Competency Standard (CS)

Electrical Installation & Maintenance

Level-2

Construction Sector

Competency Standard Code: CS-CON-EIM-L2-EN-V2

National Skills Development Authority
Chief Advisor's Office
Government of the People's Republic of Bangladesh

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This Competency Standard for **Electrical Installation & Maintenance** is a document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the document for providing training consistent with the requirements of industry in order to meet the qualification of individuals who graduated through the established standard via competency-based assessment for a relevant job.

This document has been developed by NSDA in association with **Construction Sector**, industry representatives, academia, related specialist, trainer and related employee.
Public and private institutions may use the information contained in this standard for activities benefitting Bangladesh.

Introduction

The NSDA aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skills ecosystem and delivery mechanism through a combination of well-defined set of mechanisms and necessary technical supports.

Key priority economic growth sectors identified by the government have been targeted by NSDA to improve current job skills along with existing workforce to ensure required skills to industry standards. Training providers are encouraged and supported to work with industry to address identified skills and knowledge to enable industry growth and increased employment through the provision of market responsive inclusive skills training program. "**Electrical Installation & Maintenance**" is selected as one of the priority occupations of **Construction** Sector. This standard is developed to adopt a demand driven approach to training with effective inputs from Industry Skills Councils (ISC's), employer associations and employers.

Generally, a competency standard informs curriculum, learning materials, assessment and certification of trainees enrolled in Skills training. Trainees who successfully pass the assessment will receive a qualification in the National Skills Qualification Framework (BNQF) under Bangladesh National Qualification Framework and will be listed on the NSDA's online portal.
This competency standard is developed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

The document also details the format, sequencing, wording and layout of the Competency Standard for an occupation which is comprised of Units of Competence and its corresponding Elements.

Overview

A **Competency Standard** is a written specification of the knowledge, skills and attitudes required for the performance of an occupation, trade or job corresponding to the industry standard of performance required in the workplace.
The purpose of a competency standards is to:

- provide a consistent and reliable set of components for training, recognising and assessing people's skills, and may also have optional support materials
- enable industry recognised qualifications to be awarded through direct assessment of workplace competencies
- encourage the development and delivery of flexible training which suits individual and industry requirements
- encourage learning and assessment in a work-related environment which leads to verifiable workplace outcomes

Competency standards are developed by a working group comprised of representative from NSDA, Key Institutions, ISC, and industry experts to identify the competencies required of an occupation in **Construction Sector**.

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.
With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.
Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

Units of competency are documented in a standard format that comprises of:

- unit title
- nominal duration
- unit code
- unit descriptor
- elements and performance criteria
- variables and range statement
- curricular content guide
- assessment evidence guide

Together, all the parts of a unit of competency:

- describe a work activity
- guide the assessor to determine whether the candidate is competent or not yet competent

The ensuing sections of this document comprise of a description of the relevant occupation, trade or job with all the key components of a unit of competency, including:

- a chart with an overview of all Units of Competency for the relevant occupation, trade or job including the Unit Codes and the Unit of Competency titles and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performance Criteria, Range of Variables, Curricular Content Guide and Assessment Evidence Guide.

Competency Standards for National Skill Certificate – 2 in Electrical Installation & Maintenance in Construction Sector

Level Descriptors of Skills Sector, BNQF Level 1-6

Level & Job classification	Knowledge Domain	Skills Domain	Responsibility Domain
6-Mid-Level Manager/ Sub Assistant Engineer	Comprehensive actual and theoretical knowledge within a specific work or study area with an awareness of the validity and limits of that knowledge, able to analyze, compare, relate and evaluate.	Specialised and wider range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems. Communicate professional issues and solutions to the team and to external partners/users.	Work under broad guidance and self-motivation to execute strategic and operational plan/s. Lead lower-level management. Diagnose and resolve problems within and among work groups.
5-Supervisor	Broad knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to scrutinize and break information into parts by identifying motives or causes.	Broad range of cognitive and practical skills required to generate solutions to specific problems in one or more work or study areas. Communicate practice-related problems and possible solutions to external partners.	Work under guidance of management and self-direction to resolve specific issues. Lead and take responsibility for the work and actions of group/team members. Bridge between management.
4-Highly Skilled Worker	Broader knowledge of the underlying, concepts, principles, and processes in a specific work or study area, able to solve problems to new situations by comparing and applying acquired knowledge.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying the full range of methods, tools, materials and information. Communicate using technical terminology and IT technology with partners and users as per workplace requirements.	Work under minimal supervision in specific contexts in response to workplace requirements. Resolve technical issues in response to workplace requirements and lead/guide a team/ group.
3-Skilled Worker	Moderately broad knowledge in a specific work or study area, able to perceive ideas and abstract from drawing and design according to workplace requirements.	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools. Communicate with his team and limited external partners upholding the values, nature and culture of the workplace	Work or study under supervision with considerable autonomy. Participate in teams and responsible for group coordination.
2-Semi Skilled Worker	Basic understanding of underpinning knowledge in a specific work or study area, able to interpret and apply common occupational terms and instructions.	Skills required to carry out simple tasks, communicate with his team in the workplace presenting and discussing results of his work with required clarity.	Work or study under supervision in a structured context with limited scope of manipulation
1 –Basic Skilled Worker	Elementary understanding of ability to interpret the underpinning knowledge in a specific study area, able to interpret common occupational terms and instructions.	Specific Basic skills required to carry out simple tasks. Interpret occupational terms and present the results of own work within guided work environment/ under supervision.	Work under direct supervision in a structured context with limited range of responsibilities.

