.5. Work site safety signs and symbols are identified and followed. 4.6. Work site area is cleared and maintained to prevent and protect self and others from incidents and accidents and to meet environmental requirements
5.	Follow emergency procedures	5.1. Designated personnel are identified in the event of an emergency for communication purposes. 5.2. Safe workplace procedures for dealing with accidents, various types of fire and other emergencies are followed, including identification or use, if appropriate, of fire equipment within scope of responsibilities. 5.3. Emergency response and evacuation procedures are known, practised and carried out effectively when required. 5.4. Emergency first aid treatment of minor injuries is carried out correctly and details of any treatment administered are reported accurately to designated personnel as soon as possible.

Unit 6 Apply OHS requirements in the construction industry
Common
Range of Variables

	VARIABLES	RANGE
1.	Hazards	1.1. Chemical spills 1.2. Work in confined spaces 1.3. Trenches, excavations 1.4. Falling objects 1.5. Gasses, fires 1.6. Hazardous materials 1.7. Extereme temperatures 1.8. Infectious diseases 1.9. Handling & moving equipment 1.10. Overhanging, protruding, sharp objects
2.	Designated persons	2.1. Safety officers 2.2. Managers, supervisors 2.3. Materials handling licensed persons C
3.	Safe work practices	3.1. Observing OHS practices 3.2. Risk assessment & emergency procedures 3.3. Use of fire-fighting equipment
4.	Duty of care requirements	4.1. Protect others from harm 4.2. National OHS regulations c
5.	Incidents	5.1. Accidents resulting in personal injury, damage to property 5.2. Events on site that require assessment and action c
6.	Legislation	6.1. National & Provincial OHS regulations
7.	Information, signs, symbols	7.1. Visual displayed symbols, tags, signs, instructions 7.2. Event reporting documents 7.3. Safety meeting records d
8.	Hazardous materials	8.1. Asbestos 8.2. Cleaning chemicals, solvents 8.3. Glues 8.4. Timber treatment products c
9.	Risk control measures	9.1. Elimination, substitution, isolation 9.2. Management control 9.3. PPE c
10.	PPE	Including but not limited to:- 10.1. Aprons, arm guards, caps, dust masks, respirators, ear muffs, ear plugs, gloves, hard hats, reflective vests, jackets, overalls, safety glasses & goggles, steel capped boots, UV protective clothing & sunscreen
11.	Tools, materials, equipment	Including but not limited to;- 11.1. Fire-fighting equipment, breathing apparatus, first aid kit, ladders & work platforms, PPE c
12.	Emergency equipment	Including but not limited to 12.1. Contact numbers, names, locations & procedures for local emergency services c

Unit 6 Apply OHS requirements in the construction industry Common
Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	A person demonstrating competency in this unit must be able to:- 1.1. Locate, interpret & apply relevant information, standards & specifications 1.2. Comply with a safety site plan & National & organisational OHS policy/procedures. 1.3. Implement required safety actions relevant to a range of situations & in line with OHS policy and procedures
2. Underpinning knowledge	2.1. Basic first aid procedures 2.2. OHS and Construction Terminology 2.3. Knowledge of OHS communication & visual display methods including signage. 2.4. Emergency response & evacuation procedures M
3. Underpinning skills	3.1. Recognise & respond effectively to a range of hazardous situations in the required manner 3.2. Deal with hazardous situations as part of a team 3.3. Communicate & report hazards & risks using a range of technologies suitable to the work environment 3.4. Identify & report faults in tools, equipment and facilities. 3.5. Use OHS legislation & required safety clothing & equipment 3.6. Use construction tools, materials & equipment safely.
4. Resource implications	4.1. Induction procedures 4.2. Realistic or simulated tasks covering mandatory OHS requirements 4.3. Relevant specifications & work instructions 4.4. Tools & equipment appropriate to applying safe work practices 4.5. Support materials appropriate to activity 4.6. Workplace instructions relating to safe work practices 4.7. Material safety data sheets 4.8. Research resources
5. Methods of assessment	5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

Unit 7 Apply gender & social equity principles & policies

Common

Unit Code	***712.7137.032.07.01***
Unit Descriptor	*This unit covers the knowledge, skills and attitudes required to apply principles and policies on gender and social equity contributing to positive and productive work environment.*

Elements & Performance Criteria

ELEMENTS	**PERFORMANCE CRITERIA** *Italicized* terms are elaborated in the Range of Variables
1. Follow guidelines or rules of conduct related to gender and social equity in the workplace	1.1 ***Workplace practices and work instructions*** relating to interacting with different social groups based on gender, ethnicity and disability are recognized and followed, and clarification is sought where necessary 1.2 Relevant ***legislation, codes and national standards*** that impact on gender and social equity are recognized and followed 1.3 Introduction of and amendments to guidelines in the work conduct related to gender and social fairness practices are responded to positively and promptly in accordance with organizational requirements.
2. Contribute to improve workplace guidelines in promoting gender and social equity	2.1 ***Suggestions*** are made to ***designated personnel*** on how to improve social interaction and communication in the workplace to better promote gender and social equity 2.2 Information is gathered and improvements are suggested to help improve ***workplace guidelines and policies in promoting observing gender and social fairness***. 2.3 ***Gender and social equity issues*** in the workplace practices are discussed in the workplace with colleagues and designated personnel. 2.4 Contributions to the review of workplace guidelines and policies gender and social equity guidelines and policies are made within limits of responsibility
3. Recognize and report suspected cases of gender and other forms of social inequity	3.1 ***Signs and manifestations*** of gender and social inequities and its impact in the workplace are recognized. 3.2 Information about or observations of a suspected problem related to gender and social inequity are reported to supervisors and appropriate authorities. 3.3 Location and extent of suspected gender and social inequities is accurately ***recorded.*** 3.4 Reports on the effect of gender and social inequities are completed according to organizational guidelines.

Unit 7 Apply gender & social equity principles & policies

Common

Range of Variables

VARIABLES	RANGE
1. Workplace practices and work instructions	1.1 Social diversity awareness, recognition and analysis in the workplace 1.2 Use of gender fair and socially inclusive language in dealing with co-workers and students 1.3 Sexual harassment and bullying incident recording and reporting procedures 1.4 Verbal instructions from persons with responsibility related to gender and social equity awareness and sensitivity
2. Legislation, codes and national standards	2.1 Code of Conduct on sexual harassment in TVET institutions under MoES 2.2 National Strategy for the Advancement of Women, 2005-2010 (includes goals and programmes to promote Lao women's education, skill levels, income generating opportunities, among others 2.3 Lao PDR Law on Development and Protection of Women (Among others, aims to promote women's knowledge and competency, revolutionary morals and virtues, gender equality; seeks to eliminate all forms of discrimination against women; creates enabling conditions for women's participation; and for women to be equal force in national protection and development 2.4 Labor Law of Lao PDR, 1994 (Articles 2, 39 & 35) 2.5 Constitution of Lao PDR, 2003 (Articles 22, 24 & 27, statement on women of all ethnic groups should receive equal treatment in terms of legal rights, economic and social opportunities) 2.6 National obligations to international human rights conventions (Convention on the Elimination of all Forms of Discrimination against Women (CEDAW), 1981; Convention on the Rights of the Child (CRC), 1990
3. Suggestions	3.1 Be sensitive in terms of gender, ethnicity and disability in verbal and non-verbal communication 3.2 Stop the repetition of sexist and discriminatory sex jokes 3.3 Create and share jokes that are not told at the expense of different social groups 3.4 Recognize the rights of different social groups i.e. women, different ethnic groups, the disabled to equal access to training and skills development, respectful treatment, etc.

