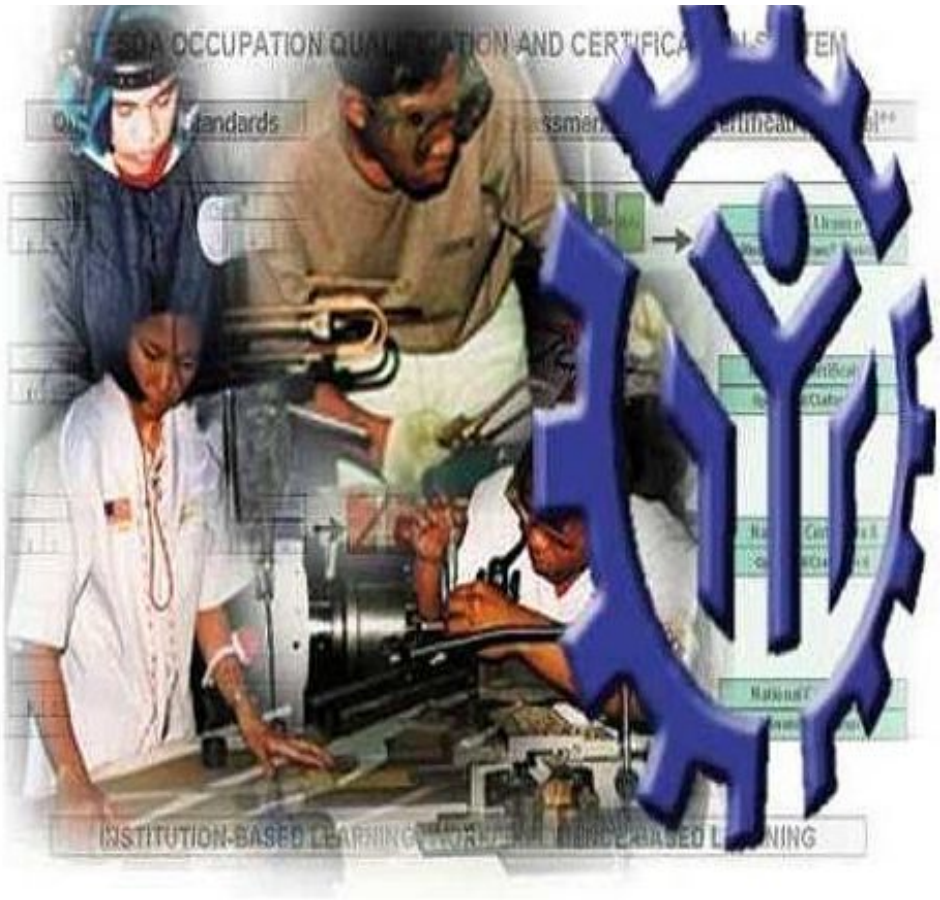
TRAINING REGULATIONS



ELECTRICAL INSTALLATION AND MAINTENANCE NC II

ELECTRICAL & ELECTRONICS SECTOR

TECHNICAL EDUCATION AND SKILLS DEVELOPMENT AUTHORITY
East Service Road, South Luzon Expressway, Taguig City, Metro Manila

Technical Education and Skills Development Act of 1994
(Republic Act No. 7796)

Section 22, "Establishment and Administration of the National Trade Skills Standards" of the RA 7796 known as the TESDA Act mandates TESDA to establish national occupational skill standards. The Authority shall develop and implement a certification and accreditation program in which private industry group and trade associations are accredited to conduct approved trade tests, and the local government units to promote such trade testing activities in their respective areas in accordance with the guidelines to be set by the Authority.

The Training Regulations (TR) serve as basis for the:

1. Competency assessment and certification;
2. Registration and delivery of training programs; and
3. Development of curriculum and assessment instruments.

Each TR has four sections:

Section 1 Definition of Qualification - refers to the group of competencies that describes the different functions of the qualification.

Section 2 Competency Standards - gives the specifications of competencies required for effective work performance.

Section 3 Training Standards - contains information and requirements in designing training program for certain Qualification. It includes curriculum design; training delivery; trainee entry requirements; tools, equipment and materials; training facilities; trainer's qualification; and institutional assessment.

Section 4 National Assessment and Certification Arrangement - describes the policies governing assessment and certification procedure

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ELECTRICAL & ELECTRONICS SECTOR

ELECTRICAL INSTALLATION & MAINTENANCE NC II

TRAINING REGULATIONS FOR

ELECTRICAL INSTALLATION & MAINTENANCE NC II

SECTION 1 ELECTRICAL INSTALLATION & MAINTENANCE NC II QUALIFICATION

The Electrical Installation and Maintenance NC II Qualification consists of competencies that a person must achieve to enable him/her to install and maintain electrical wiring, lighting and related equipment and systems where the voltage does **not** exceed 600 volts in residential houses/buildings.

This Qualification is packaged from the competency map of Electrical and Electronics sector as shown in Annex A.

The Units of Competency comprising this Qualification include the following:

CODE NO.	BASIC COMPETENCIES
500311105	Participate in workplace communication
500311106	Work in a team environment
500311107	Practice career professionalism
500311108	Practice occupational health and safety procedures

CODE NO.	COMMON COMPETENCIES
ELC311205	Use Hand Tools
ELC311201	Perform Mensuration and Calculation
ELC311202	Prepare and Interpret Technical Drawing
ELC311204	Apply Quality Standards
ELC311206	Terminate and Connect Electrical Wiring and Electronic Circuits

CODE NO.	CORE COMPETENCIES
ELC741301	Perform roughing-in activities, wiring and cabling works for single-phase distribution, power, lighting and auxiliary systems
ELC741302	Install electrical protective devices for distribution, power, lighting, auxiliary, lightning protection and grounding systems
ELC741303	Install wiring devices of floor and wall mounted outlets, lighting fixtures/switches, and auxiliary outlets

A person who has achieved this Qualification is competent to be:

- Building-Wiring Electrician
- Residential/Commercial-Wiring Electrician
- Maintenance Electrician

SECTION 2 COMPETENCY STANDARDS

This section gives the details of the contents of the units of competency required in ELECTRICAL INSTALLATION & MAINTENANCE NC II. These units of competency are categorized into basic, common and core competencies.

BASIC COMPETENCIES

UNIT OF COMPETENCY : PARTICIPATE IN WORKPLACE COMMUNICATION
UNIT CODE : 500311105
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to gather, interpret and convey information in response to workplace requirements.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Obtain and convey workplace information	1.1 Specific and relevant information is accessed from ***appropriate sources*** 1.2 Effective questioning , active listening and speaking skills are used to gather and convey information 1.3 Appropriate ***medium*** is used to transfer information and ideas 1.4 Appropriate non- verbal communication is used 1.5 Appropriate lines of communication with supervisors and colleagues are identified and followed 1.6 Defined workplace procedures for the location and ***storage*** of information are used 1.7 Personal interaction is carried out clearly and concisely	• Effective communication • Different modes of communication • Written communication • Organizational policies • Sources of information • Types of question • Medium of communication • Flow of communication • Storage system • Telephone courtesy	• Follow simple spoken language • Performing routine workplace duties following simple written notices • Ability to relate to people of social range in the workplace • Gather and provide information in response to workplace requirements • Listening skills • Questioning skills • Workplace language skills
2. Participate in workplace meetings and discussions	2.1 Team meetings are attended on time 2.2 Own opinions are clearly expressed and those of others are listened to without interruption 2.3 Meeting inputs are consistent with the meeting purpose and established ***protocols*** 2.4 ***Workplace interactions*** are conducted in a courteous manner	• Communication procedures and systems • Meeting protocols • Nature of workplace meetings • Barriers of communication • Workplace interactions • Non-verbal communication	• Ability to relate to people of social range in the workplace • Interpersonal communication skill • Observing meeting protocols

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	2.5 Questions about simple routine workplace procedures and maters concerning working conditions of employment are asked and responded to 2.6 Meetings outcomes are interpreted and implemented		
3. Complete relevant work related documents	3.1 Range of ***forms*** relating to conditions of employment are completed accurately and legibly 3.2 Workplace data is recorded on standard workplace forms and documents 3.3 Basic mathematical processes are used for routine calculations 3.4 Errors in recording information on forms/ documents are identified and properly acted upon 3.5 Reporting requirements to supervisor are completed according to organizational guidelines	• Technology relevant to the enterprise and the individual's work • Types of workplace documents and forms • Basic mathematical concepts • Kinds of workplace report	• Apply basic mathematical processes of addition, subtraction, division and multiplication • Data recording • Report writing

RANGE OF VARIABLES

VARIABLE	RANGE
1. Appropriate sources	1.1. Team members 1.2. Suppliers 1.3. Trade personnel 1.4. Local government 1.5. Industry bodies
2. Medium	2.1. Memorandum 2.2. Circular 2.3. Notice 2.4. Information discussion 2.5. Follow-up or verbal instructions 2.6. Face to face communication
3. Storage	3.1. Manual filing system 3.2. Computer-based filing system
4. Forms	4.1. Personnel forms, telephone message forms, safety reports
5. Workplace interactions	5.1. Face to face 5.2. Telephone 5.3. Electronic and two way radio 5.4. Written including electronic, memos, instruction and forms, non-verbal including gestures, signals, signs and diagrams
6. Protocols	6.1. Observing meeting 6.2. Compliance with meeting decisions 6.3. Obeying meeting instructions

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1. Prepared written communication following standard format of the organization 1.2. Accessed information using communication equipment 1.3. Made use of relevant terms as an aid to transfer information effectively 1.4. Conveyed information effectively adopting the formal or informal communication
2. Resource Implications	2.1. Fax machine 2.2. Telephone 2.3. Writing materials 2.4. Internet
3. Methods of Assessment	3.1. Direct Observation 3.2. Oral interview and written test
4. Context of Assessment	Competency may be assessed individually in the actual workplace or through accredited institution

UNIT OF COMPETENCY: WORK IN TEAM ENVIRONMENT
UNIT CODE : 500311106
UNIT DESCRIPTOR : This unit covers the skills, knowledge and attitudes to identify role and responsibility as a member of a team.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Describe team role and scope	1.1. The ***role and objective of the team*** is identified from available ***sources of information*** 1.2. Team parameters, reporting relationships and responsibilities are identified from team discussions and appropriate external sources	• Team roles • Definition of Team • Difference between team and group • Different source of information • Objectives and goals of team	• Describing the team role and scope
2. Identify own role and responsibility within team	2.1. Individual role and responsibilities within the team environment are identified 2.2. Roles and responsibility of other team members are identified and recognized 2.3. Reporting relationships within team and external to team are identified	• Team structure • Roles and responsibility of team members • Teams in work environment • Fundamental rights at work including gender sensitivity	• Communicate appropriately, consistent with the culture of the workplace • Identifying individual role and responsibility • Identifying external relationship
3. Work as a team member	3.1. Effective and appropriate forms of communications used and interactions undertaken with team members who contribute to known team activities and objectives 3.2. Effective and appropriate contributions made to complement team activities and objectives, based on individual skills and competencies and ***workplace context*** 3.3. Observed protocols in reporting using standard operating procedures 3.4. Contribute to the development of team work plans based on an understanding of team's role and objectives and individual competencies of the members.	• Communication process • Group planning and decision making • Team goals and objectives • Understanding individual competencies relative to teamwork • Types of individuals • Role of leaders	• Interacting effectively with others • Setting team goals and expectations

RANGE OF VARIABLES

VARIABLE	RANGE
1. Role and objective of team	1.1. Work activities in a team environment with enterprise or specific sector 1.2. Limited discretion, initiative and judgment maybe demonstrated on the job, either individually or in a team environment
2. Sources of information	2.1. Standard operating and/or other workplace procedures 2.2. Job procedures 2.3. Machine/equipment manufacturer's specifications and instructions 2.4. Organizational or external personnel 2.5. Client/supplier instructions 2.6. Quality standards 2.7. OHS and environmental standards
3. Workplace context	3.1. Work procedures and practices 3.2. Conditions of work environments 3.3. Legislation and industrial agreements 3.4. Standard work practice including the storage, safe handling and disposal of chemicals 3.5. Safety, environmental, housekeeping and quality guidelines