List of Abbreviations

CS	-	Competency Standard
ISC	-	Industry Skills Council
FPS	-	Foot, Pound and Second
CONISC	-	Construction Industry Skills Councils
NSDA	-	National Skills Development Authority
MKS	-	Meter, Kilogram and Second
BNQF	-	Bangladesh National Qualification Framework
OSH	-	Occupational Safety and Health
PPE	-	Personal Protective Equipment
SCVC	-	Standards and Curriculum Validation Committee
STP	-	Skills Training Provider
SOP	-	Standard Operating Procedure
UoC	-	Unit of Competency
EIM	-	Electrical Installation & Maintenance
4 iR	-	4th Industrial Revolution

Approved by

40th Authority Meeting of NSDA

Held on 26.02.2025

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Competency Standards for National Skill Certificate – 2 in
Electrical Installation & Maintenance
Course Structure

SL.	Unit Code and Title		UoC Level	Nominal Hours
Generic Units of Competencies				**35**
1.	GU-04-L1-V1	Work in a Team Environment	1	20
2.	GU-02-L2-V1	Carryout Workplace Interaction	2	15
Sector Specific Units of Competencies				**20**
3.	SU-CON-02-L2-V1	Interpret Drawings and Specifications in Construction Manuals	2	20
Occupation Specific Units of Competencies				**265**
4.	OU-CON-EIM-01-L2-V2	Perform Concealed Work	2	60
5.	OU- CON EIM-02-L2-V2	Perform Conduit Wiring	2	70
6.	OU- CON EIM-03-L2-V2	Install Socket	2	45
7.	OU- CON-EIM-04-L2-V2	Perform Circuit Test	2	40
8.	OU- CON-EIM-05-L2-V2	Perform Electrical Home Appliance Repairing	2	50
			Learning Hours	**320**
			Workplace Visit	**20**
			Total Nominal Hours	**340**

Units & Elements at a Glance:

Generic Units of Competencies (35 hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GU-04-L1-V1	Work in a Team Environment	1. Define team role and scope. 2. Identify individual role and responsibility 3. Participate in team discussions 4. Work as a team member	20
GU-02-L2-V1	Carryout Workplace Interaction	1. Interpret workplace communication and etiquette 2. Read and understand workplace documents 3. Participate in workplace meetings and discussions 4. Practice professional ethics at workplace	15
Total Hours			**35**

Sector Specific Units of Competencies (20 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
SU-CON-02-L2-V1	Interpret Drawings and Specifications in Construction Manuals	1. Identify information from manuals 2. Identify drawings and specifications 3. Interpret drawings and specifications 4. Store manuals	20
Total Hours			**20**

Occupation Specific Units of Competencies (265 Hours)

Code	Unit of Competency	Elements of Competency	Hours
OU-CON-EIM-01-L2-V2	Perform Concealed Work	1. Prepare for works 2. Perform grove cutting 3. Perform switch box installation 4. Install junction box 5. Lay conduit in the roof 6. Maintain workplace, tools, equipment and materials	60
OU- CON EIM-02-L2-V2	Perform Conduit Wiring	1. Prepare for work 2. Install electrical circuit 3. Install conduits 4. Install boards and other accessories of wiring 5. Test the wiring 6. Maintain workplace, tools and materials	70
OU- CON EIM-03-L2-V2	Install Socket	1. Prepare for works 2. Install two-pin socket 3. Install power socket 4. Maintain workplace, tools, equipment and materials	45
OU- CON -EIM-04-L2-V2	Perform Circuit Test	1. Prepare for works 2. Perform continuity test using insulation tester 3. Measure earth resistance using earth tester 4. Execute insulation resistance test 5. Maintain workplace, tools and equipment & materials	40
OU- CON -EIM-05-L2-V2	Perform Electrical Home Appliance Repairing	1. Prepare for works 2. Repair fan 3. Repair electric iron 4. Repair water pump 5. Repair rice cooker 6. Maintain workplace, tools, equipment and materials	50
Total Hours			**265**