4. Designated personnel	4.1 School Administrator 4.2 Head teacher 4.3 Teacher and school staff designated as gender and social equity focal point 4.4 Workplace supervisor or other designated person
5. Workplace guidelines and policies in observing gender and social fairness.	5.1 Guiding workplace conduct against committing and reporting sexual harassment 5.2 Using language that is sensitive in terms of gender, ethnicity and disability 5.3 Information on personnel policies that are aligned with national and official policies and guidelines that uphold the rights of women, ethnic groups and the disabled 5.4 Provision of separate and secure accommodations, toilets wash and resting areas for women, ethnic groups and disabled people 5.5 The designation of a gender focal point among teachers, non-teaching staff and among student population.
6. Gender and social equity issues	6.1 Sexual harassment 6.2 Bullying 6.3 Voyeurism 6.4 Different forms of gender-based violence 6.5 Inappropriate and discriminatory language 6.6 Sex jokes that are discriminatory against women, ethnic groups, disabled people 6.7 Discrimination in the workplace
7. Signs or manifestations	7.1 Sub-standard performance, social withdrawal of affected group or individual 7.2 Lack of motivation to advance or excel 7.3 Absenteeism, intention to resign without reason 7.4 Display of fear, nervous and seemingly irrational behaviour of affected group in the presence of perpetuator
8. Reported	8.1 Verbally (face-to-face or through communication equipment) 8.2 In writing (memo, notes, faxes, email or electronic messages) 8.3 Witness or third party accounts
9. Recorded	9.1 Incident report 9.2 Public petitions 9.3 CCTV in the workplace

Unit 7 Apply gender & social equity principles & policies Common

Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of Competency	1.1 Demonstrated knowledge of workplace practices and work instructions. 1.2 Described relevant legislations, codes and national standards related to gender and social equity issues in the workplace 1.3 Followed workplace practices, policies and guidelines related to gender and social equity 1.4 Contributed to improve workplace guidelines in promoting gender and social equity 1.5 Recognized and reported on suspected cases of gender and other forms of social inequity 1.6 Reported, recorded or became aware of the need to report and document lack of compliance with guidelines and policies on gender and social fairness in the workplace
2. Underpinning Knowledge	2.1 Relevant legislation from all levels of government on gender and other social equity issues involving ethnic groups and disability 2.2 Relevant gender and social equity official legislation, policies and workplace practices and procedures 2.3 Good practice approaches relevant to work area particularly in regard to observance of and compliance with guidelines and policies that uphold and promote gender and social equity. 2.4 Gender and other social equity issues, especially in regard to sexual harassment and gender and other discrimination in the workplace 2.5 Gender issues in TVET areas traditionally not associated with women 2.6 General work place practices and their potential impact on the gender and other dimensions of social equity.

3. Underpinning Skills	3.1 Discuss and explain gender and other social equity issues in TVET 3.2 Communicate with co-workers and students in an inclusive manner that respects the rights of the different groups that constitute the workplace and the classroom 3.3 Recognize signs and manifestations of sexual harassment and other forms of gender-based violence in the workplace and in the classroom 3.4 Follow workplace directions and instructions 3.5 Ability to report and document cases of sexual harassment and other forms of gender-based violence and violence directed at other disadvantaged groups
4. Resource Implications	4.1 Induction procedures 4.2.Realistic or simulated tasks covering mandatory OHS requirements 4.3. Relevant specifications & work instructions 4.4.Tools & equipment appropriate to applying safe work practices 4.5.Support materials appropriate to activity 4.6.Workplace instructions relating to safe work practices 4.7.Material safety data sheets 4.8.Research resources
5. Methods of Assessment	Competency may be assessed through: 5.1 Written or oral Examination 5.2 Interview or Third Party Reports 5.3 Certificate of attendance in basic sensitization workshop on gender and other social equity issues *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context for Assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines

G. Core Units of Competency

Unit 1 Maintain Electric & hydraulic tools

Core

Unit Code	***712.7137.033.01.01***
Unit Descriptor	*This unit of Core Electrical Competencies deals with the knowledge, skills and attitudes when identifying and preparing materials and maintenance of electric power and hydraulic tools*

Unit 1 Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Request materials, tools and equipment	1.1 Quantity, usage and ***specifications*** of materials, tools and equipment are verified according to job requirements 1.2 Requisition form is properly filled-up according to list of materials, tools and equipment prepared 1.3 Requisition forms are approved by immediate superior
2. Select electrical power and hydraulic tools	2.1 ***Electrical power and hydraulic tools*** are identified and selected in line with job specification 2.2 Tools are inspected for damage in line with enterprise requirements 2.3 ***Damaged tools*** are reported to supervisor and repaired according to manufacturer's specifications
3. Maintain electrical power and hydraulic tools	3.1 Electrical power and hydraulic tools are lubricated in line with enterprise requirements 3.2 Auxiliary parts of power tools/hydraulic tools are inspected and replaced according to manufacturer's specifications 3.3 Electrical power and hydraulic tools are safety stored in line with enterprise requirements

Unit 1 Maintain electric & hydraulic tools
Core
Range of Variables

VARIABLES	RANGE
1. Specifications	1.1 Brand/Make - Classification/Type 1.2 Rating - Voltage - Current - Power - Frequency - Temperature - Service factor - Degree of protection - Utilization category - Harmonics - RPM - Pressure 1.3 Phase 1.4 Pole 1.5 Range (Tools must be specific) 1.6 Needed accessories
2. Electrical power and hydraulic tools	Including but not limited to: 2.1 Electrical power tools - Power drills - Portable grinder - Power saw 2.2 Hydraulic tools - Pipe bender - Jack hammer
3. Damaged tools	Including but not limited to: 3.1 Faulty plugs and cords of power tools 3.2 Damaged housing and accessories 3.3 Defective bearing, gasket, bushing 3.4 Centrifugal switch 3.5 Capacitors 3.6 Carbon brush

4. Specifications	4.1 Brand/Make - Classification/Type 4.2 Rating - Voltage - Current - Power - Frequency - Temperature - Service factor - Degree of protection - Utilization category - Harmonics - RPM - Pressure 4.3 Phase 4.4 Pole 4.5 Range (Tools must be specific) 4.6 Needed accessories