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1. Operated in a team to complete workplace activity 1.2. Worked effectively with others 1.3. Conveyed information in written or oral form 1.4. Selected and used appropriate workplace language 1.5. Followed designated work plan for the job 1.6. Reported outcomes
2. Resource Implications	The following resources MUST be provided: 2.1. Access to relevant workplace or appropriately simulated environment where assessment can take place 2.2. Materials relevant to the proposed activity or tasks
3. Methods of Assessment	Competency may be assessed through: 3.1. Observation of the individual member in relation to the work activities of the group 3.2. Observation of simulation and or role play involving the participation of individual member to the attainment of organizational goal 3.3. Case studies and scenarios as a basis for discussion of issues and strategies in teamwork
4. Context for Assessment	4.1. Competency may be assessed in workplace or in a simulated workplace setting 4.2. Assessment shall be observed while task are being undertaken whether individually or in group

UNIT OF COMPETENCY: PRACTICE CAREER PROFESSIONALISM
UNIT CODE : 500311107
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes in promoting career growth and advancement.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Integrate personal objectives with organizational goals	1.1. Personal growth and work plans are pursued towards improving the qualifications set for the profession 1.2. Intra- and interpersonal relationships are maintained in the course of managing oneself based on performance ***evaluation*** 1.3. Commitment to the organization and its goal is demonstrated in the performance of duties	• Work values and ethics (Code of Conduct, Code of Ethics, etc.) • Understanding personal objectives • Understanding organizational goals • Difference between intra and interpersonal relationship • Performance evaluation	• Demonstrate Intra and Interpersonal skills at work • Demonstrate personal commitment in work
2. Set and meet work priorities	2.1 Competing demands are prioritized to achieve personal, team and organizational goals and objectives. 2.2 ***Resources*** are utilized efficiently and effectively to manage work priorities and commitments 2.3 Practices along economic use and maintenance of equipment and facilities are followed as per established procedures	• Company policies • Company operations, procedures and standards • Time management • Basic strategic planning concepts • Resource utilization and management	• Managing goals and time • Practice economic use of resources and facilities • Setting work priorities • Practice time management
3. Maintain professional growth and development	3.1 ***Trainings and career opportunities*** are identified and availed of based on job requirements 3.2 ***Recognitions*** are sought/received and demonstrated as proof of career advancement 3.3 ***Licenses and/or certifications*** relevant to job and career are obtained and renewed	• Career development opportunities • Company recognition and incentives • Information on relevant licenses and or certifications	• Determining personal career development needs • Identifying career opportunities

RANGE OF VARIABLES

VARIABLE	RANGE
1. Evaluation	1.1 Performance Appraisal 1.2 Psychological Profile 1.3 Aptitude Tests
2. Resources	2.1 Human 2.2 Financial 2.3 Technology 2.3.1 Hardware 2.3.2 Software
3. Trainings and career opportunities	3.1 Participation in training programs 3.1.1 Technical 3.1.2 Supervisory 3.1.3 Managerial 3.1.4 Continuing Education 3.2 Serving as Resource Persons in conferences and workshops
4. Recognitions	4.1 Recommendations 4.2 Citations 4.3 Certificate of Appreciations 4.4 Commendations 4.5 Awards 4.6 Tangible and Intangible Rewards
5. Licenses and/or certifications	5.1 National Certificates 5.2 Certificate of Competency 5.3 Support Level Licenses 5.4 Professional Licenses

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Attained job targets within key result areas (KRAs) 1.2 Maintained intra - and interpersonal relationship in the course of managing oneself based on performance evaluation 1.3 Completed trainings and career opportunities which are based on the requirements of the industries 1.4 Acquired and maintained licenses and/or certifications according to the requirement of the qualification
2. Resource Implications	The following resources **MUST** be provided: 2.1 Workplace or assessment location 2.2 Case studies/scenarios
3. Methods of Assessment	Competency may be assessed through: 3.1 Portfolio Assessment 3.2 Interview 3.3 Simulation/Role-plays 3.4 Observation 3.5 Third Party Reports 3.6 Exams and Tests
4 Context of Assessment	Competency may be assessed in the work place or in a simulated work place setting

UNIT OF COMPETENCY: PRACTICE OCCUPATIONAL HEALTH AND SAFETY PROCEDURES
UNIT CODE : 500311108
UNIT DESCRIPTOR : This unit covers the outcomes required to comply with regulatory and organizational requirements for Occupational health and safety.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify hazards and risks	1.1 ***Safety regulations*** and workplace safety and hazard control practices and procedures are clarified and explained based on organization procedures 1.2 ***Hazards/risks*** in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures 1.3 ***Contingency measures*** during workplace accidents, fire and other emergencies are recognized and established in accordance with organization procedures	• OHS procedures and practices and regulations • Hazards/risks identification and control • OHS indicators • Organizational contingency practices	• Hazards/risks identification and control skills • Practice of safety and health procedures and personal hygiene
2. Evaluate hazards and risks	2.1 Terms of maximum tolerable limits which when exceeded will result in harm or damage are identified based on threshold limit values (TLV) 2.2 Effects of the hazards are determined 2.3 OHS issues and/or concerns and identified safety hazards are reported to designated personnel in accordance with workplace requirements and relevant workplace OHS legislation	• Threshold Limit Value (TLV) • Effects of safety hazards	• Communication skills • Reporting safety hazards
3. Control hazards and risks	3.1 Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies	• Personal hygiene practices • Organization safety and health protocol • Company emergency procedure practices	• Practice of personal hygiene • Respond to emergency

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	3.3 ***Personal protective equipment (PPE)*** is correctly used in accordance with organization OHS procedures and practices 3.4 Appropriate assistance is provided in the event of a workplace emergency in accordance with established organization protocol		
4. Maintain OHS awareness	4.1 ***Emergency-related drills and trainings*** are participated in as per established organization guidelines and procedures 4.2 ***OHS personal records*** are completed and updated in accordance with workplace requirements	• Workplace OHS personal records • Information on emergency-related drills	• Practice emergency-related drill skills in the workplace

RANGE OF VARIABLES

VARIABLE	RANGE	
1. Safety regulations	May include but are not limited to: 1.1 Clean Air Act 1.2 Building code 1.3 National Electrical and Fire Safety Codes 1.4 Waste management statutes and rules 1.5 Philippine Occupational Safety and Health Standards 1.6 DOLE regulations on safety legal requirements 1.7 ECC regulations	
2. Hazards/Risks	May include but are not limited to: 2.1 Physical hazards – impact, illumination, pressure, noise, vibration, temperature, radiation 2.2 Biological hazards- bacteria, viruses, plants, parasites, mites, molds, fungi, insects 2.3 Chemical hazards – dusts, fibers, mists, fumes, smoke, gasses, vapors 2.4 Ergonomics • Psychological factors – over exertion/ excessive force, awkward/static positions, fatigue, direct pressure, varying metabolic cycles • Physiological factors – monotony, personal relationship, work out cycle	
3. Contingency measures	May include but are not limited to: 3.1 Evacuation 3.2 Isolation 3.3 Decontamination 3.4 (Calling designed) emergency personnel	
4. PPE	May include but are not limited to: 4.1 Mask 4.2 Gloves 4.3 Goggles 4.4 Hard Hat	4.5 Face mask/shield 4.6 Ear muffs 4.7 Reflectorized vest 4.8 Safety shoes 4.9 Safety harness
5. Emergency-related drills and training	5.1 Fire drill 5.2 Earthquake drill 5.3 Basic life support/CPR 5.4 First aid 5.5 Spillage control 5.6 Decontamination of chemical and toxic 5.7 Disaster preparedness/management	
6. OHS personal records	6.1 Medical/Health records 6.2 Incident reports 6.3 Accident reports 6.4 OHS-related training completed	

EVIDENCE GUIDE

1. Critical Aspects of Competency	Assessment requires evidence that the candidate: 1.1 Explained clearly established workplace safety and hazard control practices and procedures 1.2 Identified hazards/risks in the workplace and its corresponding indicators in accordance with company procedures 1.3 Recognized contingency measures during workplace accidents, fire and other emergencies 1.4 Identified terms of maximum tolerable limits based on threshold limit value- TLV. 1.5 Followed Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace 1.6 Used Personal Protective Equipment (PPE) in accordance with company OHS procedures and practices 1.7 Completed and updated OHS personal records in accordance with workplace requirements
2. Resource Implications	The following resources must be provided: 2.1 Workplace or assessment location 2.2 OHS personal records 2.3 PPE 4.4 Health records
3. Methods of Assessment	Competency may be assessed through: 3.1 Portfolio Assessment 3.2 Interview 3.3 Case Study/Situation
4. Context for Assessment	Competency may be assessed in the work place or in a simulated work place setting

COMMON COMPETENCIES

UNIT TITLE : USE HAND TOOLS
UNIT CODE : ELC311205
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on the safe use, handling and maintenance of tools.

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for tasks to be undertaken	1.1. Tasks to be undertaken are properly identified 1.2. Appropriate ***hand tools*** are identified and selected according to the task requirements	• Planning and preparing task/ activity • Electronics hand tools and their uses • Function, operation and common faults in electronics hand tools	• Preparing required tasks • Communication skills • Using hand tools properly
2. Prepare hand tools	2.1. Appropriate hand tools are checked for proper operation and safety 2.2. Unsafe or faulty tools are identified and marked for repair according to standard company procedure	• Checking and safety requirements in handling tools • Standard procedures in checking, identification and marking of safe or unsafe/ faulty tools	• Identifying and checking hand tools • Marking of safe or unsafe/ faulty hand tools
3. Use appropriate hand tools and test equipment	3.1. Tools are used according to tasks undertaken 3.2. All safety procedures in using tools are observed at all times and appropriate ***personal protective equipment*** (PPE) are used 3.3. Malfunctions, unplanned or unusual events are reported to the supervisor	• Safety requirements in using electronics hand tools and test equipment • Electronics hand tools for adjusting, dismantling, assembling, finishing, and cutting. • Processes, Operations, Systems o Proper usage and care of hand tools o Types and uses of test equipment o Common faults in the use of hand tool	• Reading skills required to interpret work instruction and numerical skills • Using PPE properly • Problem solving in emergency situation
4. Maintain hand tools	4.1. Tools are not dropped to avoid damage 4.2. Routine ***maintenance*** of tools undertaken according to standard operational procedures, principles and techniques 4.3. Tools are stored safely in appropriate locations in accordance with manufacturer's specifications or standard operating procedures	• Safety requirements in maintenance of hand tools • Processes, Operations, Systems o Maintenance of tools o Storage of hand tools	• Checking and cleaning hand tools • Storing hand tools properly

RANGE OF VARIABLES

VARIABLE	RANGE
1. Hand tools	1.1. Hand tools for adjusting, dismantling, assembling, finishing, and cutting. Tool set includes the following but not limited to: screw drivers, pliers, punches, wrenches, files
2. Personal Protective Equipment (PPE)	2.1. Gloves 2.2. Protective eyewear 2.3. Apron/overall
3. Maintenance	3.1. Cleaning 3.2. Lubricating 3.3. Tightening 3.4. Simple tool repairs 3.5. Hand sharpening 3.6. Adjustment using correct procedures

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Demonstrated safe working practices at all times 1.2. Communicated information about processes, events or tasks being undertaken to ensure a safe and efficient working environment 1.3. Planned tasks in all situations and reviewed task requirements as appropriate 1.4. Performed all tasks to specification 1.5. Maintained and stored tools in appropriate location
2. Method of assessment	Competency in this unit must be assessed through: 2.1. Observation 2.2. Oral questioning
3. Resource Implication	Tools may include the following but not limited to: 3.1. Screw drivers 3.2. Pliers 3.3. Punches 3.4. Wrenches 3.5. Files
4. Context of Assessment	4.1. Assessment may be conducted in the workplace or in a simulated work environment