Generic Units of Competencies

Unit Code and Title	GU-04-L1-V1: Work in a Team Environment
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSA) required in working in a team environment. It includes defining team role and scope, identifying individual role and responsibility. Participating in team discussions and working as a team member.
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Define team role and scope.	1.1. Role and objectives of the team are defined. 1.2. Team structure, responsibilities and reporting relations are identified from team discussions and other external sources.
2. Identify individual role and responsibility	2.1 Individual roles and responsibilities of **team members** are identified. 2.2 Reporting relationships among team members are defined and clarified. 2.3 Reporting relationships external to the team are defined and clarified.
3. Participate in team discussions	3.1 Ideas related to team plans are contributed. 3.2 Recommendations for improving team work are put forward.
4. Work as a team member	4.1. Effective forms of communication are used to interact with team members. 4.2. Communication channels are followed. 4.3. OHS practices are followed.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Sources of information	1.1 Standard Operating Procedures 1.2 Job Description 1.3 Operations Manual 1.4 Organizational Structure
2. Team Members	1.1 Coach/mentor 1.2 Supervisor/Manager 1.3 Peers/Colleagues 1.4 Employee representative
3. Workplace context	3.1 National Laws and Statutes 3.2 Standard Operating Procedures 3.3 Workplace Rules and Regulations
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 demonstrated knowledge in working in a team environment. 1.2 satisfied the requirements mentioned in the

	Performance Criteria and Range of Variables
2. Underpinning knowledge	2.1 Team Structure, Role and Responsibility 2.2 Individual Members' Roles and Responsibilities 2.3 Communication Flow and Reporting Structures 2.4 Team Planning 2.5 Interpersonal Communication Skills 2.6 Team Meeting Procedures 2.7 OHS Practices
3. Underpinning skills	3.1 Identifying the role and responsibility of the team 3.2 Identifying roles and responsibilities of individual members 3.3 Participating in team discussions 3.4 Working as a team member
4. Underpinning Attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in Workplace
5. Resource implications	5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials 5.5 Online communication
6. Methods of assessment	Methods of assessment may include but not limited to**:** 6.1. Workplace observation 6.2. Demonstration 6.3. Oral questioning 6.4. Written test 6.5. Portfolio
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated work place after Completion of the training module 7.2 Assessment should be done by NSDA certified assessor
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Unit Code and Title	GU-03-L2-V1: Carryout Workplace Interaction
Unit Descriptor	This unit covers the knowledge, skills and attitude required to carry out workplace interaction. It specifically includes interpreting workplace communication and etiquette, reading and understanding workplace documents, participating in workplace meetings and discussions and practicing professional ethics at workplace.
Nominal Hours	**15 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Interpret workplace communication and etiquette	1.1 Workplace code of conducts are interpreted as per organizational guidelines; 1.2 Appropriate lines of communication are maintained with supervisors and colleagues; 1.3 Workplace interactions are conducted in a **courteous manner** to gather and convey information; 1.4 Questions about routine **workplace procedures and matters** are asked and responded as required.
2. Read and understand workplace documents	2.1 Workplace documents are interpreted as per standard; 2.2 Assistance is taken to aid comprehension when required from peers / supervisors; 2.3 Visual information / symbols / signage's are understood and followed; *2.4* Specific and relevant information are accessed from **appropriate sources;** 2.5 Appropriate medium is used to transfer information and ideas.
3. Participate in workplace meetings and discussions	3.1 Team meetings are attended on time and meeting procedures and etiquette are followed; 3.2 Own opinions are expressed and others opinions are listened without interruption; 3.3 Inputs are provided consistent with meeting purpose and meeting outcomes are implemented.
4. Practice professional ethics at workplace	4.1 Responsibilities as a team member are demonstrated and kept promises and commitments made to others; 4.2 Tasks are performed in accordance with workplace procedures 4.3 Confidentiality is respected and maintained; 4.4 Situations and actions considered inappropriate or which present a conflict of interest are avoided
.Range of Variables	

Variable	**Range** (may include but not limited to):
1. Courteous manner	1.1 Effective questioning 1.2 Active listening 1.3 Speaking skills
2. Workplace procedures and matters	2.1 Notes 2.2 Agenda 2.3 Simple reports 2.3.1 Progress report 2.3.2 Incident report 2.4 Job sheets 2.5 Operational manuals 2.6 Brochures and promotional material 2.7 Visual and graphic materials 2.8 Standards 2.9 OSH information 2.10 Signs
3. Appropriate sources	3.1 HR Department 3.2 Managers 3.3 Supervisors
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspects of competency	1.1 Maintained workplace communication and etiquette 1.2 Followed workplace instructions and symbols 1.3 Followed team meeting and etiquette
2. Underpinning knowledge	2.1 Workplace communication and etiquette 2.2 Workplace documents, signs and symbols 2.3 Meeting procedure and etiquette
3. Underpinning skills	3.1 Maintaining workplace communication and etiquette 3.2 Following workplace instructions and symbols 3.3 Following team meeting and etiquette
4. Underpinning attitude	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace

5. Resource implications	The following resources must be provided: 5.1 Work place Procedure 5.2 Materials relevant to the proposed activity 5.3 All tools, equipment, material and documentation required. 5.4 Relevant specifications or work instructions
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre; 7.2 Assessment should be done by NSDA certified assessor.
Accreditation Requirements Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