Unit 1 Maintain electric & hydraulic tools
Core
Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of Competency	Assessment requires evidence that the candidate has:- 1.1. Identified, selected electrical power and hydraulic tools in line with job specification/requirements 1.2. Checked quality and ratings of tools and accessories in line with job requirements 1.3. Inspected electrical tools for damages in line with enterprise requirements 1.4. Reported and repaired damaged electrical materials and tools to supervisor 1.5. Maintained and stored electrical materials, hand tools, electrical power tools and hydraulic tools in line with manufacturer's/ supplier's specifications and enterprise requirements
2. Underpinning knowledge	2.1. Types of electrical power tools 2.2. Types of electrical power tools 2.3. Common damage to tools 2.4. Maintenance procedure for electrical power and hydraulic tools
3. Underpinning skills	3.1. Material & tool preparation 3.2. Cleaning and maintaining electrical power and hydraulic tools.
4. Resource implications	The following should be provided;- 4.1. Workplace location 4.2. Tools appropriate for electrical installation
5. Methods of assessment	Competency can be assessed through:- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Unit 2 *Prepare Bus & Under-floor ducts for Electrical Installation*

Core

Unit Code	***712.7137.033.02.01***
Unit Descriptor	*This Unit of Competency covers the skills, knowledge and attitudes required when installing bus ways or bus ducts, fittings, boxes, and under floor ducts..*

Unit 2 Elements & Performance Criteria

ELEMENTS	**PERFORMANCE CRITERIA** ***Italicized*** terms are elaborated in the Range of Variables
1. Select materials	1.1. Technical drawings are interpreted to determine job requirements 1.2. ***Correct type and quantity of ducts*** are identified in line with job requirements 1.3. ***Tools and equipment*** are selected in line with job requirements 1.4. Correct ***PPE*** are identified and selected in line with safety requirements.
2. Install bus & floor ducts	2.1. Safety procedures are followed 2.2. Correct procedures for installation of bus and under-floor ducts are performed in line with job requirements 2.3. Schedule of work is monitored to ensure work is 2.4. completed in an agreed time, to a quality standard and with a minimum of waste 2.5. Unplanned events or conditions occurred are responded to accordingly 2.6. On-going checks of quality of work are undertaken in accordance with instructions and requirements.
3. Complete work	3.1. Final checks are made to ensure that work conforms with instructions and to requirements 3.2. Tools, equipment and any surplus resources and materials are checked/monitored in accordance with established procedures.

Unit 2 Prepare Bus & Under-floor ducts for Electrical Installation

Core

Range of Variables

VARIABLES	RANGE
1. Ducts	1.1. Bus 1.2. Under-floor
2. Tools & equipment	2.1. Hand Tools • Pliers • Screwdrivers • Wrenches • Wire splicers • Knives • Face shield • Pipe threader/bender • Hacksaw • Manual/Hydraulic puncher • Lubricants • Spare parts 2.2. Hand Tools • Electric hand drill • Tapping/Threading equipment • Soldering tools • Jack hammer 2.3. Instruments • Multi tester • Clamp ammeter • Insulation tester • Earth leakage tester • Ground resistance tester
3. Personal Protective Equipment (PPE)	Including but not limited to: 3.1. Working gloves 3.2. Safety shoes 3.3. Hard hat 3.4. Safety goggles

Unit 2 Prepare Bus & Under-floor ducts for Electrical Installation

Core

Evidence Guide

	ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1.	Critical Aspects of Competency	Assessment requires evidence that the candidate has:- 1.1. Planned and made technical drawings to determine job requirements 1.2. Selected appropriate tools, equipment and materials for performing rough-in activities 1.3. Selected and used correct personnel protective equipment 1.4. Demonstrated correct procedures for performing rough-in activities such as installing bus ducts and under-floor ducts and raceways 1.5. Followed safety procedures 1.6. Made final checks to ensure work completion and conforms with the working plan.
2.	Underpinning knowledge	2.1. Bus ducts • Uses, specifications & fixing methods 2.2. Under-floor ducts • Uses and specifications 2.3. Safe working routines 2.4. Lao Electrical Code (PEC) requirements v
3.	Underpinning skills	3.1. Interpreting plan and details 3.2. Preparing materials 3.3. Proper use of hand tools 3.4. Fixing methods for bus bars 3.5. Splicing 3.6. Dressing of wires 3.7. Terminating wires.
4.	Resource Implications	The following resources should be provided:- 4.1. Workplace location 4.2. Tools and equipment appropriate to building wiring electrical installation including 4.3. Materials relevant to the proposed activity 4.4. Drawings and specifications relevant to the task m
5.	Methods of assessment	Competency can be assessed through:- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current.*
6.	Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Unit 3 Install wiring devices for floor & ground fault current interrupting outlets

Core

Unit Code	***712.7137.033.03.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required for installing, selecting and documenting floor outlets and ground fault current interrupters.*

Unit 3 Elements & Performance Criteria

ELEMENTS	**PERFORMANCE CRITERIA** ***Italicized*** terms are elaborated in the Range of Variables
1. Select wiring devices	1.1 Drawings are read and interpreted to determine job requirements 1.2 Correct type and quantity of wiring devices and other materials are identified in line with job requirements 1.3 ***Tools and equipment*** are selected in line with job requirements 1.4 Correct ***PPE*** are identified and selected in line with safety requirements
2. Install wiring devices	2.1 ***Safety procedures*** are followed based on safety regulations 2.2 ***Correct procedures for installation*** of wiring devices are performed in line with job requirements 2.3 Schedule of work is followed based on agreed time, quality standard and minimum wastage 2.4 Further instructions are sought if unplanned events or conditions occur 2.5 On-going checking of quality of work are done in accordance with instructions and requirements
3. Notify completion of work	3.1. Final checks are made to ensure that work conforms with instructions and to requirements 3.2. Supervisor is notified upon completion of work 3.3. Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures 3.4. Waste materials and hazardous substances are disposal of in accordance with environmental rules and procedures 3.5. Work area is cleaned and made safe

Unit 3 Install wiring devices for floor & ground fault current interrupting devices

Core

Range of Variables

VARIABLES	RANGE
1. Wiring devices	1.1 Floor outlet 1.2 Ground fault current interrupting outlet
2. Tools and equipment	2.1 Pliers 2.2 Screwdrivers 2.3 Wrenches 2.4 Wire splicers 2.5 Knives 2.6 Floor & Ground fault
3. Personal protective equipment (PPE)	May include but not limited to: 3.1 Working gloves 3.2 Safety shoes 3.3 Hard hat
4. Safety procedures	4.1 Lao Electrical Code 4.2 Industrial safety 4.3 Electrical safety
5. Installation	5.1 Horizontally and vertically aligned 5.2 No gap between plate cover and wall 5.3 Wire cut to requirement 5.4 All bolts tightened for rigid mounting

Unit 3 Install wiring devices for floor & ground fault current interrupting devices