UNIT TITLE : PERFORM MENSURATION AND CALCULATION
UNIT CODE : ELC311201
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes and values needed identify, care, handle and use measuring instruments

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Select measuring instruments	1.1. Object or component to be measured is identified 1.2. Correct specifications are obtained from relevant source 1.3. Measuring tools are selected in line with job requirements	• Category of measuring instruments • Types and uses of measuring instruments • Shapes and Dimensions • Formulas for volume, areas, perimeters of plane and geometric figures	• Identifying and selecting measuring instruments • Visualizing objects and shapes
2. Carry out measurements and calculation	2.1. Appropriate ***measuring instrument*** is selected to achieve required outcome 2.2. Accurate measurements are obtained for job 2.3. ***Calculation*** needed to complete work tasks are performed using the four basic process of addition (+), subtraction (-), multiplication (x), and division (/) 2.4. Calculation involving fractions, percentages and mixed numbers are used to complete workplace tasks. 2.5. Numerical computation is self-checked and corrected for accuracy 2.6. Instruments are read to the limit of accuracy of the tool.	• Calculation & measurement • Four fundamental operation • Linear measurement • Dimensions • Unit conversion • Ratio and proportion	• Performing calculation by addition, subtraction, multiplication and division; • Interpreting formulas for volume, areas, perimeters of plane and geometric figures • Handling of measuring instruments
3. Maintain measuring instruments	3.1. Measuring instruments are not dropped to avoid damage 3.2. Measuring instruments are cleaned before and after using. 3.3. Proper storage of instruments undertaken according to manufacturer's specifications and standard operating procedures.	• Types of measuring instruments and their uses • Safe handling procedures in using measuring instruments • Four fundamental operation of mathematics • Formula for volume, area, perimeter and other geometric figures	• Handling and maintaining measuring instruments

RANGE OF VARIABLES

VARIABLE	RANGE
1. Measuring instruments	1.1. Straight edge 1.2. Torque gauge 1.3. Try square 1.4. Protractor 1.5. Combination gauge 1.6. Steel rule
2. Calculation	Kinds of part mensuration includes the following but not limited to: 2.1. Volume 2.2. Area 2.3. Displacement 2.4. Inside diameter 2.5. Circumference 2.6. Length 2.7. Thickness 2.8. Outside diameter 2.9. Taper 2.10. Out of roundness

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Selected proper measuring instruments according to tasks 1.2. Carried out measurement and calculations 1.3. Maintained and stores instruments
2. Method of assessment	Competency in this unit must be assessed through: 2.1. Observation 2.2. Oral questioning
3. Resource implication	3.1. Place of assessment 3.2. Measuring instruments 3.3. Straight edge 3.4. Torque gauge 3.5. Try square 3.6. Protractor 3.7. Combination gauge 3.8. Steel rule
4. Context of Assessment	4.1. Assessment may be conducted in the workplace or in a simulated environment

UNIT TITLE : PREPARE AND INTERPRET TECHNICAL DRAWING

UNIT CODE : ELC311202

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes and values needed to prepare/interpret diagrams, engineering abbreviation and drawings, symbols, dimension.

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Identify different kinds of technical drawings	1.1. Correct ***technical drawing*** is selected according to job requirements. 1.2. Technical drawings are segregated in accordance with the types and kinds of drawings	• Types of technical drawings • Applications for technical drawing • Methods of technical drawings • Symbols • Mark up/Notation of Drawings	• Reading skills required to interpret work instruction • Interpreting electrical/ electronic signs and symbols
2. Interpret technical drawing	2.1. Components, assemblies or objects are recognized as required. 2.2. ***Dimensions*** of the key features of the objects depicted in the drawing are correctly identified. 2.3. ***Symbols*** used in the drawing are identified and interpreted correctly. 2.4. Drawing is checked and validated against job requirements or equipment in accordance with standard operating procedures.	• Trade Mathematics o Linear measurement o Dimension o Unit conversion • Blueprint Reading and Plan Specification o Architectural, electrical, electronics, mechanical plan, symbols and abbreviations o Drawing standard symbols • Trade Theory o Basic technical drawing o Types technical plans o Various types of drawings o Notes and specifications	• Interpreting drawing/ orthographic drawing • Interpreting technical plans • Matching specification details with existing resources • Safety handling of drawing instruments
3. Prepare/ make changes to electrical/ electronic schematics and drawings	3.1. Electrical/electronic schematic is drawn and correctly identified. 3.2. Correct drawing is identified, equipment are selected and used in accordance with job requirements.	• Drawing conventions • Dimensioning Conventions • Mathematics o Four fundamental operations o Percentage o Fraction o Algebra o Geometry	• Reading skills required to interpret work instruction • Communication skills • Preparing/ Making electrical/ electronic signs and symbols • Computing formulas

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS

4. Store technical drawings and equipment/ instruments	4.1. Care and maintenance of drawings are undertaken according to company procedures.
	4.2. Technical drawings are recorded and inventory is prepared in accordance with company procedures.
	4.3. Proper storage of instruments is undertaken according to company procedures.
		• Effective ways to catalogue and store technical drawings
		• Manual methods of handling, storing and maintaining paper drawings
		• Storing drawing in digital forms
		  ○ Scanner
		  ○ CAD
			• Handling and storing of drawings
			• Scanning and storing drawings in digital form
			• Matching specification details with existing resources
			• Handling of drawing instruments

RANGE OF VARIABLES

VARIABLE	RANGE
1. Technical drawings	Technical drawings include the following but not limited to: 1.1. Schematic diagrams 1.2. Charts 1.3. Block diagrams 1.4. Lay-out plans 1.5. Location plans 1.6. Process and instrumentation diagrams 1.7. Loop diagrams 1.8. System Control Diagrams
2. Dimensions	Dimensions may include but not limited to: 2.1. Length 2.2. Width 2.3. Height 2.4. Diameter 2.5. Angles
3. Symbols	May include but not limited to: 3.1. NEC- National Electric Code 3.2. IEC -International Electrotechnical Commission 3.3. ASME - American Society of Mechanical Engineers 3.4. IEEE - Institute of Electrical and Electronics Engineers 3.5. ISA - Instrumentation System and Automation Society
4. Instruments/Equipment	4.1. Components/dividers 4.2. Drawing boards 4.3. Rulers 4.4. T-square 4.5. Calculator

EVIDENCE GUIDE

1. Critical aspect of competencies	Assessment requires evidence that the candidate: 1.1. selected correct technical drawing in line with job requirements 1.2. correctly identified the objects represented in the drawing 1.3. identified and interpreted symbols used in the drawing correctly 1.4. prepared/produced electrical/electronic drawings including all relevant specifications 1.5. stored diagrams/equipment
2. Method of assessment	Competency in this unit must be assessed through: 2.1. Practical tasks involving interpretation of a range of technical drawings 2.2. Oral questioning
3. Resource implication	3.1. Drawings 3.2. Diagrams 3.3. Charts 3.4. Plans
4. Context of Assessment	4.1 Assessment may be conducted in the workplace or in a simulated environment

UNIT TITLE : **APPLY QUALITY STANDARDS**

UNIT CODE : **ELC311204**

UNIT DESCRIPTOR : This unit covers the knowledge, skills, (and) attitudes and values needed to apply quality standards in the workplace. The unit also includes the application of relevant safety procedures and regulations, organization procedures and customer requirements

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Assess quality of received materials or components	1.1. Work instructions are obtained and work is carried out in accordance with standard operating procedures 1.2. Received ***materials or component parts*** are checked against workplace standards and specifications 1.3. Faulty material or components related to work are identified and isolated 1.4. ***Faults*** and any identified causes are recorded and/or reported to the supervisor concerned in accordance with workplace procedures 1.5. Faulty materials or components are replaced in accordance with workplace procedures	• Relevant production processes, materials and products • Characteristics of materials, software and hardware used in production processes • Quality checking procedures • Quality Workplace procedures • Identification of faulty materials related to work	• Reading skills required to interpret work instruction • Critical thinking • Interpreting work instructions
2. Assess own work	2.1. ***Documentation*** relative to quality within the company is identified and used 2.2. Completed work is checked against workplace standards relevant to the task undertaken 2.3. Faulty pieces are identified and isolated 2.4. Information on the quality and other indicators of production performance is recorded in accordance with workplace procedures 2.5. In cases of deviations from specified ***quality standards***, causes are documented and reported in accordance with the workplace' standards operating procedures	• Safety and environmental aspects of production processes • Fault identification and reporting • Workplace procedure in documenting completed work • Workplace Quality Indicators	• Carry out work in accordance with OHS policies and procedures

ELEMENT	PERFORMANCE CRITERIA ***Italicized Bold*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Engage in quality improvement	3.1. Process improvement procedures are participated in relation to workplace assignment 3.2. Work is carried out in accordance with process improvement procedures 3.3. Performance of operation or quality of product or service to ensure ***customer*** satisfaction is monitored	• Quality improvement processes • Company customers defined	• Solution providing and decision-making • Practice company process improvement procedure

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials/components	1.1. Materials may include but not limited to: 1.1.1. wires 1.1.2. cables, soldering lead 1.1.3. electrical tape 1.2. Components may include but not limited to: 1.2.1. ICs 1.2.2. Diodes
2. Faults	Faults may include but not limited to: 2.1. Components/materials not according to specification 2.2. Components/materials contain manufacturing defects 2.3. Components/materials do not conform with government regulation i.e., PEC, environmental code 2.4. Components/materials have safety defect
3. Documentation	3.1. Organization work procedures 3.2. Manufacturer's instruction manual 3.3. Customer requirements 3.4. Forms
4. Quality standards	4.1. Quality standards may relate but not limited to the following: 4.1.1. materials 4.1.2. component parts 4.1.3. final product 4.1.4. production processes
5. Customer	5.1. Co-worker 5.2. Supplier 5.3. Client 5.4. Organization receiving the product or service

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment must show that the candidate: 1.1. Carried out work in accordance with the company's standard operating procedures 1.2. Performed task according to specifications 1.3. Reported defects detected in accordance with standard operating procedures 1.4. Carried out work in accordance with the process improvement procedures
2. Method of assessment	2.1. The assessor may select two (2) of the following assessment methods to objectively assess the candidate: 2.1.1. Observation 2.1.2. Questioning 2.1.3. Practical demonstration
3. Resource implication	3.1. Materials and component parts and equipment to be used in a real or simulated electronic production situation
4. Context of Assessment	4.1. Assessment may be conducted in the workplace or in a simulated environment.