Sector Specific Units of Competencies

Unit Code and Title	SU-LE-01-L2-V1: Interpret Drawings and Specifications in Construction Manuals
Unit Descriptor	This unit covers the knowledge, skill and attitude required to interpret drawings and specifications in construction manuals. It specifically includes the tasks of identifying information, identifying and interpreting drawings and specifications
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the Range of Variables.
1. Identify information from manuals	1.1 Appropriate manuals are identified and accessed. 1.2 Version and date of the manual are checked to ensure up-to-date specifications of tools, equipment, materials and procedures.
2. Identify drawings and specifications	2.1 Relevant **drawings** and **specifications** are correctly identified. 2.2 **Terms and abbreviations** are identified. 2.3 **Signs and symbols** are identified
3. Interpret drawings and specifications	3.1 Drawings and specifications are interpreted. 3.2 Schedules, dimensions and specifications contained in the drawings are interpreted.
4. Store manuals	4.1. Documents are collected and packed. 4.2. Documents are stored to prevent damage, and ready access and updating of information when required.
Range of Variables	
Variables	**Range** (may include but not limited to):
4. Drawings	2.1 Technical Drawings 2.2 Sketch
5. Specifications	3.1 Product specifications 3.2 Performance specifications 3.3 Method specifications
6. Terms and abbreviations	Refers to all terms and abbreviations associated with the construction sector
7. Signs and symbols	Include all signs and symbols associated with the construction sector
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: 1.1 Identified information from manuals 1.2 Identified drawings and specifications

	1.3 interpreted drawings and specifications in construction documents
2. Underpinning knowledge	2.1 Types of construction manuals 2.2 Identification of signs and symbols 2.3 Identification of units of measurement 2.4 Identification of units of conversion 2.5 Drawings and specifications 2.6 Terms and abbreviations used
3. Underpinning skills	3.1 Identifying appropriate manuals 3.2 Identifying drawings and specifications 3.3 Interpreting drawings and specifications 3.4 Storing manuals
4. Underpinning attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implications	5.1 Workplace (actual or simulated) 5.2 Tools and equipment appropriate to work activities 5.3 Drawings and specifications 5.4 Materials appropriate to the proposed activities.
6. Methods of assessment	Assessment methods may include but not limited to: 6.1 demonstration 6.2 oral questioning 6.3 written test 6.4 portfolio
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Occupation Specific Units of Competencies

Unit Code and Title	OU-CON-EIM-01-L2-V2: Perform Concealed Work
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to perform concealed work. It includes preparing for works, performing switch box installation, installing junction box, performing pipe fitting in the roof, performing grove cutting and maintaining workplace, tools, equipment and materials.
Nominal Hours	**60 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Prepare for works	1.1 **Safe work practices** are observed throughout the work 1.2 **Personal Protective Equipment (PPE)** is used. 1.3 Workplace is prepared as per job requirement. 1.4 **Tools** and **materials** are selected and collected as per job requirement.
2. Perform grove cutting	2.1 Wall is marked as per layout diagram. 2.2 Grove is cut using grinding machine and chisel- hammer.
3. Perform switch box installation	3.1 Wall is marked as per layout diagram. 3.2 Grove is cut using grinding machine and chisel- hammer. 3.3 Switch box is fitted into grove as per standard.
4. Install junction box	4.1 Wall is marked as per layout diagram. 4.2 Grove is cut using grinding machine and chisel- hammer. 4.3 Junction box is fitted into grove as per standard.
5. Lay conduit in the roof	5.1 Fitting points are marked as per drawing. 5.2 Pipes are laid on the roof as per drawing. 5.3 Pipes are connected with fittings. 5.4 Pipes are tighten using as per standard. 5.5 Terminal points of pipe are covered using paper to protect from cement / sand.
6. Maintain workplace, tools, equipment and materials	6.1 Work area is cleaned in accordance with workplace procedures. 6.2 Unused materials are stored for re-use or disposed following workplace procedures. 6.3 Waste and scrap materials are disposed with following workplace procedures. 6.4 Inventory of tools equipment are conducted and recorded as per checklist. 6.5 Tools and equipment are cleaned and stored as per manufacturer's recommendation in appropriate location.

Range of Variables	
Variable	**Range** (may include but not limited to):
1. Personal Protective Equipment (PPE)	1.1 Hand gloves 1.2 Helmet 1.3 Goggles 1.4 Safety shoes / Gumboot 1.5 Safety belt 1.6 Apron 1.7 Mask 1.8 Safety harness
2. Tools	2.1 Hammer 2.2 Combination pliers 2.3 Screwdrivers 2.4 Chisel 2.5 Grinding machine
3. Materials	3.1 GI Wire 3.2 Grinding disc 3.3 Pipe 3.4 Circular box 3.5 Elbow 3.6 Joint socket 3.7 Nail 3.8 Bend 3.9 Paper
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspect of competency	Assessment required evidences that the candidate: 1.1 used quality tools and instruments 1.2 handled multi meter 1.3 installed junction box 1.4 checked and tested polarity and continuity 1.5 connected pipes with fittings 1.6 identified the fault accordingly 1.7 repaired the fault as per identification fault.
2. Underpinning knowledge	2.1 Type of tools and instruments. 2.2 Using Multimeter / AVO meter. 2.3 Understanding the faults. 2.4 Types of tests. 2.5 Functions of celling fan, exhaust fan and rice cooker.