Core Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	Assessment requires evidence that the candidate has:- 1.1. Correctly interpreted work instructions 1.2. Selected appropriate tools, equipment and materials for building wiring installation 1.3. Selected and used correct PPE 1.4. Demonstrated correct procedures for installation of floor outlets and ground fault current interrupting outlets 1.5. Followed safety procedures 1.6. Cleaned worksite, tools and equipment 1.7. Stored surplus materials.
2. Underpinning knowledge	2.1. Installation procedures for floor outlets and ground fault current interrupting outlets 2.2. Use of ground fault current interrupting outlets 2.3. Safe work practices 2.4. LEC requirements c
3. Underpinning skills	3.1. Interpreting plan and details 3.2. Preparing materials 3.3. Proper use of hand tools 3.4. Splicing 3.5. Dressing of wires 3.6. Terminating wires b
4. Resource implications	The following should be provided:- 4.1. Workplace location 4.2. Tools and equipment appropriate for installation of wiring devices 4.3. Materials relevant to the proposed activity 4.4. Drawings and specifications relevant to the task
5. Methods of assessment	Competency can be assessed through:- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current.*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Unit 4 Installation of standard electrical protection system for lightning & grounding

Core

Unit Code	***712.7137.033.04.01***
Unit Descriptor	*This Unit of competency covers the Skills Knowledge & Attitudes required in the installation of electrical protection systems.*

Unit 4 Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Plan & prepare work	1.1. preparation of the work activity are communicated and confirmed to ensure clear understanding 1.2. Tools, equipment and PPE needed to install electrical wiring are identified, checked to ensure they work correctly as intended and are safe to use. 1.3. Materials needed for work are obtained in accordance with established procedures.
2. Install electrical protection system	2.1. ***Safety procedures*** are followed 2.2. ***Correct procedures*** for installation of electrical protection system are performed in line with job requirements and PEC 2.3. Schedule of work is followed to ensure work is completed in an agreed time, to a quality standard and with a minimum waste 2.4. Further instructions are sought from a supervisor if unplanned events or conditions occur 2.5. On-going checks of quality of work are done in accordance with instructions and requirements.
3. Notify & record work completion	3.1. Final checks are made to ensure the work conforms with instructions and requirements 3.2. Supervisor is notified upon completion of work 3.3. Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures 3.4. Waste materials and hazardous substances are disposal of in accordance with environmental rules and procedures 3.5. Work area is cleaned and made safe.

Unit 4 Installation of standard electrical protection system for lightning & grounding.

Core

Range of Variables

VARIABLES	RANGE
1. Electrical protect system component	1.1 Safety switch fuse cut-out 1.2 High/Low Voltage Switch Gear (HLVSG) 1.3 Earth Leakage Circuit Breaker (ELCB) 1.4 Conventional atmospheric lightning protection 1.5 Grounding and lightning protection system
2. Tools and equipment	Tools and equipment may include but not limited to: 2.1 Pliers 2.2 Screwdrivers 2.3 Wrenches 2.4 Wire splicers 2.5 Knives
3. Personal protective equipment (PPE)	3.1 Working gloves 3.2 Safety shoes 3.3 Hard hat
4. Safety procedures	4.1 Lao Electrical Code 4.2 Industrial safety
5. Installation	5.1 Horizontally and vertically aligned 5.2 Rigidly anchored to wall 5.3 Installed with clearance to wall/other boxes for cover to open freely 5.4 Enough clearance for cover opening for flush mounted

Unit 4 Installation of standard electrical protection system for lightning & grounding

Core Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	Assessment requires evidence that the candidate has:- 1.1. Correctly interpreted work instructions 1.2. Selected appropriate tools, equipment and materials for installation of electrical protection system 1.3. Selected and used correct PPE 1.4. Demonstrated correct procedures on installation of electrical protection systems including safety switch fuse cut-out, high/low voltage switch gear, earth leakage circuit breaker, conventional atmospheric lightning protection and grounding system 1.5. Followed safety procedures 1.6. Cleaned worksite, tools and equipment 1.7. Stored surplus materials.
2. Underpinning knowledge	2.1. Lao Electrical Code (LEC) requirements 2.2. Electrical protection system components 2.3. Use of electrical protection systems 2.4. Use of different electrical protection system, including safety switch fuse cut-out, high/low voltage switch gear, earth leakage circuit breaker, conventional atmospheric lightning protection and grounding system.
3. Underpinning skills	3.1. Interpreting plan and details 3.2. Preparing materials 3.3. Proper use of hand tools 3.4. Splicing 3.5. Dressing of wires 3.6. Terminating wires 3.7. Interpreting product technical brochure v
4. Resource Implications	The following resources should be provided;_ 4.1. Workplace location 4.2. Tools and equipment appropriate for installation of electrical protection systems 4.3. Materials relevant to the proposed activity 4.4. Drawings and specifications relevant to the task
5. Methods of assessment	Competency can be assessed through:- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current.*
6. Context of	6.1. Competency may be assessed in the work place or in

assessment	an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Unit 5 Install electric lighting systems, auxiliary outlets & lighting fixtures

Core

Unit Code	***712.7137.033.05.01***
Unit Descriptor	*This Core Unit covers the Skills Knowledge & Attitudes required when selecting & installing lighting systems, auxiliary outlets and lighting fixtures.*

Unit 5 Elements & Performance Criteria

ELEMENTS	**PERFORMANCE CRITERIA** ***Italicized*** terms are elaborated in the Range of Variables
1. Plan & prepare work	1.1. Instructions for the preparation of the work activity are communicated and confirmed to ensure clear understanding 1.2. ***Tools, equipment and personnel protective equipment (PPE)*** needed to install electrical wiring are identified, checked to ensure the work is done as intended and are safe to use in accordance with established procedures 1.3. ***Materials*** needed for work are obtained in accordance with established procedures 1.4. Materials needed to do the work are estimated according to job requirements.
2. Install lighting fixtures	2.1. ***Safety procedures*** are followed 2.2. ***Correct procedures*** for installation of lighting fixtures are performed in line with job requirements 2.3. Schedule of work is followed to ensure work is completed in an agreed time, to a quality standard and with a minimum waste 2.4. Further instructions are sought from a supervisor if unplanned events or conditions occur 2.5. On-going checks of quality of work are 2.6. Undertaken in accordance with instructions and requirements
3. Notify & record work completion	3.1. Final checks are made to ensure that work conforms with instructions and requirements 3.2. Supervisor is notified upon completion of work 3.3. Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures 3.4. Waste materials and hazardous substances are disposal of in accordance with environmental rules and procedures