UNIT TITLE : **TERMINATE AND CONNECT ELECTRICAL WIRING AND ELECTRONICS CIRCUIT**
UNIT CODE : **ELC311206**
UNIT DESCRIPTOR : This unit covers the knowledge, skills, (and) attitudes and values needed to terminate and connect electrical wiring and electronic circuits

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and prepare for termination/ connection of electrical wiring/electronics circuits	1.1. ***Materials*** are checked according to specifications and tasks 1.2. Appropriate ***tools and equipment*** are selected according to tasks requirements 1.3. Task is planned to ensure OH & S guidelines and procedures are followed 1.4. Electrical wiring/electronic circuits are correctly prepared for connecting/termination in accordance with instructions and work site procedures	• Use of tools • Use of test instruments/ equipment • Electrical theory • Principals of AC and DC • OH & S guidelines and procedures • Basic electrical and electronic devices	• Reading skills required to interpret work instruction • Checking materials for conformance to specifications • Checking existing and new installation site for correct location and specification
2. Terminate/ connect electrical wiring/ electronic circuits	2.1. Safety procedures in using tools are observed at all times and appropriate ***personal protective equipment*** are used 2.2. Work is undertaken safely in accordance with the workplace and standard procedures 2.3. Appropriate range of ***methods*** in termination/ connection are used according to specifications, manufacturer's requirements and safety 2.4. Correct sequence of operation is followed 2.5. ***Accessories*** used are adjusted, if necessary 2.6. Confirmed termination/connection is undertaken successfully in accordance with job specification	• Wiring techniques • OH & S principles • Use of lead-free soldering technology • Surface mount soldering techniques • Specifications and methods for terminating different materials	• Communication skills • Marking, tagging and labeling requirements for cables, wires, conductors and connections • Soldering techniques • Adjusting and fixing wiring supports

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Test termination/ connections of electrical wiring/ electronics circuits	3.1. Testing of all completed termination/ connections of electric wiring/electronic circuits is conducted for compliance with specifications and regulations using appropriate procedures and equipment 3.2. Wiring and circuits are checked using specified testing procedures 3.3. Unplanned events or conditions are responded to in accordance with established procedures	• AC and DC power supplies • Uses of diagnostic equipment • Tests for wiring and connections • Wiring support techniques and alternatives	• Printed circuit board repair and techniques • Electronic assembly functional and quality testing • Testing of wiring and connections for conformance to specification

RANGE OF VARIABLES

VARIABLE	RANGE
1. Materials	1.1 Materials included the following but not limited to: 1.1.1 Soldering lead 1.1.2 Cables 1.1.3 Wires
2. Tools and equipment	2.1 Tools for measuring, cutting, drilling, assembling/disassembling. Tool set includes the following but not limited to: 2.1.1 Pliers 2.1.2 Cutters 2.1.3 Screw drivers 2.2 Equipment 2.2.1 Soldering gun 2.2.2 Multi-tester
3. Personal protective equipment	3.1 goggles 3.2 gloves 3.3 apron/overall
4. Methods	4.1 Clamping 4.2 Pin connection 4.3 Soldered joints 4.4 Plugs
5. Accessories	5.1 Accessories may include the following but not limited to: 5.1.1 brackets 5.1.2 clamps

EVIDENCE GUIDE

1. Critical aspect of competency	Assessment requires evidence that the candidate: 1.1. Undertook work safely and according to workplace and standard procedures 1.2. used appropriate termination/ connection methods 1.3. followed correct sequence in termination / connection process 1.4. conducted testing of terminated connected electrical wiring/electronic circuits using appropriate procedures and standards
2. Method of assessment	2.1. The assessor may select two (2) of the following assessment methods to objectively assess the candidate: 2.1.1. Observation 2.1.2. Oral Questioning 2.1.3. Practical demonstration
3. Resource implication	3.1. Tools for measuring, cutting, drilling, assembling/disassembling, connecting. Tool set includes the following but not limited to: 3.1.1. screw drivers 3.1.2. pliers 3.1.3. cutters
4. Context of Assessment	4.1. Assessment may be conducted in the workplace or in a simulated work environment

CORE COMPETENCIES

UNIT OF COMPETENCY: **PERFORM ROUGHING-IN ACTIVITIES, WIRING AND CABLING WORKS FOR SINGLE-PHASE DISTRIBUTION, POWER, LIGHTING AND AUXILIARY SYSTEMS**

UNIT CODE : **ELC741301**

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on ***installing*** electrical metallic and non-metallic conduit, wire ways and cable clamp, auxiliary terminal cabinet and distribution frame panel board/safety switch and used in roughing-in based on the required performance standards.

This unit also covers the outcomes required in preparing for cable pulling and installation, performing wiring and cabling lay-out and notifying completion of work for single-phase distribution, power, lighting and auxiliary systems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS

1. Install electrical metallic /non-metallic (PVC conduit)	1.1 Correct drawings are interpreted based on job requirements
	1.2 Correct quantities of ***conduit, fittings*** and ***accessories*** are determined as per job requirements
	1.3 ***Tools and equipment*** are selected as per job requirements
	1.4 Conduit is assembled ensuring that fittings are fully inserted and tightened as per job requirements
	1.5 Conduit is bent with bends not exceeding 90° as per job requirements
	1.6 Conduit couplings and elbows are installed as per job requirements
	1.7 Conduit is threaded in line with job requirements
	1.8 Safety procedures are followed in line with standard operating procedures (SOPs)
		• Interpretation of
		  ○ electrical wiring diagrams
		  ○ mechanical drawings
		• Types of electrical conduits
		• Proper uses and installation of conduits
		• Technics in installing and bending of conduits and fittings
		• Proper Installation for maintenance accessibility
		• Safe use of adhesives
		• Proper use of safety harness (PPE)
			• Reading skills required to interpret work instructions
			• Handling of materials and tools and equipment
			• Lay-outing conduits
			• Bending electrical metallic conduits
			• Cutting conduits
			• Performing the installation
			• economically

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
2. Install wire ways and cable tray	2.1 Correct drawings are interpreted to determine job requirements 2.2 Correct quantities of materials are selected as per job requirements 2.3 Tools and equipment are selected as per job requirements 2.4 Wire ways and cable trays are installed as per job requirements. 2.5 Safety procedures are followed in line with SOPs	• Mensuration • Blue print reading • Materials specification • Use of materials, tools and equipment • Interpretation of an electrical and mechanical drawing. • Proper uses and installation of wire ways and cable trays • Suitability for installation and used of bus way, cable tray, fittings and panels in conformity with the provision of the PEC. • Proper use of safety harness (PPE)	• Interpreting technical plan • Effective communication skills (written and oral) • Effective use of measuring devices • Installing wire ways and cable tray
3. Install auxiliary terminal cabinet and distribution panel	3.1 Correct drawings are interpreted to determine job requirements 3.2 Correct quantities of materials are selected as per job requirements 3.3 Tools and equipment are selected as per job requirements 3.4 Auxiliary terminal cabinet is installed as per job requirements 3.5 Auxiliary main distribution frame is installed as per job requirements 3.6 Safety procedures are followed in line with SOPs	• Mensuration • Blue print reading and materials specification • Use of wires and cables and tools, • Interpretation of electrical and mechanical drawing • Proper procedure in installation of auxiliary terminal cabinet and distribution panels. • Proper use of safety harness and PPE	• Interpreting technical plan • Effective communication skills (written and oral) • Effective use of measuring devices • Installing different types of panel/frame
4. Prepare for cable pulling and installation	4.1 Necessary tools, equipment, materials and personal protective equipment (PPE) are prepared in line with job requirements. 4.2 Cable pulling & installation requirements and constraints from plan and site inspection are identified as per job requirements. 4.3 Cable lay out & installation equipment is set up in accordance with	• Mensuration • Blue print reading and materials specification • Use of wires, cables and tools • Preparation of required size of cable based on PEC Wire Table • Cable pulling and installation requirements • Cable lay out and	• Interpreting technical plan • Effective communication skills (written and Oral) • Effective use of measuring devices • Interpreting plans and drawings • Handling of

ELEMENT	PERFORMANCE CRITERIA *Italicized* terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
	manufacturer's and job requirements. 4.4 Site is made safe and secure for cable installation. 4.5 Suitable protective clothing is selected and required safety devices are used 4.6 Support structure is assessed as safe for normal working conditions.	installation	materials, tools and equipment • Applying methods and techniques in various type of wiring wires and cables • Pulling of conductors
5. Perform wiring and cabling lay out	5.1 Safety procedures are followed based on safety regulations PPE are identified and selected in line with safety requirements 5.2 Tools, equipment, pulling compound and safety requirements are identified and obtained for the lay out and installation. 5.3 Pulling materials is properly installed and tensioned to required specifications 5.4 Cable is secured permanently to support structure in accordance with standard installation procedures 5.5 Bending radius and loops tolerance is observed for cable materials at all times 5.6 Schedule of wire cutting lists is followed based on estimates, quantity and sizes to avoid wastage. 5.7 Further instructions are sought if unplanned events or conditions occur 5.8 Checking of quality of work is done in accordance with instructions and requirements.	• DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry • Wiring procedure such as cable lay-out, pulling splicing and termination of wire. • Uses of different type of wires and cables and its applications • Markings of Circuit homeruns. • Application of pulling compound • Bundling of wire size as per job requirement.	• Applying methods and techniques in various type of wiring wires and cables • Wiring-up the required electrical control based on the standard. • Connecting and terminating of motor terminal/ leads out and the control devices. • Checking for continuity test or ohmmeter test of motor terminal. • Terminating wires • Performing the installation economically.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
6. Notify completion of work	6.1 Final checks are made to ensure that work conforms with instructions and job requirements 6.2 Supervisor is notified upon completion of work 6.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures 6.4 Work area is cleaned up and made safe according to OHSA regulations	• Processes, Operations, Systems o Maintenance of tools o Storage of tools • Checking and Conforming procedures in installation based on job requirement • Good housekeeping	• Skills in continuity test or ohmmeter test of motor terminal. • commissioning skills • Documentation and reporting skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Metallic conduits/non-metallic conduit	1.1 Rigid Steel Conduits (RSC) 1.2 Intermediate Metallic Conduit (IMC) 1.3 Electrical Metallic Tubing (EMT) 1.4 Polyvinyl Chloride Pipe (PVC)
2. Fittings	2.1 Condulets and Reducers 2.2 lock nut and bushing 2.3 Entrance cap 2.4 Nipple 2.5 Elbow
3. Accessories	2.1 Boxes • Utility Box • Junction Box • Pull box/Splice box 2.2 Conduit supports (e.g. hangers) 2.3 Conduit Strap 2.4 Connectors (straight and angle)
4. Tools and equipment	Including but not limited to: 3.1 Spirit level, hack saw, pipe cutter, plumb bob, pipe reamer, pipe threader, pipe bender, bolt cutter, electric drill 3.2 Electrical power tools - Power drills - Portable grinder
4. Installation	4.1 Electrical Metallic conduit - Fitting/coupling/connector fully inserted and tightened - Elbows with clamps/supports for mounting - Conduit rigidly anchored to building structure - Smooth field off-set bends - Conduit bend not to exceed 90° - Standard distance between supports - Conduit ends reamed and without sharp edges - Conduit cut to length requirement 4.2 Wire ways and cable tray - Boxes plumb to ground and rigidly anchored to walls building structure - Conduit rigidly clamp to building structure - Couplings fully inserted - Ground wire bonding jumper each joint. 4.3 Auxiliary terminal cabinet and distribution panel. - Conduit ends reamed and cleaned of burrs and rough edges - Fitting fully inserted and applied with adhesive solvent - Conduit cut to length requirement - PVC coupling with adhesive solvent

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Installed electrical metallic /non- metallic (PVC conduit) 1.2 Installed wire ways and cable tray 1.3 Installed auxiliary terminal cabinet and distribution panel 1.4 Prepared for cable pulling and installation 1.5 Performed wiring and cabling lay out 1.6 Notified completion of work
2. Resource Implications	The following resources **MUST** be provided: 2.1 Workplace location 2.2 Tools and equipment appropriate to roughing-in, wiring and cabling works and installation processes 2.3 Materials relevant to the proposed activity 2.4 Drawings and specifications relevant to the task
3. Methods of Assessment	Competency must be assessed through: 3.1 Direct observation of application to tasks. 3.2 Questions related to underpinning knowledge 3.3 Demonstration 3.4 Written test
4. Context for Assessment	4.1 Competency may be assessed in the workplace or in a simulated workplace setting 4.2 Assessment shall be done while the tasks are being undertaken either individually or as part of a team under limited supervision

UNIT OF COMPETENCY : INSTALL ELECTRICAL PROTECTIVE DEVICES FOR DISTRIBUTION, POWER, LIGHTING, AUXILIARY, LIGHTNING PROTECTION AND GROUNDING SYSTEMS