3. Underpinning skills	3.1 Handling AVO meter / multimeter. 3.2 Identifying fault. 3.3 Repairing fault. 3.4 Checking and testing polarity and continuity.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implication	The following resources must be available: 5.1 workplace (actual or simulated) 5.2 tools and equipment to joint and connection process 5.3 availability of materials.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

Unit Code and Title	OU-CON-EIM-02-L2-V2: Perform Conduit Wiring
Unit Descriptor	This unit covers the knowledge, Skills and attitudes required to perform conduit wiring. It specifically includes preparing for work, installing electrical circuit, installing conduits, installing boards and other accessories of wiring, testing the wiring and maintaining workplace, tools and materials
Nominal Hours	**70 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the Range of Variables.
1. Prepare for work	1.1. **Safe work practices** are observed throughout the work; 1.2. **PPEs** are collected and worn as per job requirement; 1.3. **Hand tools, power tools, equipment** and **materials** are checked for usability; 1.4. Drawings are collected and interpreted.
2. Install electrical circuit	2.1 One lamp is controlled by SPST, SPDT and Intermediate switch; 2.2 One calling bell is controlled from two point; 2.3 Tube Light is controlled using SPST switch; 2.4 Install Ceiling Fan with regulator is installed.
3. Install conduits	3.1 Layout is drawn on the wall as per drawing; 3.2 Grooves are cut as per drawing ; 3.3 Collected conduits are cut and set; 3.4 Conduits are installed on the wall and clamped; 3.5 Fish wires are measured and cut; 3.6 Fish wire is inserted.
4. Install boards and other accessories of wiring	4.1 **Boards** are collected and fitted; 4.2 Switches, sockets and fan regulator are fitted; 4.3 Switches, sockets and fan regulator are connected to the circuits; 4.4 Different types of f**ittings** are fitted ; 4.5 **MCB**, and **MCCB** are installed and connected.
5. Test the wiring	5.1 Polarity of wiring is checked; 5.2 Polarity is justified and checked each of the switches, fuses and circuit breakers; 5.3 Circuit breakers are disconnected; 5.4 All loads are connected and checked the continuity each of the switches and circuit breakers.
6. Maintain workplace, tools and materials	6.1 Tools, equipment and materials are cleaned as per standard operating procedure; 6.2 Defective tools and equipment are identified, separated and

	reported to the designated person; 6.3 Tools, equipment and materials are stored as per workplace procedure; 6.4 Workplace is cleaned as per workplace procedure; 6.5 Waste materials are disposed in the designated place.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Safe work practices	1.1 Use PPE 1.2 Use fire extinguisher 1.3 Response emergency situation 1.4 Identify hazard 1.5 Control hazards 1.6 Measure risk 1.7 Use first aid 1.8 Report uncontrolled hazards
2. Personal Protective Equipment (PPE)	2.1 Hand gloves 2.2 Helmet 2.3 Goggles 2.4 Safety shoes / Gumboot 2.5 Safety belt 2.6 Apron 2.7 Mask 2.8 Safety harness
3. Tools and equipment	3.1 Adjustable wrench 3.2 Wire stripper 3.3 C-clamp 3.4 Chisels: (a) Wooden, (b) Cold 3.5 Drill bits 3.6 Files: (a) Flat, (b) Round, (c) Half round 3.7 Hacksaw 3.8 Hammers: (a) Ball pin, (b) Claw 3.9 Hand drill 3.10 Measuring Tapes 3.11 Paint Brushes/Rollers 3.12 Pliers: (a) Combination Pliers, (b) cutting Pliers, (c) Diagonal cutting Pliers, (d) Long Nose Pliers, 3.13 Punches 3.14 Screwdrivers: (a) Star, (b) Flat, (c) Connecting 3.15 Tri square 3.16 Neon tester 3.17 Wire cutters 3.18 Wire gauge

	3.19 Set squares 3.20 Electrician knife 3.21 Ladder 3.22 Fish wire 3.23 Calculator 3.24 Multi meter/AVO meter 3.25 Electric hand drill machine 3.26 Hand grinders 3.27 Soldering iron
4. Materials	4.1 Conduit 4.2 Socket 4.3 GI Wire 4.4 Elbow 4.5 Bend 4.6 Circular box 4.7 Rowel plug 4.8 Saddle 4.9 Screw 4.10 Cable lugs 4.11 Cable tie 4.12 Thread ball and blue 4.13 Flexible conduit 4.14 Electric soldering lead 4.15 Insulating tape 4.16 Cable (PVC, VIR) 4.17 SPST switch 4.18 SPDT switch 4.19 Intermediate switch
5. Boards	5.1 Wooden board 5.2 Plastic boards
6. Fittings	6.1 **Conduit Fittings**: ▪ Elbows ▪ Tees ▪ Junction Boxes ▪ Circular box ▪ Socket base ▪ Switch board base ▪ PVC Socket ▪ PVC bend 6.2 **Cable Fittings**: ▪ Cable Glands ▪ Cable Ties