Unit 5 Install electric lighting systems, auxiliary outlets & lighting fixtures

Core

Range of Variables

VARIABLES	RANGE
1. Tools & equipment	1.1. Electric hand tools 1.2. Hand tools including;- • Pliers • Screwdrivers • Wrenches • Splicers • Knives 1.3. Materials including Wiring, Cabling
2. PPE	2.1. Working gloves 2.2. Safety shoes 2.3. Hard hat
3. Light & fixtures	3.1. Flood lights/spotlights 3.2. Track lights 3.3. High/Low bay sodium vapor lamps,Halogen lamps 3.4. Perimeter lighting
4. Safety procedures	4.1. OHS, SOP 4.2. Lao Electric Code (LEC)
5. Installation of lighting fixtures	5.1. Floodlights/Spotlights • Horizontally aligned against wall • No gap between ceiling and lighting fixture base • Wiring at junction box cut to requirement as required • Floodlights/spotlights securely mounted 5.2. Track Lights • Wiring at junction box cut to requirement as required • Track light mounted securely 5.3. High/Low Bay Sodium Vapor Lamps • Wiring at junction box cut to requirement as required • High/Low sodium vapor lamps mounted securely 5.4. Halogen Lamps • Wiring at junction box cut to requirement • Halogen lamps mounted securely 5.5. Perimeter Lighting • Perimeter lighting installed as per plan/shop 5.6. Foundation constructed as per plan • Fixture wired and tested • Fixture mounted to pole

Unit 5 Install electric lighting systems, auxiliary outlets & lighting fixtures

Core

Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	Assessment requires evidence that the candidate has:- 1.1. Correctly interpreted work instructions 1.2. Selected appropriate tools, equipment and materials for Installing lighting fixtures 1.3. Selected and used correct personnel protective equipment 1.4. Demonstrated correct procedures for installation of lighting fixtures including, floodlights/spotlights, track lights, high/low bay sodium vapor lamps, halogen lamps and perimeter lighting 1.5. Followed safety procedures 1.6. Cleaned worksite, tools and equipment 1.7. Stored surplus materials
2. Underpinning knowledge	2.1. Types of lighting fixtures and installation technique 2.2. Proper use of hand tools 2.3. Knowledge of Lao Electrical Code (LEC) requirements 2.4. Ratings of lighting fixture 2.5. Principles of electric lighting
3. Underpinning skills	3.1. Interpreting electrical drawings and plans 3.2. Preparing materials 3.3. Interpreting product technical brochure 3.4. Proper use of hand tools 3.5. Splicing 3.6. Dressing of wires 3.7. Terminating wires
4. Resource implications	4.1. Workplace location 4.2. Tools, materials and equipment appropriate to building wiring electrical installation 4.3. Drawings and specifications relevant to the task
5. Methods of assessment	Competency can be assessed through:- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Unit 6 Install data measurement & control systems on electrical equipment

Core

Unit Code	***712.7137.033.06.01***
Unit Descriptor	*This Core Unit covers the Skills Knowledge & Attitudes required in installing wiring devices for power supply of data measurement system and auxiliary equipment.*

Unit 6 Elements & Performance Criteria

ELEMENTS	**PERFORMANCE CRITERIA** ***Italicized*** terms are elaborated in the Range of Variables
1. Plan and prepare work	1.1 Instructions for the preparation of work activity are communicated and confirmed to ensure clear understanding 1.2 ***Tools, equipment*** and ***personnel protective equipment*** needed to ***electrical system and by auxiliary equipment*** are identified, checked to ensure they work correctly as intended and are safe to use in accordance with established procedures 1.3 Materials needed to do the work are obtained and estimated in accordance with established procedures and plans.
2. Install electrical system & equipment	2.1. ***Safety procedures*** are followed 2.2. Correct ***procedures for installation*** of electrical system and auxiliary equipment are performed in line with job requirements 2.3. Schedule of work is followed to ensure work is completed in an agreed time, to a quality standard and with a minimum of waste 2.4. Unplanned events or conditions occurred are responded to accordingly 2.5. On-going checks of quality of work are undertaken in accordance with instructions and requirements 2.6. Conductors/wires are terminated/splice in accordance with the existing electrical standards
3. Complete works	3.1 Final checks are made to ensure that work conforms with instructions and to requirements 3.2 Completion report is prepared and submitted in line with SOP 3.3 Tools, equipment and any surplus resources 3.4 Work area monitored for safety & cleanliness in line with SOP

Unit 6 Install data measurement & control systems on electrical equipment

Core

Range of Variables

VARIABLES	RANGE
1. Tools and equipment	1.1 Electrical power tools 1.2 Hydraulic tools 1.3 Multi-testers, mega-ohmmeter, clamp ammeter 1.4 UPS, Drytype, transformer, capacitor bank, AVR and rectifier
2. Personal protective equipment (PPE)	Includes but is not limited to: 2.1 Working gloves 2.2 Safety shoes 2.3 Hard hat 2.4 Goggles/face shield
3. Electrical and auxiliary equipment	3.1 UPS 3.2 Drytype 3.3 Transformer 3.4 Capacitor bank 3.5 AVR 3.6 Rectifier/Frequency converter 3.7 Fire alarm system 3.8 Intercom 3.9 Digital watt meter
4. Safety procedures	4.1 Lao Electrical Code (LEC) 4.2 Industrial safety 4.3 Electrical safety
5. Installation of electrical system and auxiliary equipment	5.1 Installed and connected as per plan 5.2 Magnetic switches installed 5.3 Conducted preliminary testing prior to commissioning

Unit 6 Install data measurement & control systems on electrical equipment
Core
Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of Competency	Assessment requires evidence that the candidate has:- 1.1. Correctly followed work instructions 1.2. Selected appropriate tools, equipment and materials for installing electrical system and auxiliary equipment 1.3. Selected and used correct personal protective equipment 1.4. Demonstrated correct procedures for installation of electrical system and auxiliary equipment such as UPS, Dry-type, transformer, capacitor bank, AVR and rectifier 1.5. Made final checks to ensure work conforms with the plan 1.6. Followed safety procedures 1.7. Communicated effectively to ensure safety and effective work operations
2. Underpinning knowledge	2.1. Types and uses of: UPS • Dry type Transformer • Capacitor bank • AVR • Rectifier • other metering/central aux equipment 2.2. Knowledge on PEC requirements
3. Underpinning skills	3.1. AVR Installation processes 3.2. UPS Installation processes 3.3. Quality checking, recording & reporting
4. Resource implications	The following resources should be provided:- 4.1. Workplace location 4.2. Tools and equipment appropriate to building wiring installation 4.3. Materials for building wiring installation 4.4. Drawings and specifications for building wiring installation
5. Methods of assessment	Competency can be assessed through:- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current*
6. Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Unit 7 Assemble & Install electric motor control systems

Core

Unit Code	***712.7137.033.07.01***
Unit Descriptor	*This Core Unit covers the Skills Knowledge & Attitudes required in the assembly & installation of electrical control systems.*