UNIT CODE : ELC7413302

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on planning and preparing work, installing electrical protective devices, lightning fixture and auxiliary outlet and notifying completion of work for distribution, power, lighting, auxiliary, lightning protection and grounding systems.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
1. Plan and 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 **PPE** needed to install electrical wiring are identified, checked to ensure they work correctly 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.	• Types of protective devices and its applications/ applications • Identification of standard drawing based on standard (ANSI or IEC) • Protective devices specifications • Electrical protection system components	• Interpreting plans and details drawing. • Handling of materials, tools and equipment
2. Install electrical protective devices	2.1 ***Safety procedures*** are followed in line with job requirements 2.2 Correct procedures for ***installation*** of ***electrical protective devices*** 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	• DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry • Philippine Electrical Code (PEC) requirements regarding installation of electrical protection devices • Uses of different protective devices- o panelboard; o circuit breaker; o safety switch; o ground fault current interrupting device (GFCI); and o conventional atmospheric lightning protection and grounding system	• Interpreting plans and details drawing. • Applying methods and techniques in installation of various type of protective devices and lightning protection and grounding systems • Performing the installation economically.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Install lighting fixture and auxiliary outlet.	3.1 Safety procedures are followed 3.2 Correct procedures for installation of ***lighting fixture*** and auxiliaries are performed in line with job requirements 3.3 Schedule of work is followed to ensure work is completed in an agreed time, to a quality standard and with a minimum waste 3.4 Further instructions are sought from a supervisor if unplanned events or conditions occur. 3.5 On-going checks of quality of work are undertaken in accordance with instructions and requirements.	• DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry • Philippine Electrical Code (PEC) requirements regarding installation of lighting fixture and auxiliary outlet • Types of lighting fixtures and installation technique • Ratings of lighting fixture	• Interpreting plans and details • Handling of materials, tools and equipment • Interpreting product technical brochure • Applying methods and techniques in installation of various type of lighting fixture and auxiliary outlet
4. Notify completion of work.	4.1 Final checks are made to ensure the work conforms with instructions and requirements 4.2 Supervisor is notified upon completion of work 4.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures 4.4 Work area is cleaned and made safe	• Processes, Operations, Systems o Maintenance of tools o Storage of tools • Checking and conforming procedures for installation based on job requirement • Good housekeeping	• Skills in continuity test or ohmmeter test of motor terminal. • commissioning skills • Documentation and reporting skills

RANGE OF VARIABLES

VARIABLE	RANGE
1. Tools and equipment	Tools and equipment may include but not limited to: 5.1 Pliers 5.2 Screwdrivers 5.3 Wrenches 5.4 Wire splicers 5.5 Electrician knives 5.6 electric drill 5.7 Ball hammer
2. Personal protective equipment (PPE)	2.1 Working gloves 2.2 Safety shoes 2.3 Hard hat
3. Safety procedures	Safety procedures included in: 3.1 Philippine Electrical Code 3.2 Safety standards
4. Installation	4.1 Horizontally and vertically aligned 4.2 Rigidly anchored to wall 4.3 Installed with clearance to wall/other boxes for cover to open freely 4.4 Enough clearance for cover opening for flush mounted
5. Electrical protection system component	5.1 Safety switch 5.2 Earth Leakage Circuit Breaker (ELCB) 5.3 Conventional atmospheric lightning protection 5.4 Grounding system
6. lighting fixture	6.1 Lamps 6.2 Spotlights 6.3 Track lights 6.4 Perimeter lighting

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 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 protective devices 1.5 Demonstrated correct procedures on installation of lighting fixture and auxiliary outlet 1.5 Followed safety procedures/protocol 1.6 Cleaned worksite, tools and equipment 1.7 Stored surplus materials
2. Resource Implications	The following resources **MUST** be provided: 2.1 Workplace location 2.2 Tools and equipment appropriate for installation of electrical protection systems 2.3 Materials relevant to the proposed activity 2.4 Drawings and specifications relevant to the task
3. Methods of Assessment	Competency must be assessed through: 3.1 Direct observation of candidate's application of knowledge to tasks. 3.2 Questions related to underpinning knowledge 3.3 Demonstration/Practical activity 3.4 Written test
4. Context for Assessment	4.1 Competency may be assessed in the workplace or in simulated workplace setting 4.2 Assessment shall be observed while the tasks are being undertaken either individually or as part of a team under limited supervision

UNIT OF COMPETENCY : INSTALL WIRING DEVICES OF FLOOR AND WALL MOUNTED OUTLETS, LIGHTING FIXTURE/SWITCHES AND AUXILLIARY OUTLETS

UNIT CODE : ELC741303

UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes on selecting and installing wiring devices, installing lighting fixtures/switches and notifying completion of work of floor and wall mounted outlets and auxiliary outlets.

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
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 consumable items*** 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	• Blue print reading • Materials specification • Types and uses of electrical wiring devices, tools and equipment • Proper PPEs	• Interpreting plans and details • Handling of materials, tools and equipment • Communication (written and oral) • Selecting wiring devices
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 is done in accordance with instructions and requirements.	• Installation procedures of various wiring devices • DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry • PEC requirement regarding installation of wiring devices	• Applying methods and techniques in various type of wiring devices • Checking and conforming the installation based on job requirement

ELEMENT	PERFORMANCE CRITERIA ***Italicized*** terms are elaborated in the Range of Variables	REQUIRED KNOWLEDGE	REQUIRED SKILLS
3. Install lighting fixture/ switches	3.1 Safety procedures are followed 3.2 Correct procedures for ***installation of lighting fixtures/switches*** are performed in line with job requirements 3.3 Schedule of work is followed to ensure work is completed in an agreed time, to a quality standard and with a minimum waste 3.4 Further instructions are sought from a supervisor if unplanned events or conditions occur 3.5 On-going checks of quality of work are undertaken in accordance with instructions and requirements	• Types of lighting fixtures and installation technique • Installation procedures of various lighting fixtures/switches • Ratings of lighting fixture • DOLE Department Order No. 13 s. 1998 Guidelines Governing Occupational Safety and Health in the Construction Industry • PEC requirement regarding installation of various lighting fixtures/switches	• Applying methods and techniques in various type of lighting fixtures/ switches • Checking and conforming the installation based on job requirement • Installing lighting fixture and switches
4. Notify completion of work	4.1 Final checks are made to ensure that work conforms with instructions and to requirements 4.2 Supervisor is notified upon completion of work 4.3 Tools, equipment and any surplus resources and materials are, where appropriate, cleaned, checked and returned to storage in accordance with established procedures 4.4 Work area is cleaned and made safe	• Processes, Operations, Systems o Maintenance of tools o Storage of tools • Checked and conformed the installation based on job requirement • Good housekeeping	• Performing commissioning activity

RANGE OF VARIABLES

VARIABLE	RANGE
1. Wiring devices and consumable items	1.1 Wiring devices 1.1.1 Floor outlet 1.1.2 Ground fault current interrupting device 1.1.3 Grounding type convenience outlet 1.1.4 Light switches 1.2 Consumable items 1.2.1 Wire nut 1.2.2 Electrical tape 1.2.3 rubber tape
2. Tools and equipment	2.1 Pliers 2.2 Screwdrivers 2.3 Wire splicers 2.4 Electrician knives
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	Includes Safety procedures in: 4.1 Philippine Electrical Code 4.2 Safety standards
5. Installation of wiring devices	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
6 Installation of lighting fixtures/switches	6.1 Lamps - Horizontally aligned against wall - No gap between ceiling and lighting fixture base - Wiring at junction box cut to requirement as required - Lamps securely mounted 6.2 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 6.3 Track Lights - Wiring at junction box cut to requirement as required - Track light mounted securely 6.4 Perimeter Lighting - Perimeter lighting installed as per plan/shop - Foundation constructed as per plan - Fixture wired and tested - Fixture mounted to pole

EVIDENCE GUIDE

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Correctly interpreted work instructions 1.1 Selected appropriate tools, equipment and materials for installing wiring devices and lighting fixtures/switches and auxiliary outlet 1.3 Selected and used correct PPE 1.2 Demonstrated correct procedures for installation of wiring devices and lighting fixtures/switches 1.5 Followed safety procedures/protocol 1.6 Cleaned worksite, tools and equipment 1.7 Stored surplus materials
2. Resource Implications	The following resources **MUST** be provided: 2.1 Workplace location 2.2 Tools and equipment appropriate for installation of wiring devices and lighting fixtures/switches 2.3 Materials relevant to the proposed activity 2.4 Drawings and specifications relevant to the task
3. Methods of Assessment	Competency must be assessed through: 3.1 Direct observation of application of tasks 3.2 Questions related to underpinning knowledge 3.3 Demonstration/Practical activity 3.4 Written test
4. Context for Assessment	4.1 Competency may be assessed in the workplace or in a simulated workplace setting 4.2 Assessment shall be observed while the tasks are being undertaken either individually or as part of a team under limited supervisions

SECTION 3 TRAINING ARRANGEMENTS

These standard arrangement are developed to give technical and vocational education and training (TVET) provides information and guidance on important requirements needed when designing training programs for Electrical Installation and Maintenance NC II.

These include information on curriculum design, training delivery, trainee entry requirements, tools and equipment, training facilities and trainer's qualification.

3.1 CURRICULUM DESIGN

TESDA shall provide the training on the development of competency-based curricula to training providers. This will equip them with needed knowledge and skills in developing their own curricula based on the components mentioned below.

Delivery of knowledge requirements for the basic, common and core units of competency specifically in the areas of mathematics, science/technology, communication/language and other academic subjects shall be contextualized. To this end, TVET providers shall develop a Contextual Learning Matrix (CLM) to accompany their curricula.

Course Title: Electrical Installation and Maintenance NC Level: **NC II**

Nominal Training Hours:

18 Hours (Basic competencies)
24 Hours (Common competencies)
154 Hours (Core competencies)

Total: 196 Hours

Course Description:

This course is designed to equip individuals with operational skills in Electrical Installation & Maintenance NC level II particularly in installing and maintaining electrical wiring, lighting and related equipment/systems in residential houses/buildings where the voltage does **not exceed 600 volts**.

To complete the course, all units prescribed for this qualification must be achieved:

BASIC COMPETENCIES (18 Hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
1. Participate in workplace communication	1.1 Obtain and convey workplace information	• Describe Organizational policies	• Group discussion	• Oral evaluation	2 Hours
		• Read: o Effective communication o Written communication o Communication procedures and systems • Identify: o Different modes of communication o Medium of communication o Flow of communication o Available technology relevant to the enterprise and the individual's work responsibilities	• Lecture	• Written examination	
		• Prepare different Types of question • Gather different sources of information • Apply storage system in establishing workplace information • Demonstrate Telephone courtesy	• Demonstration	• Observation	
	1.2 Complete relevant work related documents	• Describe Communication procedures and systems	• Group discussion	• Oral evaluation	1 hour
		• Read: o Meeting protocols o Nature of workplace meetings o Workplace interactions o Barriers of communication	• Lecture	• Written examination	

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Complete work related documents	• Demonstration	• Observation	
		• Read instructions on work related forms/documents	• Lecture	• Written examination	
		• Practice: o Estimate, calculate and record routine workplace measures o Basic mathematical processes of addition, subtraction, division and multiplication	• Demonstration	• Observation	
		• Demonstrate office activities in: o workplace meetings and discussions scenario • Perform workplace duties scenario following simple written notices	• Role play	• Oral evaluation • Observation	
		• Follow simple spoken language	• Demonstration	• Observation	
		• Identify the different Non-verbal communication	• Lecture	• Written examination	
		• Demonstrate ability to relate to people of social range in the workplace • Gather and provide information in response to workplace requirements	• Demonstration	• Observation	
	1.3 Participate in workplace meeting and discussion	• Identify: o types of workplace documents and forms o kinds of workplace report o Available technology relevant to the enterprise and the individual's work responsibilities	• Lecture	• Written examination	1 hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		• Read and follow instructions in applying basic mathematical concepts			
		• Follow simple spoken language • Demonstrate ability to relate to people of social range in the workplace • Gather and provide information in response to workplace requirements	• Demonstration	• Observation	
2. Work in a team environment	2.1 Describe and identify team role and responsibility in a team.	• Describe the team role and scope	• Group discussion	• Oral evaluation	2 Hours
		• Read o Definition of Team o Difference between team and group o Objectives and goals of team • Identify different sources of information	• Lecture	• Written examination	
	2.2 Describe work as a team	• Describe team goals and objectives	• Group discussion	• Oral evaluation	2 Hours
		• Perform exercises in setting team goals and expectations scenario	• Role play	• Oral evaluation • Observation	
		• Identify: o individual role and responsibility	• Lecture	• Written examination	
		• Practice Interacting effectively with others • Read: o Fundamental rights at work including gender sensitivity o Understanding individual competencies relative to teamwork	• Group discussion • Lecture	• Oral evaluation • Written examination	