	6.3 **Light Fixtures and Accessories**: ▪ Light Bulb Holders ▪ Lamp Holders ▪ Ceiling Rose ▪ Pendant Holders
7. MCB and MCCB	7.1 Single pole MCB 7.2 Double pole MCB 7.3 MCCB 7.4 Triple pole with neutral MCB 7.5 Earth leakage circuit breaker (ELCB) 7.6 Residual Current Circuit Breaker (RCCB)
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency	
1. Critical Aspects of Competency	Assessment required evidence that the candidate: 1.1 prepared for work 1.2 installed conduits and set cables 1.3 installed boards and other accessories of wiring 1.4 test the wiring 1.5 maintained workplace, tools and materials
2. Underpinning Knowledge	2.1 Conduit wiring 2.2 Types and Function of MCB & MCCB 2.3 Earth leakage circuit breaker 2.4 Residual Current Circuit Breaker (RCCB) 2.5 Fish wire 2.6 Different types of fittings and fixtures 2.7 Types of switches, sockets, and ceiling rose, fittings and fixtures. 2.8 Specification checking. 2.9 Fittings and fixture installation procedure. 2.10 Procedure of performing tests 2.11 Wires and cable
3. Underpinning Skills	3.1 interpreting drawings & symbols 3.2 Using tools & equipment for installing fittings and fixtures 3.3 Checking specifications 3.4 Connecting terminals 3.5 Measuring electrical current and voltage
4. Underpinning Attitudes	4.1 Commitment to occupational health and safety 4.2 Promptness in carrying out activities 4.3 Sincere and honest to duties 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness

	4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers and seniors in workplace
5. Resource Implications	The following resources must be provided: 5.1 Workplace (simulated or actual) 5.2 Tools and equipment appropriate for work activities 5.3 Materials for work activities
6. Methods of Assessment	Methods of assessment may include but not limited to: 6.1 Written test 6.2 Demonstration 6.3 Oral questioning 6.4 Portfolio
7. Context of Assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	OU-CON-EIM-03-L2-V2: Install Socket
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to install socket. It includes preparing for works, installing two-pin socket, installing power socket and maintaining workplace, tools, equipment and materials.
Nominal Hours	**45 Hours**
Elements of Competency	**Performance Criteria** **Bold & italicized** terms are elaborated in the Range of Variables
1. Prepare for works	1.1 **Safe work practices** are followed throughout the work process 1.2 **Personal Protective Equipment (PPE)** is collected and worn as per job requirement. 1.3 Workplace is prepared as per job requirement. 1.4 **Tools** and **materials** are selected and collected as per job requirement.
2. Install two-pin socket	2.1 Insulation of cable terminal is removed using wire striper according to job requirement. 2.2 Upper part of the switch board from the base plate is separated. 2.3 Two pin socket and switch are fixed in the upper part of switch board firmly. 2.4 Phase cable is connected into the switch terminal of two pin socket firmly as per circuit diagram. 2.5 Neutral cable is connected with the neutral terminal of two pin socket as per circuit diagram. 2.6 Connection is checked as per diagram. 2.7 Electrical load must be switched OFF/ON while it is operated. 2.8 Electrical load must be kept within 5 Amp.

3. Install power socket	3.1 Insulation of cable terminal is removed using wire striper according to job requirement. 3.2 Upper part of the switch board from the base plate is separated. 3.3 Power socket is fixed firmly on socket base 3.4 Phase cable is connected into the switch terminal as per circuit diagram. 3.5 Neutral cable is connected with the neutral terminal of power socket as per circuit diagram. 3.6 Earth cable is connected with the earth terminal of power socket as per circuit diagram. 3.7 Power connection is checked as per diagram. 3.8 Minimum 2.5 rm cable size must be used for making connection of power socket. 3.9 Power sockets Load must be kept maximum 15 amp. 3.10 Electrical load must be switched OFF/ON while it is operated.
4. Maintain workplace, tools, equipment and materials	5.1 Work area is cleaned in accordance with workplace procedures. 5.2 Unused materials are stored for re-use or disposed following workplace procedures. 5.3 Waste and scrap materials are disposed with following workplace procedures. 5.4 Inventory of tools equipment are conducted and recorded as per checklist. 5.5 Tools and equipment are cleaned and stored as per manufacturer'srecommendationinappropriate location.
Range of Variables	
Variable	**Range** (may include but not limited to):
1. Personal Protective Equipment (PPE)	1.1 Helmet 1.2 Safety goggles 1.3 Mask 1.4 Apron 1.5 Hand gloves 1.6 Safety shoe