Unit 7 Elements & Performance Criteria

ELEMENTS	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables
1. Check type & purpose of electrical control system	1.1. Provided ***Wiring diagrams*** and layout/shop drawings are interpreted in accordance with job requirements 1.2. Estimated work schedule is planned & verified in line with SOP 1.3. Correct rating, quantity, sizes and type of ***control components*** & wiring devices and other materials are identified in line with job requirements 1.4. Correct size and ***degree of protection*** of enclosures are verified in line with job requirements
2. Verify quality of materials, tools & equipment	2.1. Tools, equipment and testing instruments provided are verified in line with job requirements/SOP 2.2. Defective/Sub-standard electrical materials are identified and processed in line with SOP 2.3. Correct PPE are identified and selected in line with safety requirements 2.4. Inspection reports on quality of electrical materials and tools are provided in line with SOP
3. Assemble & install electrical control systems	3.1. Electrical components & devices are mounted or installed according to drawings, plans, specifications and Lao Electric Code/ standards 3.2. Electrical control components are wired correctly in accordance with wiring diagrams and LEC standards 3.3. Work schedule is followed in line with schedule & SOP 3.4. Preliminary & final checks/tests are conducted.
4. Installation completion process	4.1. Supervised performance tests are made to ensure that work conforms to instructions and job requirements. 4.2. Tools, equipment and any surplus materials are cleaned, checked and returned to storage in accordance with established procedures. 4.3. Waste materials and hazardous substances are disposed of in accordance with environmental rules and regulations & OHS

Unit 7 Assemble & install electric motor control systems

Core

Range of Variables

VARIABLES	RANGE
1. Wiring diagrams	1.1. Power circuits 1.2. Control circuits 1.3. Relay technology c
2. Control components & wiring devices	Includes but not limited to:- 2.1. Circuit breakers/Fuses 2.2. Magnetic Contactors 2.3. Relays 2.4. Power Cabinet or MCC 2.5. Timers 2.6. Terminal Blocks/Lugs 2.7. Pilot lamps 2.8. Actuators 2.9. Push buttons 2.10. Selector Switches 2.11. Cable duct 2.12. Din rail 2.13. Wire Strap 2.14. Wire Markers 2.15. Cable Tie 2.16. Tie Mount 2.17. Cable Glands/Grommet 2.18. Conductors 2.19. Insulators
3. Protection standards	3.1. LEC standards 3.2. Nema Standards 1,2,3/3R,4/4X,6,11,12 3.3. IEC Standards 3.4. International Protection (IP) 3.5. Product Standards
4. Testing instruments & tools	4.1. Tools • Pliers • Screw drivers • Wrenches • Wire splicers/strippers • Electrician knives • Electric Hand drill • Hand or electric taping/threading • Hack saw • Files – miscellanious • Manual/Hydraulic puncher • Measuring tools (e.g. Push-pull meter) • Crimping tools

	• Soldering tools • Manual/Hydraulic pipe bender • Manual/Electrical Pipe Threader/Reamer • High speed cutter 4.2. Testing Instruments • Multi-tester • Clamp ammeter • Insulation resistance tester • Ground resistance tester • Earth leakage tester • Harmonic meter • Phase Sequence Tester
5. PPE	5.1. Proper working clothes 5.2. Working gloves 5.3. Safety shoes 5.4. Gas/Dust mask 5.5. Hard hat 5.6. Safety goggles
6. Specifications & ratings	6.1. Brand/Make • Classification/Type 6.2. Rating • Voltage • Current • Power • Frequency • Temperature Rise • Service factor • Degree of protection • Utilization category • Harmonics 6.3. Phase 6.4. Range (Tools must be specific) 6.5. Identified accessories
7. Jointing	7.1. Splicing and joining of electrical conductor 7.2. Soldering electrical conductors 7.3. Solderless electrical connectors 7.4. Creepage distances 7.5. Clearances
8. Check/test procedures	8.1. Mechanical • Board/Panel properly leveled • Doors opened/closed with ease. • Paint not easily scratched/removed • Tightness of bolts and nuts • Type of protection • Cleanliness • Cable trays

	8.2. Electrical • Conductor size or Cross-section • Conductor Color Coding • Cables laid to avoid risk of short circuit • Grounding busbar conductor • Voltage Clearances/Creepage Distances • Control Voltage • High Voltage Test • Insulation Test • Continuity Test/Contact Resistance Test • Correct use of wire markers & terminals
9. Performance testing	9.1. Simulation Test/No Load Test 9.2. Phase sequence 9.3. Actual Operation 9.4. Temperature rise

Unit 7 Assemble & install electric motor control systems

Core

Evidence Guide

ASPECTS OF COMPETENCY	EVIDENCE REQUIREMENTS
1. Critical aspects of competency	1.1. Demonstrated understanding/interpretation on diagrams, symbols and work instructions 1.2. Demonstrated understanding of proper use of materials, tools and testing instruments for assembly of electrical control system 1.3. Selected and used correct personal protective equipment 1.4. Demonstrated correct procedures for installation and wiring of electrical control components 1.5. Demonstrated understanding on proper testing procedures 1.6. Followed work schedule 1.7. Demonstrated good work attitude
2. Underpinning knowledge	2.1. Materials use and specification 2.2. Economic use of materials 2.3. Safe working habits/Safety procedures 2.4. Lao Electrical Code (LEC) requirements 2.5. Electrical control components and devices 2.6. Correct procedures in assembling electrical control system 2.7. Mensuration 2.8. Cleaning of worksite, tools and equipment
3. Underpinning skills	3.1. Reading & interpreting electrical diagrams and work instructions correctly 3.2. Verifying materials, tools and testing instruments 3.3. Following wiring diagrams 3.4. Safe handling of materials 3.5. Proper using of hand tools 3.6. Splicing of conductors 3.7. Dressing/harnessing of wires 3.8. Terminating and insulating of wires 3.9. Storing excess materials 3.10. Checking quality of work 3.11. Communicating skills (both written and oral) 3.12. Measuring techniques/skills 3.13. Estimating quantity/bill of materials 3.14. Preparing request forms for supplies/materials/tools and equipment.
4. Resource implications	The following resources should be provided:- 4.1. Workplace location 4.2. Tools and equipment appropriate to assembly of electrical control system 4.3. Materials relevant to the activity 4.4. Wiring diagrams, layout/shop drawings and specifications relevant to the task

5.	Methods of assessment	Competency can be assessed through:- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current*
6.	Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Unit 8 Perform maintenance & troubleshooting work

Core

Unit Code	***712.7137.033.08.01***
Unit Descriptor	*This Unit covers the Skills Knowledge & Attitudes required in performing maintenance, troubleshooting and repair work.*

Unit 8 Elements & Performance Criteria

1. Plan, prepare & coordinate maintenance work	1.1. ***Maintenance work schedule*** is prepared in accordance with machine/equipment operating time/condition 1.2. Work instructions are prepared according to machine's manual and established enterprise procedures 1.3. ***Materials, tools, equipment, testing devices, permits & PPE*** needed are identified and requested & obtained in line SOP 1.4. **Potential hazards** are identified for prevention 1.5. Relevant department/personnel are informed on the schedule of work according to SOP.
2. Maintain electrical equipment & systems	2.1. Safety policies and procedures are followed in accordance with OSH and enterprise procedures 2.2. ***Electrical system or equipment parts*** are maintained according to manufacturer & SOP 2.3. Worn-out/malfunctioning systems or equipment parts are identified and replaced in accordance with manufacturer's requirements/SOP. 2.4. Maintenance report is compiled, approved & actioned
3. Troubleshoot faults in electrical equipment & systems	3.1. Indicators/Symptoms of fault or failure are identified. 3.2. Necessary electrical test on the system or equipment is performed in accordance with established procedure or according to manufacturers guidelines. 3.3. Extent of the fault to include the time to accomplish the job and the spare parts needed is estimated according to extent of damage. 3.4. Other works associated with the problem are coordinated with other concerned group. 3.5. Details of fault, possible cause, corrective action, recommendation to eliminate the problem are recorded accordingly.
4. Record work completion	4.1. Supervisor notified upon completion of work. 4.2. Performance tests are made to ensure that work conforms to instructions and job requirements. 4.3. Tools, equipment and any surplus materials are cleaned, checked and returned to storage area in accordance with established procedures. 4.4. Service report is prepared and submitted to supervisor