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
		○ Types of individuals ○ Role of leaders			
3. Practice career professionalism	3.1 Integrate personal objectives with organizational goals	• Describe performance evaluation	• Group discussion	• Oral evaluation	2 Hours
		• Read: ○ Work values and ethics (Code of Conduct, Code of Ethics, etc.) ○ Understanding personal objectives ○ Understanding organizational goals	• Lecture	• Written examination	
		• Demonstrate Intra and Interpersonal skills at work • Demonstrate personal commitment in work	• Demonstration	• Observation	
	3.2 Set and meet work priorities	• Describe company policies, operations, procedures and standards	• Group discussion	• Oral evaluation	2 Hours
		• Read: ○ Time Management ○ Basic strategic planning concepts ○ Resource utilization and management	• Lecture	• Written examination	
		• Apply managing goals and time • Practice: ○ economic use of resources and facilities ○ time management	• Demonstration	• Observation	

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	3.3 Maintain professional growth and development	• Describe company recognition and incentives	• Group discussion	• Oral evaluation	2 Hours
		• Read: o Career development opportunities o Information on relevant licenses and or certifications o personal career development needs • Identify career opportunities	• Lecture	• Written examination	
		• Determine personal career development needs	• Group discussion	• Oral evaluation	
4. Practice occupational health and safety	4.1 Identify hazard and risks	• Describe OHS procedures, practices and regulations	• Group discussion	• Oral evaluation	1 hour
		• Read o OHS indicators o Organizational contingency practices • Practice hazards/risks identification and control	• Lecture	• Written examination	
	4.2 Evaluate hazard and risks	• Describe effects of safety hazards	• Group discussion	• Oral evaluation	1 hour
		• Read o Threshold Limit Value –TLV	• Lecture	• Written examination	
		• Practice reporting safety hazards	• Role play	• Observation	
		• Demonstrate evaluating hazards and risks using communication equipment	• Demonstration	• Observation	

Unit of Competency	Learning Outcomes	Learning Activities	Methodology	Assessment Approach	Nominal Duration
	4.3 Control hazards and risks	• Describe : o Organization safety and health protocol o Company emergency procedure practices	• Group discussion	• Oral evaluation	1 hour
		• Practice personal hygiene	• Demonstration	• Observation	
		• Practice drills on responding to emergency	• Demonstration • Simulation	• Observation	
	4.4 Maintain occupational health and safety awareness	• Identify emergency-related drills information	• Lecture	• Written examination	1 hour
		• Practice occupational safety and health standards on personal records in the workplace	• Role play	• Observation	
		• Practice emergency related drills in the workplace	• Demonstration • Simulation	• Observation	

COMMON COMPETENCIES (24 Hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Use Hand Tools	1.1 Plan and prepare for tasks to be undertaken	• Identification of different types of hand tools and their uses • Function, operation and common faults in electrical/ electronic hand tools • Planning and preparing task/activity	▪ Lecture / Demonstration ▪ Distance education ▪ Film Showing	▪ Written/Oral examination ▪ Practical demonstration	1 hours
	1.2 Prepare hand tools	• Proper use of hand tools • Checking and safety requirements in handling tools • Standard procedures in checking, identification and marking of safe or unsafe/ faulty tools • Identifying and checking hand tools • Marking of safe or unsafe/ faulty hand tools	▪ Lecture / Demonstration ▪ Distance education ▪ Film Showing	▪ Written/Oral examination ▪ Practical demonstration	1 hours
	1.3 Use appropriate hand tools and test equipment.	• Safety requirements in using electronics hand tools and test equipment • Familiarizing usage of electrical/electronic hand tools for adjusting, dismantling, assembling, finishing, and cutting • Processes, Operations, Systems o Proper usage and care of hand tools o Types and uses of test equipment • Identification of common faults in the use of hand tools • Applying safety handling of hand tools and test equipment • Using appropriate hand tools and test equipment for the job requirement	▪ Lecture / Demonstration ▪ Distance education ▪ Film Showing	▪ Written/Oral examination ▪ Practical demonstration	2 hours
	1.4 Maintain hand tools	• Safety requirements in maintenance of hand tools • Processes, Operations, Systems o Maintenance of tools o Storage of hand tools • Procedures in maintaining hand tools • Applying 5S principles in maintenance of hand tools	▪ Lecture / Demonstration ▪ Distance education ▪ Film Showing	▪ Written/Oral examination ▪ Practical demonstration	1 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
2. Perform Mensurations and Calculation	2.1 Select measuring instruments;	• Types of measuring tools and its uses • Selecting measuring instruments	▪ Self- paced/ modular ▪ Demonstration ▪ Small group discussion	▪ Written/Oral examination ▪ Practical demonstration	1 hours
	2.2 Carry-out measurements and calculations	• Measurements o Linear measurement o Geometrical measurement • Calculations o Trade Mathematics o Unit conversion o Ratio and proportion o Area • Interpreting formulas for volume, areas, perimeters of plane and geometric figures • Performing measurement • Computing measurement formulas	▪ Self- paced/ modular ▪ Demonstration ▪ Small group discussion	▪ Written/Oral examination ▪ Practical demonstration	2 hours
	2.3 Maintain measuring instruments	• Safe handling procedures in using measuring instruments • Procedures on maintenance of measuring instruments • Handling and maintaining measuring instruments	▪ Self- paced/ modular ▪ Demonstration ▪ Small group discussion	▪ Written/Oral examination ▪ Practical demonstration	1 hours
3. Prepare and Interpret Technical Drawing	3.1 Identify different kinds of technical drawings	• Types of technical drawings • Technical drawing applications • Mark up/Notation of Drawings • Identifying type of drawing • Evaluating mark-up/ notation of drawings • Interpreting signs and symbols	▪ Lecture ▪ demonstration ▪ Film Viewing ▪ Individualized Learning	▪ Written /oral ▪ examinations ▪ Direct observation ▪ Project method ▪ interview	1 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration

	3.2 Interpret technical drawing	• Blueprint Reading and Plan Specification
		• Electrical/Electronic symbols and abbreviations
		• Trade Theory
		  ○ Types of electrical/electronic product plans
		  ○ Notes and specifications
		• Interpreting technical drawing and plans for electrical/electronics
		• Matching specification details with existing resources
			▪ Lecture
			▪ demonstration
			▪ Film Viewing
			▪ Individualized Learning
			▪ Direct Student Laboratory Experience
				▪ Written /oral
				▪ examinations
				▪ Direct observation
				▪ Project method
				▪ Interview
					1 hours

	3.3 Prepare/ make changes to electrical/ electronic schematics and drawings	• Freehand sketching techniques
		• Pictorial drawing
		• Drawing conventions
		• Dimensioning conventions
		• Mathematics
		  ○ Four fundamental operations
		  ○ Percentage
		  ○ Fraction
		  ○ Algebra
		  ○ Geometry
		• Sketching drawings and plans
		• Sketching pictures
		• Computing formulas
		• Using drawing instruments
			▪ Lecture
			▪ demonstration
			▪ Film Viewing
			▪ Individualized Learning
			▪ Direct Student Laboratory Experience
				▪ Written /oral
				▪ examinations
				▪ Direct observation
				▪ Project method
				▪ Interview
					2 hours

	3.4 Store technical drawings and equipment/ instruments	• Effective ways to catalogue and store technical drawings
		• Manual methods of handling, storing and maintaining paper drawings
		• Storing drawing in digital forms
		  ○ Scanner
		  ○ CAD
		• Handling and storing of drawings
		• scanning and storing drawings in digital form
		• Handling and storing drawing instruments
			▪ Lecture
			▪ demonstration
			▪ Film Viewing
			▪ Individualized Learning
			▪ Direct Student Laboratory Experience
				▪ Written /oral
				▪ examinations
				▪ Direct observation
				▪ Project method
				▪ Interview
					1 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
4. Apply Quality Standards	4.1 Assess quality of received materials	• Relevant production processes, materials and products • Characteristics of materials, software and hardware used in production processes • Quality checking procedures • Quality Workplace procedures • Identification of faulty materials • Checking quality of materials or component parts as per manufacturer's standards • Interpreting specifications or symbols	▪ Field trip ▪ Symposium ▪ Video clips ▪ Simulation/ Role playing ▪ On the job training	▪ Written test ▪ Demonstration & questioning ▪ Observation & questioning	1 hours
	4.2 Assess own work	• Safety and environmental aspects of production processes • Fault identification and reporting • Workplace procedure in documenting completed work • Workplace Quality Indicators • Observing safety and environmental aspects of production processes • Preparing technical reports • Performing procedures in the workplace	▪ Field trip ▪ Symposium ▪ Film showing ▪ Simulation ▪ On the job training	▪ Demonstration & questioning ▪ Observation & questioning ▪ Third party report	2 hours
	4.3 Engage in quality improvement	• Quality improvement processes • IEC/ISO standards • Environmental and safety standards • Implementing continuous improvement	▪ Field trip ▪ Symposium ▪ Film showing ▪ Simulation ▪ On the job training	▪ Demonstration & questioning ▪ Observation & questioning ▪ Third party report	2 hours
5. Terminate and Connect Electrical wiring and Electronic Circuit	5.1 Plan and prepare for termination/ connection of electrical wiring/ electronics circuits	• Use of hand tools and test instruments / equipment • Basic Electrical theory and application • OH & S guidelines and procedures • Basic electrical and electronic devices • Preparing hand tools and test equipment for termination • Preparing electrical/electronic materials for termination	▪ Film Viewing ▪ Individualized Learning ▪ Direct Student Laboratory Experience ▪ On the Job Training ▪ Project Method	▪ Demonstration and Questioning ▪ Assessment of Output Product	1 hour

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	5.2 Terminate/ connect electrical wirings/ electronic circuits	• Electrical wirings o Wiring techniques o OH & S principles o Specifications and methods for terminating different materials • Electronics circuits o Soldering techniques and procedures o OH & S principles o Surface mount soldering techniques o Use of lead-free soldering technology • Performing different types of splices • Perform soldering techniques and procedures	▪ Film Viewing ▪ Individualized Learning ▪ Direct Student Laboratory Experience ▪ On the Job Training ▪ Project Method	▪ Demonstration and Questioning ▪ Assessment of Output Product	2 hours
	5.3 Test termination/ connections of electrical wiring/ electronics circuits	• Use of diagnostic equipment • Continuity testing and grounding o Electrical o Electronics • Functionality test o Electrical o Electronics • Performing continuity test • Performing functionality test	▪ Film Viewing ▪ Individualized Learning ▪ Direct Student Laboratory Experience ▪ On the Job Training ▪ Project Method	▪ Demonstration and Questioning ▪ Assessment of Output Product	2 hours

CORE COMPETENCIES
(154 Hours)