2. Tools	2.1 Multi Meter / AVO meter 2.2 Pliers set 2.3 Screwdriver set 2.4 Electrician knives 2.5 Neon tester 2.6 Hammer 2.7 Wire stripper 2.8 Drill machine
3. Materials	3.1 Two pin sockets 3.2 power sockets 3.3 Power socket base 3.4 Insulation tape 3.5 Wire / Cable 3.6 Measuring tape 3.7 Switch board 3.8 Switch 3.9 Screw 3.10 Rowel plug
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspect of competency	Assessment required evidences that the candidate: 1.1 interpreted correctly work instructions 1.2 selected appropriate tools & materials for Installing socket, and switch 1.1 installed two-pin socket 1.2 installed power socket 1.3 maintained workplace, tools, equipment and materials
2. Underpinning knowledge	2.1 Safe handling tools and equipment 2.2 Types of sockets, and switch as per job requirement. 2.3 Function of different types of socket, and switch as per job requirement. 2.4 Differences and uses of two pin and power sockets. 2.5 Loading capacity of socket, and switch as per job requirement.
3. Underpinning skills	3.1 Selecting and collecting appropriate socket, and switch as per job requirement. 3.2 Separating upper and lower part smoothly. 3.3 Connecting each terminal firmly. 3.4 Testing the circuit.

4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implication	The following resources must be available: 5.1 workplace (actual or simulated) 5.2 tools, equipment and materials relevant to the proposed activity or task workplace. 5.3 drawings and specifications relevant to the task.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of Assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	OU-CON-EIM-04-L2-V2: Perform Circuit Test
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to perform circuit test. It includes preparing for works, performing continuity test using insulation tester, measuring earth resistance using earth tester, executing insulation resistance test and maintaining workplace, tools, equipment and materials.
Nominal Hours	**40 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Prepare for works	1.1 **Safe work practices** are observed throughout the work procedure 1.2 **Personal Protective Equipment (PPE)** are collected and worn as per job requirement. 1.3 Workplace is prepared as per job requirement. 1.4 **Tools,** equipment and **materials** are selected & collected as per job requirement.
2. Perform continuity test using insulation tester	2.1 insulation tester is connected to the circuit as per work requirement 2.2 Standard RPM of insulation tester is checked and set to 120 rpm for analog insulation tester to get actual result of resistance. 2.3 result of voltage & resistance are checked by using digital insulation tester with standard procedure 2.4 Listed value is re-checked and disconnected the terminal followed by Occupational Safety and Health (OSH).
3. Measure earth resistance using earth tester	3.1 Earth electrode is connected to measure earth resistance with earth tester followed by OSH. 3.2 Current electrode is set into the ground from earth electrode as per mentioned drawing 3.3 Earth electrode is set at the middle place between the potential electrode and current electrode followed by the OSH. 3.4 Standard earth resistance is kept maximum 5 ohm for plane land and 8 ohms in the mountain area. 3.5 Listed value is re-checked and disconnected the electrode followed by OSH.

4. Execute insulation resistance test	4.1 Power supply is disconnected and the wire connection is separated from MCB / MCCB properly maintain the OSH. 4.2 Earth wire and testing wire are connected with insulation resistance tester and another terminal of testing wire is opened. 4.3 Insulation resistance is tested and recorded testing value
5. Maintain workplace, tools and equipment & materials	5.1 Work area is cleaned in accordance with workplace procedures. 5.2 Unused materials are stored for re-use or disposed following workplace procedures. 5.3 Waste and scrap materials are disposed with following workplace procedures. 5.4 Tools and equipment are cleaned and stored as per manufacturer's recommendation in appropriate location.
Range of Variables	
Variable	**Range** (may include but not limited to):
1. Safe work practices	1.1 Use PPE 1.2 Use fire extinguisher 1.3 Response emergency situation 1.4 Identify hazard 1.5 Control hazards 1.6 Measure risk 1.7 Use first aid 1.8 Report uncontrolled hazards and situations
2. Personal Protective Equipment (PPE)	2.1 Hand gloves 2.2 Helmet 2.3 Safety shoe 2.4 Goggles 2.5 Apron 2.6 Mask

3. Tools	3.1 Electrician knife 3.2 Measuring tape 3.3 Pliers: ▪ combination pliers, ▪ cutting pliers, ▪ diagonal cutting pliers, ▪ long nose pliers, 3.4 screwdrivers: (a) star, (b) flat, (c) connecting. 3.5 AVO meter 3.6 Multi meter 3.7 Insulation tester 3.8 Earth tester 3.9 Insulation tester
4. Materials	4.1 Wire 4.2 PVC tap 4.3 Earth electrode 4.4 Current electrode 4.5 Potential electrode

Evidence Guide

The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.

1. Critical aspect of competency	Assessment required evidences that the candidate: 1.1 prepared for works 1.2 performed continuity test using insulation tester 1.3 measured earth resistance using earth tester 1.4 executed insulation resistance test 1.5 maintain workplace, tools and equipment & materials
2. Underpinning knowledge	2.1 Function of earth and insulation & earth test. 2.2 Specification and measuring procedure of insulation tester. 2.3 proper measuring distance between current and potential spike 2.4 procedure of taking meter reading (when show '0' then to get 100% accuracy) for short circuit test. 2.5 procedure of taking meter reading (when show infinity once the two terminals are open) for open circuit test.