Unit 8 *Perform maintenance & troubleshooting works*
Core

Range of Variables

VARIABLES	RANGE
1. Maintenance work	1.1. Preventive 1.2. Corrective/Breakdown 1.3. Routine 1.4. Predictive 1.5. Condition based
2. Materials	Includes but not limited to;- 2.1. Contact cleaner 2.2. Insulating varnish/materials 2.3. Carbon brushes 2.4. Sand paper 2.5. Waste rugs 2.6. Electrical tapes 2.7. Warning tags, Signages, Lockout/tagout 2.8. Lubricants 2.9. Motor cleaner 2.10. Insulating oil 2.11. Coolant
3. Tools, equipment & testing devices	3.1. Electrician's hand tools • Pliers • Screwdrivers • Wrenches • Wire splicers • Knives • Bolt/Cable cutter • Knockout puncher • Torque wrench 3.2. Testing instruments/devices • Multi-tester (VOM) • Insulation resistance tester (Megger) • High potential tester • Low resistance tester • Phase sequence meter • Ammeter • Torque meter 3.3. Equipment • Labeling machine • Vacuum cleaner • Air blower • Dryer • Welding machine • Pressure washer • Vacuum pump

4.	PPE	Includes but not limited to;- 4.1. Working gloves 4.2. Safety shoes 4.3. Hard hat 4.4. Face shield 4.5. Insulating mat 4.6. Lockout tags 4.7. Safety goggles 4.8. Safety belt 4.9. Safety ladder
5.	Hazards	Includes but not limited to:- 5.1. Live wires 5.2. Oil spill 5.3. Chemical hazards 5.4. Flammable materials 5.5. Sources of energy 5.6. Moving machine parts 5.7. Sharp/pointed objects 5.8. Noise hazards 5.9. Confined space
6.	Electrical equipment/system parts	Includes but not limited to;- 6.1. Electrical • Carbon brushes • Brush holders • Slip ring • Commutators • Contactors • Relays • Circuit breakers • Wires • Timers • Switches and push buttons • Indicating lamps • Terminal blocks • Sensors 6.2. Mechanical • Bearings, Bushings, Shafts • Filters • Bolts and nuts • Belts, Pulleys, Couplings, Gears
7.	Electrical Measuring Instruments	Includes but not limited to;- 7.1. Multi-tester (VOM/DMM) 7.2. Insulation resistance tester (Megger) 7.3. High potential tester 7.4. Low resistance tester 7.5. Phase sequence meter 7.6. Ammeter
8.	Maintenance	Includes but not limited to;-

	records	8.1. Electrical plans 8.2. Equipment electrical diagrams 8.3. Historical records, Log books • Job orders • Commissioning test record • Preventive Maintenance schedules • Corrective Maintenance records • Manufacturer's maintenance guides • Equipment breakdown records • Periodic monitoring data • Service reports
9.	Quality Management Systems	9.1. ISO 9001 9.2. QS 9000 9.3. TS 16949 9.4. ISO 14000 9.5. ISO14001
10.	Problem indicators	Includes but not limited to;- 10.1. Heating of parts 10.2. Loose connections 10.3. Burned or exposed parts 10.4. Malfunction of logic controls 10.5. Abnormal/Unusual Noise/Smell/vibration 10.6. Intermittent operation 10.7. High current reading 10.8. Tripping of breakers
11.	Electrical testing	Includes but not limited to;- 11.1. Continuity test 11.2. Electrical insulation test 11.3. Earth resistance test 11.4. Phase sequence test 11.5. Load test 11.6. Winding resistance test 11.7. Free running test
12.	Testing Mechanical & electronic	Includes but not limited to;- 12.1. Mechanical works 12.2. Computer programs 12.3. Communication systems
13.	Performance testing	13.1. Simulation Test/No-Load Test 13.2. Phase sequence 13.3. Actual Operation 13.4. Temperature rise