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
1. Perform roughing-in, wiring and cabling works for single-phase distribution, power, lighting and auxiliary systems	1.1 Install electrical metallic /non-metallic (PVC conduit)	• Interpret electrical wiring diagrams and mechanical drawings • Identify proper usage and types of conduits, fittings in electrical installation. • Identify technique of installation and bending of conduit and fitting. • Apply proper usage of safety harness. • Interpret plan and details drawing. • Practice proper handling of materials, tools and equipment • Practice procedure in proper bending of conduits • Practice procedure in Installing conduits • Perform the installation economically	• Lecture • Demonstration • Modular (self-paced) • Dualized-training • PowerPoint/Video presentation	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Project method • Practical Lab/ Exercises	16 hours
	1.2 Install wire ways and cable tray	• Identify use of materials, tools and equipment • Interpret electrical/mechanical drawing • Determine suitability for installation and used of bus way, cable tray, fittings and panels, conformity with the provision of the PEC Code. • Practice wire way and cable tray installation • Practice proper use of safety harness (PPE) • Interpret technical plan • Use effective communication skills (written and oral) • Practice effective use of measuring tape • Perform the installation economically	• Lecture • Demonstration • Modular (self-paced) • Dualized-training • PowerPoint/Video presentation	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Project method • Practical Lab/ Exercises	16 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	1.3 Install auxiliary terminal cabinet and distribution panel	• Learn and apply mensuration • Determine blue print reading and materials specification. • Read proper proofing standards • Perform proper procedure in installation of auxiliary terminal cabinet and distribution panel. • Apply proper use of safety harness (PPE). • Interpret technical plan • Practice effective use of measuring devices • Practice proper handling of tools and equipment • Install terminal cabinet and distribution panel • Perform the installation economically.	• Lecture • Demonstration • Modular (self-paced) • Dualized-training • PowerPoint/Video presentation	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Project method • Practical Lab/ Exercises	12 hours
	1.4 Prepare for cable pulling and installation	• Read and familiarize: o mensuration o blue print reading and materials specification. o uses of wires, cables and tools o required sizes of cable based on PEC Wire Table • Prepare cable for installation • Interpret technical plan and drawing. • Practice effective use of measuring tapes • Practice proper handling of tools and equipment • Apply methods and techniques in various type of wiring wires and cables.	• Lecture • Demonstration • Modular (self-paced) • Dualized-training • PowerPoint/Video presentation	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Practical Lab/ Exercises	6 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
	1.5 Perform wiring and cabling lay out	• Read and familiarize: o Mensuration o Blue print reading and materials specification o Application of pulling compound o Methods in cable pulling • Interpret technical plan and drawing. • Apply methods in cable pulling • Follow procedures in bending radius and loop tolerances for cables.	• Lecture • Demonstration • Modular (self-paced) • Dualized-training • Group discussion • PowerPoint/Video presentation	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Project method • Practical Lab/ Exercises	16 hours
	1.6 Notify completion of work	• Describe processes, Operations Systems - Maintenance of tools & materials - Storage of tools • Check and conform the installation based on job requirement • Practice good housekeeping. • Perform commissioning activities	• Lecture • Demonstration • Modular (self-paced) • Group discussion	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Practical Lab/ Exercises	4 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration

2. Install electrical protective devices for distribution, power, lighting, auxiliary, lightning protection and grounding systems	2.1 Plan and prepare work	• Read and familiarize:
		  ○ Types of protective devices and its applications
		  ○ Identification of standard drawing based on standard (ANSI or IEC)
		  ○ Protective devices specifications and ratings
		• Interpret plans & detail drawing
		• Describe proper handling of materials, tools and equipment
		• Check and quantify item as needed in the job requirement
		• Apply active and non-active test to ensure its functionality of the devices.
			• Lecture
			• Demonstration
			• Modular (self-paced)
			• Dualized-training
			• Group discussion
			• PowerPoint/Video presentation
				• Written test or examination
				• Direct observation and questioning
				• Demonstration (able to impart knowledge and skills)
					8 hours

	2.2 Install electrical protective devices	• Read and familiarize:
		  ○ Guidelines Governing Occupational Safety and Health in the Construction Industry.
		  ○ Types and usage of different electrical protective devices
		• Perform procedures for installation of electrical protective devices
		• Perform selection of electrical protective devices as per job requirements
		• Practice good housekeeping
		• Apply methods and techniques in various types of protective devices and lightning protection and grounding systems
		• Terminate and mount devices.
		• Check and conform the installation based on job requirement
		• Perform the installation economically.
			• Lecture
			• Demonstration
			• Modular (self-paced)
			• Dualized-training
			• Group discussion
			• PowerPoint/Video presentation
				• Written test or examination
				• Direct observation and questioning
				• Demonstration (able to impart knowledge and skills)
				• Project method
				• Practical Lab/ Exercises
					16 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration

	2.3 Install lighting fixture and auxiliary outlet	• Read and familiarize:
		  ○ Guidelines Governing Occupational Safety and Health in the Construction Industry.
		  ○ Types and usage of different lighting fixture and auxiliary outlet
		• Perform procedures for installation of lighting fixture and auxiliary outlet
		• Perform selection of lighting fixture and auxiliary outlet as per job requirements
		• Practice good housekeeping
		• Interpret plans and details
		• Practice proper handling of materials, tools and equipment
		• Apply methods and techniques in various types of lighting fixture and auxiliary outlet
		• Check and conforming the installation based on job requirement
			• Lecture
			• Demonstration
			• Modular (self-paced)
			• Dualized-training
			• Group discussion
			• PowerPoint/Video presentation
				• Written test or examination
				• Direct observation and questioning
				• Demonstration (able to impart knowledge and skills)
				• Project method
				• Practical Lab/ Exercises
					16 hours

	2.4 Notify completion of work	• Describe Processes, Operations Systems
		  ○ Maintenance of tools & materials
		  ○ Storage of tools
		• Check and conform the installation based on job requirement
		• Practice good housekeeping.
		• Perform commissioning activities
			• Lecture
			• Demonstration
			• Modular (self-paced)
			• Dualized-training
			• Group discussion
				• Written test or examination
				• Direct observation and questioning
				• Demonstration (able to impart knowledge and skills)
				• Practical Lab/ Exercises
					4 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration
3. Install wiring devices of floor and wall mounted outlets, lighting fixtures/switches and auxiliary outlets	3.1 Select wiring devices	• Determine materials specification • Identify types and usage of electrical wiring devices and consumable items • Interpret electrical drawing and wiring diagram. • Describe function of every devices used in the line/job requirements • Check and quantify the item needed in the job requirement. • Check the required rating based on its specification in accordance with standard.	• Lecture • Demonstration • Modular (self-paced) • Dualized-training • Group discussion • PowerPoint/Video presentation	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Project method • Practical Lab/ Exercises	4 hours
	3.2 Install wiring devices	• Read and familiarize: o Setting of lay-out and dimension of electrical drawing or wiring diagram. o Materials specification as per job requirements. o Proper installation of wiring devices. o Good housekeeping. • Apply methods and techniques in installation of various type of wiring devices • Practice proper handling of materials, tools and equipment • Perform the installation economically.	• Lecture • Demonstration • Modular (self-paced) • Dualized-training • Group discussion • PowerPoint/Video presentation	• Written test or examination • Direct observation and questioning • Demonstration (able to impart knowledge and skills) • Project method • Practical Lab/ Exercises	16 hours

Unit of Competency	Learning Outcomes	Learning Activities	Methodologies	Assessment Methods	Nominal Duration

	3.3 Install lighting fixtures/switches	• Read and familiarize:
		  ○ Guidelines Governing Occupational Safety and Health in the Construction Industry.
		  ○ Types and usage of different lighting fixtures/switches
		• Perform procedures for installation of lighting fixture/switches
		• Perform selection of lighting fixtures/ switches as per job requirements
		• Practice good housekeeping
		• Interpret plans and details
		• Practice proper handling of materials, tools and equipment
		• Apply methods and techniques in various types of lighting fixtures/ switches
		• Check and conform the installation based on job requirement
			• Lecture
			• Demonstration
			• Modular (self-paced)
			• Dualized-training
			• Group discussion
			• PowerPoint/Video presentation
				• Written test or examination
				• Direct observation and questioning
				• Demonstration (able to impart knowledge and skills)
				• Project method
				• Practical Lab/ Exercises
					16 hours

	3.4 Notify completion of work	• Describe Processes, Operations, Systems
		  ○ Maintenance of tools
		  ○ Storage of tools
		• Check and conform the installation based on job requirement
		• Practice good housekeeping
		• Perform commissioning activities
			• Lecture
			• Demonstration
			• Modular (self-paced)
			• Dualized-training
			• Group discussion
				• Written test or examination
				• Direct observation and questioning
				• Demonstration (able to impart knowledge and skills)
				• Practical Lab/ Exercises
					4 hours

3.2 TRAINING DELIVERY

1. The delivery of training shall adhere to the design of the curriculum and guided by the principles of competency-based TVET.

    a. Course design is based on competency standards set by the industry or recognized industry sector; (Learning system is driven by competencies written to industry standards)
    b. Training delivery is learner-centered and should accommodate individualized and self-paced learning strategies;
    c. Training can be done on an actual workplace setting, simulation of a workplace and/or through adoption of modern technology.
    d. Assessment is based in the collection of evidence of the performance of work to the industry required standards;
    e. Assessment of competency takes the trainee's knowledge and attitude into account but requires evidence of actual performance of the competency as the primary source of evidence.
    f. Training program allows for recognition of prior learning (RPL) or current competencies;
    g. Training completion is based on satisfactory performance of all specified competencies.

2. The competency-based TVET system recognizes various types of delivery modes, both on-and off-the-job as long as learning is guided by the competency standards specified by the industry. The following training modalities and its variations/components may be adopted singly or in combination with other modalities when designing and delivering training programs:

    2.1 Institution- Based:

    - **Dual Training System (DTS)/Dualized Training Program (DTP)** which contain both in-school and in-industry training or fieldwork components. Details can be referred to the Implementing Rules and Regulations of the DTS Law and the TESDA Guidelines on the DTP;

    - **Distance learning** is a formal education process in which majority of the instruction occurs when the students and instructor are not in the same place. Distance learning may employ correspondence study, audio, video, computer technologies or other modern technology that can be used to facilitate learning and formal and non-formal training. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

    - The **traditional classroom-based** or **in-center instruction** may be enhanced through use of learner-centered methods as well as laboratory or field-work components.

2.2 Enterprise-Based:

- **Formal Apprenticeship** – Training within employment involving a contract between an apprentice and an enterprise on an approved apprenticeable occupation.

- **Enterprise-based Training-** where training is implemented within the company in accordance with the requirements of the specific company. Specific guidelines on this mode shall be issued by the TESDA Secretariat.

2.3 Community-Based:

- **Community-Based** – short term programs conducted by non-government organizations (NGOs), LGUs, training centers and other TVET providers which are intended to address the specific needs of a community. Such programs can be conducted in informal settings such as barangay hall, basketball courts, etc. These programs can also be mobile training program (MTP).

3.3 TRAINEE ENTRY REQUIREMENTS

This section specifies the qualifications of trainees including their education/experience. To qualify as trainee for Electrical Installation & Maintenance NC II, a candidate:

- must have completed at least 10 yrs. basic education or an ALS certificate of achievement with grade 10 equivalent holder
- must be able to communicate both orally and in writing
- must be able to perform basic mathematical computation

The list does not include specific institutional requirements such as educational attainment, appropriate work experience, and others that may be required of the trainees by the school or training center delivering the TVET program.

3.4 LIST OF TOOLS, EQUIPMENT AND MATERIALS ELECTRICAL INSTALLATION & MAINTENANCE NC II

Recommended list of tools, equipment and materials for the training of 25 trainees for Electrical Installation & Maintenance NC II.