3. Underpinning skills	3.1 Using Personal Protective Equipment (PPE). 3.2 Collecting materials. 3.3 Preparing materials. 3.4 Measuring distance. 3.5 Connecting cables. 3.6 Installing electrodes. 3.7 Using tools and equipment. 3.8 Measuring the earth resistance and insulation resistance test.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implication	The following resources must be available: 5.1 workplace (actual or simulated) 5.2 tools, equipment and materials appropriate to proposed activities 5.3 drawing, specification and manuals
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of Assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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Unit Code and Title	**OU-CON-EIM-05-L2-V2: Perform Basic Repairing of Electrical Home Appliance**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to perform electrical home appliance repairing. It includes preparing for works, repairing fan, electric iron, water pump, repairing rice cooker and maintaining workplace, tools, equipment and materials.
Nominal Hours	**50 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Prepare for works	1.1 **Personal Protective Equipment (PPE)** is collected and worn as per job requirement; 1.2 Workplace is prepared as per job requirement; 1.3 **Tools** and **materials** are selected and collected as per job requirement.
2. Repair fan	2.1 Continuity is checked from power supply to switch using test lamp / multimeter; 2.2 Continuity of starting coil and running coil is checked using series lamp / multimeter; 2.3 Capacitor is checked using series lamp; 2.4 Abnormal sound and high temperature of the fan is checked; 2.5 Faults of the **fan** are identified as per checked result; 2.6 Faults of the fan are listed and repaired the all faults; 2.7 Performance of the fan is tested as per standard procedure.
3. Repair electric iron	3.1 Continuity is checked from power supply to switch using multimeter; 3.2 Auto thermostat contact is checked using Avo-meter; 3.3 Heating coil (element) is checked using series lamp / Avo-meter; 3.4 Faults of the iron are identified as per checked result; 3.5 Faults of the iron are listed and repaired the all faults; 3.6 Performance of the iron is as per standard procedure.

4. Repair water pump	4.1 Continuity is checked from power supply to switch using multimeter; 4.2 Starting coil, running coil and capacitor are checked using multimeter / testing lamp; 4.3 Abnormal sound and high temperature of the fan is checked; 4.4 Faults of the water pump are identified as per checked result; 4.5 Faults of the water pump are listed and repaired the all faults; 4.6 Performance of water pump is tested as per standard procedure.
5. Repair rice cooker	5.1 Continuity is checked from power supply to switch using test lamp / multimeter.; 5.2 Continuity of heating coil, thermostat and safety fuse are checked using series lamp / multimeter; 5.3 Faults of the rice cooker is identified as per checked result; 5.4 Faults of the rice cooker are listed and repaired the all faults; 5.5 Performance of the rice cooker is tested as per standard procedure.
6. Maintain workplace, tools, equipment and materials	6.1 Work area is cleaned in accordance with workplace procedures; 6.2 Waste and scrap materials are disposed with following workplace procedures; 6.3 Tools and equipment are cleaned and stored as per manufacturer's recommendation in an appropriate location.

Range of Variables	
Variable	**Range** (may include but not limited to):
1. Personal Protective Equipment (PPE)	1.1 Hand gloves 1.2 Helmet 1.3 Goggles 1.4 Safety shoes 1.5 Safety belt 1.6 Apron 1.7 Safety harness
2. Tools	2.1 Adjustable wrench 2.2 Wire stripper 2.3 Hammer 2.4 Combination pliers 2.5 Screwdrivers 2.6 Neon tester 2.7 Avo meter 2.8 Series lamp
3. Materials	3.1 Wire 3.2 Connector 3.3 Cables 3.4 Screw 3.5 Plug
4. Fan	4.1 Ceiling fan 4.2 Exhaust fan 4.3 Wall mounted fan 4.4 Table Fan 4.5 Pedestal Fan
Evidence Guide The evidence must be authentic, valid, sufficient, consistent, recent and meet all requirements of current version of the Unit of Competency.	

1. Critical aspect of competency	Assessment required evidences that the candidate: 1.1 used quality tools and instruments as required standard 1.2 handled multi meter as where required 1.3 checked and tested polarity and continuity 1.4 identified the fault accordingly as standard 1.5 repaired the faults as per identification fault as standard.
2. Underpinning knowledge	2.1 Function and type of tools and instruments. 2.2 State the procedure of using multimeter / AVO meter. 2.3 Definition and types and causes of the faults. 2.4 Definition and types of tests. 2.5 Functions of celling fan, exhaust fan and rice cooker.
3. Underpinning skills	3.1 Handling AVO meter / multimeter. 3.2 Identifying fault. 3.3 Repairing fault. 3.4 Checking and testing polarity and continuity.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implication	The following resources must be available: 5.1 workplace (actual or simulated) 5.2 tools and equipment appropriate to work activities 5.3 availability of materials.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

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towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.

References:

- CS of Bangladesh Technical Education Board (BTEB)
- CS of National Skills Development Authority (NSDA)

Review and Validation of Competency Standard

The Competency Standards for National Skills Certificate Level-2 in **Electrical Installation & Maintenance** is reviewed and validated by NSDA on 23 February, 2025.

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