Unit 8 *Perform maintenance & troubleshooting works*

Core

Evidence Guide

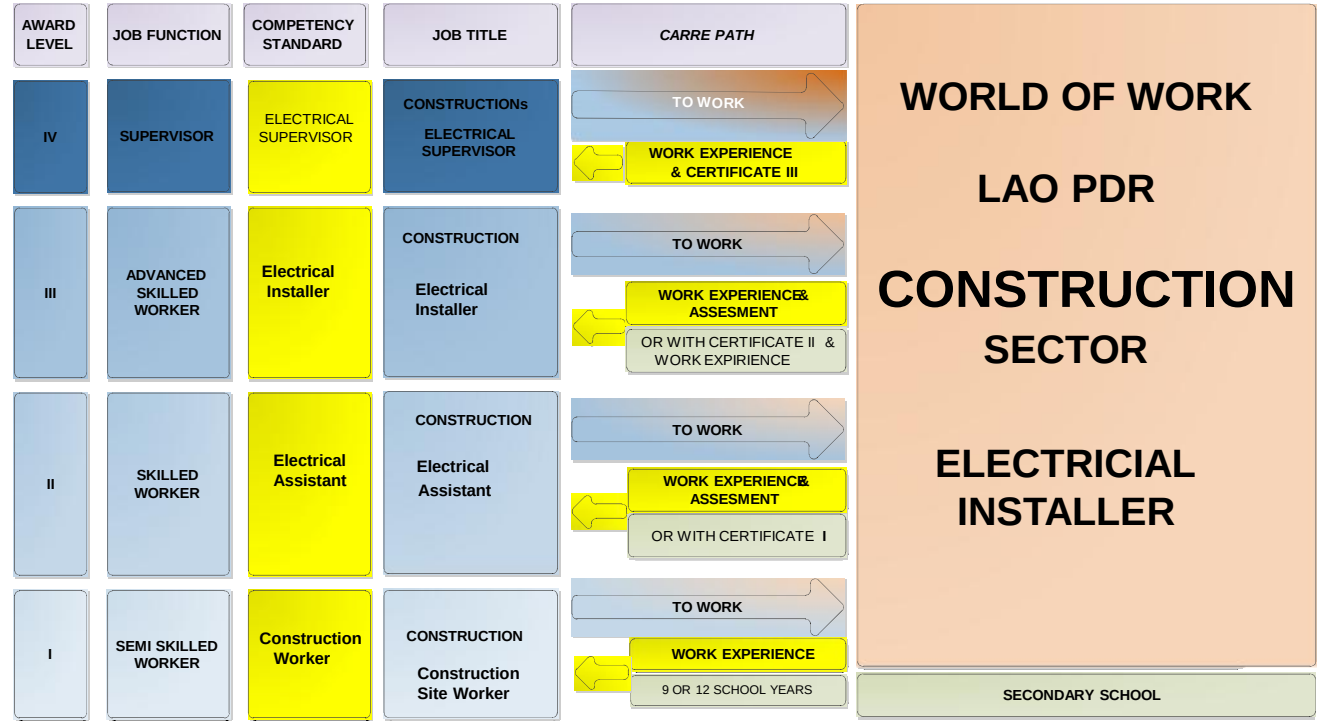
1.	Critical aspects of competency	Assessment requires evidence that the candidate has;- 1.1. Identified faults causes using maintenance troubleshooting procedures 1.2. Analyzed and interpreted electrical machine circuit diagram 1.3. Interpreted and analyzed periodic monitoring data 1.4. Demonstrated understanding on the use of electrical testing equipment 1.5. Demonstrated understanding on final inspection procedures 1.6. Coordinated effectively with others to ensure safe and effective work operations 1.7. Applied OHS in the workplace 1.8. Reported maintenance & troubleshooting outcomes in line with SOP
2.	Underpinning knowledge	2.1. Lao Electrical Code (LEC) requirements 2.2. Maintenance and troubleshooting procedures 2.3. Standard operating procedure in energizing electrical system 2.4. Mensuration 2.5. Interpretation of electrical plans/shop drawings 2.6. Interpretation of indicating instrument readings and test instruments 2.7. Electrical Laws and principles 2.8. Sensors/Actuators 2.9. Computer Operations-Basic Computer Operation 2.10. Pneumatics and Electro-Pneumatics 2.11. Types of potential hazards 2.12. OHS Safety practices
3.	Underpinning skills	3.1. Interpreting plan and details 3.2. Tracing circuits 3.3. Performing basic first-aid 3.4. Practicing safe working habits 3.5. Using test instruments 3.6. Troubleshooting skills 3.7. Application of maintenance procedures 3.8. Preparing/obtaining materials, PPE, tools, equipment and testing devices in line with established procedures 3.9. Estimating the time required to accomplish the job (depending on extent of damage) 3.10. Evaluating condition of damage 3.11. Selecting prevention and/or control measures 3.12. Proper handling of equipment, tools, materials and consumables 3.13. Operating computers 3.14. Communication skills
4.	Resource	The following resources should be provided;-

	implications	4.1. Workplace location 4.2. Tools, equipment and materials appropriate to maintenance and troubleshooting relevant to the task 4.3. Drawings and specifications relevant to the task 4.4. Service report form
5.	Methods of assessment	Competency can be assessed through;- 5.1. Direct observation 5.2. Questioning 5.3. Portfolio *Evidence provided for competency determination will be Valid, Sufficient & Current*
6.	Context of assessment	6.1. Competency may be assessed in the work place or in an accredited centre. 6.2. Assessment must be undertaken in accordance with Lao PDR CBT assessment guidelines.

Annex 1 Entry, Awards & Career Progresion Model

ADB Grant 0211-LAO STVET Project

Entry, Awards & Career Progression Model-CONSTRUCTION



Entry to Learning or Employment at any level is dependent on the existing Learning or Work experience of the Learner. This Learning can be provided either in document format/Award as above or by way of work experience records and competency assessment, if required, or both.

Award entry & progression requirements MMR AUT V1.pptx

Annex 2 Competency Map Electrical Installer 3

Basic	Receive & respond to Workplace communication	Work with others	Demonstrate work values	Practice basic housekeeping procedures	Participate in workplace communication	Work in a team environment	Practice career professionalism	
	Practice OHS procedures	Lead workplace communication	Lead small working teams	Develop & practice negotiation skills	Solve problems related to work activities	Use Mathematical concepts & techniques	Use relevant technologies	
	Use Specialised communication skills	Develop Team & individuals	Apply problem solving techniques in the workplace	Manage project costs & quality	Collect Analyse & organise information	Plan & organise work	Provide environmental protection	
Common	Prepare Construction Materials, tools equipment	Observe procedures, specifications & manuals of instructions	Interpret technical drawings & plans	Perform mensurations & calculations	Maintain tools & equipment	Apply OHS in the workplace	Apply gender & social equity principles & policies	
Core	Prepare electrical materials & tools	Perform roughing-in for basic electrical layout	Install wiring devises for power, lights & auxiliary outlets	Install electrical wiring	Install basic electrical protection systems	Install basic auxiliary outlets & lighting fixtures	Commission low volt electrical systems	
	Perform roughing-in for communication & distribution systems	Install wiring devices for floor & ground fault current interrupting outlets	Install electrical system for lightning & grounding	Install electric lighting on auxiliary outlets & lighting fixtures	Install communication, signalling devices & remote control systems on auxiliary equipment	Commission installed electrical systems		
	Prepare electrical & hydraulic tools	Prepare Bus & under-floor ducts for electrical installation	Install wiring devices for floor & ground fault current interrupting outlets	Installation of standard electrical protection system for lighting & grounding	Install electric lighting systems, auxiliary outlets & lighting fixtures	Install data measurement & control systems on electrical equipment	Assemble & install electric motor control systems	Perform maintenance & trouble shooting work
	Supervise installation & maintenance on electrical systems & equipment	Commission electrical system/equipment	Programme & install PLC systems					

Annex 3 Competency Standard development team Construction

No.	Name and Surname	Organization/Company	Job Expert
1.	Mr Khampheng Sitthivong	STVET Project	NC
2.	Mr Paul Farrelly	STVET Project	IC

Resource Person / Methodologist

3.	Mr Chanthachone	Lao – Korea VTC	Plumber

Resource Persons / Company & Industry

4.	Mr Phouvanh Vilahong	Luangpaseuth	Construction
5.	Mr Vilaphonexay Sihavong	Luangpaseuth	Construction

Resource Persons / Public & Private TVET Institutions

6.	Mr. Khamtanh Simalavong	Trainer Nampapa (W T C)	Plumber
7.	Mr Maytry Xamountry	Vocational Education Development Center	Electricity
8.	Mr Souvilay Laybouaban	Trainer (EDLTC)	Electricity
9.	Mr Taktoyoudtiya Homrasmy	Technical College Pakpasak Vientiane	Construction
10.	Mrs. Amphaychith Boudbouathong	Technical College Pakpasak Vientiane	Construction
11.	Mr Phouvong Saliou	Savannakhet Vocational Technical School	Construction
12.	Mr Bounterm Khamisy	Vocational Education Development Center	Construction
13.	Mr Phasy Phanthavong	Trainer (EDLTC)	Electricity
14.	Mr Sifong Thongpasseuth	Technical College Pakpasak Vientiane	Construction