TOOLS		EQUIPMENT		MATERIALS	
QTY	ITEM	QTY	ITEM	QTY	ITEM
5 pcs.	Spirit level	5 units	Electric drill	25 pcs.	RSC/IMC
5 pcs.	Hack saw	5 units	Portable grinder	5 pcs.	Entrance cap
5 pcs.	Pipe cutter	5 units	Multi-tester	50 Pairs.	Locknut & bushing
5 pcs.	Pipe reamer	1 set	Fire alarm system (5units detector, 1 control panel)	5 pcs.	Ground Fault Current interrupting device (GFCI)
5 pcs.	Pipe threader	3 sets	Motion sensors	100 pcs.	3/16' x 1" Metal Screw
5 pcs.	Pipe bender	1 set	Security equipment Access Control	50 pcs.	Conduit strap/clamp
5 pcs.	Bolt cutter	1 set	CCTV (4 cameras, 1 DVR)	5 sets	Wiring boards, ¾ ft. x 4 ft. x 8 ft.
5 pcs.	Ball hammer	5 units	Clamp-on meter	10 pcs.	Floor outlet
25 pcs.	Electrician Pliers	1 unit	Insulation Resistance Tester	25 pcs.	Working gloves
25 pcs.	Screwdrivers set	1 unit	Earth resistance tester	10 pairs	Safety shoes
5 pcs.	Box Wrench	1 unit	Labeling machine	10 pcs.	Hard hat
5 pcs.	Wire splicer	1 unit	Fire extinguisher KGS ABC	10 pcs.	Safety goggles
5 pcs.	Wire stripper	1 unit	LCD Projector	5 boxes	Wire AWG #12, (3.5mm2)
5 pcs.	Electrician knife	1 unit	Laptop	5 boxes	Wire AWG #14(2.0mm2)
10 pcs.	Tools holster			5 rolls	Electrical tape
5 pcs.	Push-pull 0-5 mtrs			1 box	Wood screw ½" x 8
5 pcs.	Claw hammer			25 pcs.	Receptacle surface type
5 pcs.	Prick punch			25 pcs.	Receptacle flush type
5 pcs.	Heat gun 1200 watts			25 pcs.	Incandescent bulb 50 w/ 250V AC
5 pcs.	Heavy-duty soldering iron			25 sets	Convenient outlet c.o. (grounding type,/flush type) 2 gang w/ plate and cover
5 pcs.	Flat file smooth 8"			10 pcs.	PVC square box, 4 x 4
5 Kgs.	#16 G.I wire			25 mtrs	flexible conduit ½", ¾
1 pc.	Whiteboard 4 x 8 x ¾			10 pcs.	PVC conduit ½, ¾
1 pc.	Whiteboard 4 x 4 x ¾ with movable stand			25 pcs.	Junction box PVC
1 box	Whiteboard marker, assorted color			25 pcs.	Utility box
1 box	Push pin			50 pcs	Connectors PVC, ½
1 pc.	Pencil sharpener			50 pcs	Connectors PVC, ¾

TOOLS		EQUIPMENT		MATERIALS	
QTY	ITEM	QTY	ITEM	QTY	ITEM
25 pcs.	Pencil with eraser			50 pcs	Connectors RSC, ¾
2 kgs	Rags			20 pcs.	Elbow PVC ½
5 ltrs	Cleaning agent liquid			20 pcs.	Elbow PVC ¾
1 unit	First aid kit			20 pcs.	Elbow RSC ½
2 reams	Bond paper			20 pcs.	Elbow RSC ¾
5 pcs	Whiteboard eraser magnetic			5 sets	Panel board with 70 amp main and 4 branch ckt. ▪ 20 amps, 2 pcs. ▪ 15 amps, 2 pcs.
				10 pcs.	Switch (3 way with plate and cover)
				10 pcs.	Switch (single pole with plate and cover)

3.5 TRAINING FACILITIES
ELECTRICAL INSTALLATION & MAINTENANCE NC II

Based on a class intake of 25 students/trainees, below are the space requirement & their sizes:

TEACHING/LEARNING AREAS	SIZE IN METERS	AREA IN SQ. METERS	QTY	TOTAL AREA IN SQ. METERS
Lecture Area	5 x 8	40	1	40
Laboratory Area	5 x 8	40	1	40
Learning Resource Area	4 x 5	20	1	20
Tool Room / Storage Area	4 x 5	20	1	20
Wash ,Toilet & Locker Room	1 x 2	2	2	4
Total				124
Facilities / Equipment / Circulation**				38
Total Area				**162**

***** Area requirement is equivalent to 30% of the total teaching/learning areas***

3.6 TRAINER'S QUALIFICATIONS

To qualify as trainer for Electrical Installation & Maintenance NC II level, a person must:

- be a holder of NTTC I in Electrical Installation & Maintenance NC II (or higher)
- have at least 2-years relevant industry experience and/or teaching experience

3.7 INSTITUTIONAL ASSESSMENT

Institutional assessment is undertaken by trainees to determine their achievement of units of competency. A certificate of achievement is issued for each unit of competency.

The result of the institutional assessment may be considered as evidence for the assessment for national certification. As a matter of policy, graduates of programs registered with TESDA under this training regulation are required to undergo mandatory national competency assessment upon completion of the program.

SECTION 4. ASSESSMENT AND CERTIFICATION ARRANGEMENT

Competency Assessment is the process of collecting evidence and making judgments whether competency has been achieved. The purpose of assessment is to confirm that an individual can perform to the standards expected at the workplace as expressed in relevant competency standards.

The assessment process is based on evidence or information gathered to prove achievement of competencies. The process may be applied to an employable unit(s) of competency in partial fulfillment of the requirements of the national qualification.

4.1. NATIONAL ASSESSMENT AND CERTIFICATION ARRANGEMENTS

4.1.1. To attain the National Qualification of *Electrical Installation & Maintenance NC II*, the candidate must demonstrate competence in all the units listed in Section 1. Successful candidates shall be awarded a National Certificate II signed by the TESDA Director General.

4.1.2. The qualification of Electrical Installation & Maintenance NC II can be attained through demonstration of competence through project-type assessment covering all the required units of the qualification.

4.1.3. Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.

4.1.4. The following are qualified to apply for assessment and certification:

- Graduate of formal, non-formal and informal including enterprise-based education/training programs/courses.
- Experienced workers (wage employed or self-employed)

4.1.5. For those holders of existing National Certificate (NC) of individuals in Electrical Installation and Maintenance NC II, automatic conversion will be implemented.

4.1.6. Clustering of competencies is not applicable.

4.1.7. Individuals who already possess Certificate of Competency (COC) in Electrical Installation & Maintenance NC II are advised to take the assessment for this amended TR on or before the expiration of their COCs.

4.1.8. The guidelines on assessment and certification are discussed in detail in the “Procedures Manual on Assessment and Certification” and “Guidelines on the Implementation of the Philippine TVET Competency Assessment and Certification System (PTCACS)”.

4.2. COMPETENCY ASSESSMENT REQUISITE

4.2.1 *Self-Assessment Guide*. The self-assessment guide (SAG) is accomplished by the candidate prior to actual competency assessment. SAG is a pre-assessment tool to help the candidate and the assessor determine what evidence is available, where gaps exist, including readiness for assessment.

This document can:

a. Identify the candidate's skills and knowledge
b. Highlight gaps in candidate's skills and knowledge
c. Provide critical guidance to the assessor and candidate on the evidence that need to be presented
d. Assist the candidate to identify key areas in which practice is needed or additional information or skills that should be gained prior`

4.2.2 *Accredited Assessment Center*. Only Assessment Center accredited by TESDA is authorized to conduct competency assessment. Assessment centers undergo a quality assured procedure for accreditation before they are authorized by TESDA to manage the assessment for National Certification.

4.2.3 *Accredited Competency Assessor*. Only accredited competency assessor is authorized to conduct assessment of competence. Competency assessors undergo a quality assured system of accreditation procedure before they are authorized by TESDA to assess the competencies of candidates for National Certification.

ELECTRICAL INSTALLATION & MAINTENANCE NC II
COMPETENCY MAP

BASIC COMPETENCIES

Receive and 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 occupational health and safety procedures	Lead Workplace Communication	Lead Small Working Teams	Develop and Practice Negotiating Skills With Team Members	Guide Effective Solutions to Problems Arising from Work Activities	Check and Develop the Use of Mathematical Concepts & Techniques	Use Relevant Technologies Applicable to Assigned Work
Lead in Utilizing Specialized Communication Skills	Assist in Developing Team and Individuals	Apply Problem Solving Techniques in the Workplace	Collect, analyze and organize information	Plan and Organize Work for Several Working Teams	Promote Environmental Protection	

COMMON COMPETENCIES

Use Hand Tools	**Perform Mensuration and Calculation**	**Prepare and Interpret Technical Drawing**	**Apply Quality Standards**	**Perform Computer Operations**
Terminate and Connect Electrical Wiring and Electronic Circuits	**Observe Procedures, Specifications and Manuals of Instructions**	**Maintain Tools and Equipment**	**Test Electronic Components**	

CORE COMPETENCIES

Prepare electrical materials and tools	Perform roughing-in activities for basic electrical lay-out	Perform installation of wiring devices for power, lights & auxiliary outlets	Perform installation of wiring devices	Perform installation of lighting fixtures	Perform installation of basic electrical protection systems	Perform installation of basic auxiliary outlets and lighting fixtures	Perform commissioning on low voltage electrical systems
Perform roughing-in activities wiring and cabling works for single-phase distribution system, power, lighting and auxiliary.		**Install electrical protective devices for distribution of power, lighting, auxiliary and to include lightning protection and grounding systems**		**Install wiring devices of floor and wall mounted outlets, lighting fixtures/switches and auxiliary outlet.**			

GLOSSARY OF TERMS

GENERAL

1) **Certification -** is the process of verifying and validating the competencies of a person through assessment
2) **Certificate of Competency (COC)** – is a certification issued to individuals who pass the assessment for a single unit or cluster of units of competency
3) **Common Competencies** - are the skills and knowledge needed by all people working in a particular industry
4) **Competency** - is the possession and application of knowledge, skills and attitudes to perform work activities to the standard expected in the workplace
5) **Competency Assessment -** is the process of collecting evidence and making judgments on whether competency has been achieved
6) **Competency Standard (CS)** - is the industry-determined specification of competencies required for effective work performance
7) **Context of Assessment** - refers to the place where assessment is to be conducted or carried out
8) **Core Competencies -** are the specific skills and knowledge needed in a particular area of work - industry sector/occupation/job role
9) **Critical aspects of competency -** refers to the evidence that is essential for successful performance of the unit of competency
10) **Elective Competencies -** are the additional skills and knowledge required by the individual or enterprise for work
11) **Elements** - are the building blocks of a unit of competency. They describe in outcome terms the functions that a person performs in the workplace.
12) **Evidence Guide** - is a component of the unit of competency that defines or identifies the evidences required to determine the competence of the individual. It provides information on critical aspects of competency, underpinning knowledge, underpinning skills, resource implications, assessment method and context of assessment
13) **Level -** refers to the category of skills and knowledge required to do a job
14) **Method of Assessment** - refers to the ways of collecting evidence and when, evidence should be collected
15) **National Certificate (NC)** – is a certification issued to individuals who achieve all the required units of competency for a national qualification defined under the Training Regulations. NCs are aligned to specific levels within the PTQF
16) **Performance Criteria** - are evaluative statements that specify what is to be assessed and the required level of performance

17) **Qualification** - is a cluster of units of competencies that meets job roles and is significant in the workplace. It is also a certification awarded to a person on successful completion of a course in recognition of having demonstrated competencies in an industry sector

18) **Range of Variables** - describes the circumstances or context in which the work is to be performed

19) **Recognition of Prior Learning (RPL)** – is the acknowledgement of an individual's skills, knowledge and attitudes gained from life and work experiences outside registered training programs

19) **Resource Implication -** refer to the resources needed for the successful performance of the work activity described in the unit of competency. It includes work environment and conditions, materials, tools and equipment

20) **Basic Competencies -** are the skills and knowledge that everyone needs for work

21) **Training Regulations (TR)** – refers to the document promulgated and issued by TESDA consisting of competency standards, national qualifications and training guidelines for specific sectors/occupations. The TR serves as basis for establishment of qualification and certification under the PTQF. It also serves as guide for development of competency-based curricula and instructional materials including registration of TVET programs offered by TVET providers

22) **Underpinning Knowledge -** refers to the competency that involves in applying knowledge to perform work activities. It includes specific knowledge that is essential to the performance of the competency

23) **Underpinning Skills** - refers to the list of the skills needed to achieve the elements and performance criteria in the unit of competency. It includes generic and industry specific skills

24) **Unit of Competency** – is a component of the competency standards stating a specific key function or role in a particular job or occupation; it is the smallest component of achievement that can be assessed and certified under the PTQF

SECTOR SPECIFIC

1) **Technical Terms**. All technical terms are used with meanings as defined in the latest published edition of the Philippine Electrical Code, in applicable laws, such as R.A. 7920 (The New Electrical Engineering Law), and current electrical engineering practice.

2) **Other Terms**. All other terms are used as defined in applicable TESDA documents.

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