



COMPETENCY STANDARD FOR Electrical Installation and Maintenance

(Construction Industry Skills Council)

Level: 2

Competency Standard Code: CSCS0004L2V1

এনএসডিএ এর কার্যনির্বাহী কর্মকর্তার
২২/০২/২১ তারিখে অনুষ্ঠিত ৫৫ সভার অনুমোদিত

**National Skills Development Authority
Prime Minister's Office, Bangladesh**

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Introduction

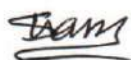
The National Skills Development Authority (NSDA) aims to enhance an individual's employability by certifying completeness with skills. NSDA works to expand the skilling capacity of identified public and private training providers qualitatively and quantitatively. It also aims to establish and operationalize a responsive skill 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 and 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 TVET. Trainees who successfully pass the assessment will receive a qualification in the National Technical and Vocational Qualification Framework (NTVQF) 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.



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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 guides

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.



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Competency Standards for National Skill Certificate – 2 in Electrical Installation and Maintenance

NTVQF with Job Classifications

NTVQF LEVELS	EDUCATION SECTORS			Job Classification
	Pre-Vocation Education	Vocational Education	Technical Education	
NTVQF 6			Diploma in engineering or equivalent	Middle Level Manager /Sub Assistant Engr. etc.
NTVQF 5		National Skill Certificate 5 (NSC 5)		Highly Skilled Worker / Supervisor
NTVQF 4		National Skill Certificate 4 (NSC 4)		Skilled Worker
NTVQF 3		National Skill Certificate 3 (NSC 3)		Semi-Skilled Worker
NTVQF 2		National Skill Certificate 2 (NSC 2)		Basic Skilled Worker
NTVQF 1		National Skill Certificate 1 (NSC 1)		Basic Worker
Pre-Voc 2	National Pre-Vocation Certificate 2 (NPVC 2)			Pre-Vocation Trainee
Pre-Voc 1	National Pre-Vocation Certificate 1 (NPVC 1)			Pre-Vocation Trainee




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NTVQF Level Descriptors

NTVQF Level	Knowledge	Skill	Responsibility	Job Class.
6	<ul style="list-style-type: none"> Comprehensive actual and theoretical knowledge within a specific study area with an awareness of the limits of that knowledge 	<ul style="list-style-type: none"> Specialised and restricted range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems 	<ul style="list-style-type: none"> Manage a team or teams in workplace activities where there is unpredictable change Identify and design learning programs to develop performance of team members 	Supervisor / Middle Level Manager / Sub Assistant Engr. etc.
5	<ul style="list-style-type: none"> Very broad knowledge of the underlying, concepts, principles, and processes in a specific study area 	<ul style="list-style-type: none"> Very broad range of cognitive and practical skills required to generate solutions to specific problems in one or more study areas. 	<ul style="list-style-type: none"> Take overall responsibility for completion of tasks in work or study Apply past experiences in solving similar problems 	Highly Skilled Worker / Supervisor
4	<ul style="list-style-type: none"> Broad knowledge of the underlying, concepts, principles, and processes in a specific study area 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Take responsibility, within reason, for completion of tasks in work or study Apply past experiences in solving similar problems 	Skilled Worker
3	<ul style="list-style-type: none"> Moderately broad knowledge in a specific study area. 	<ul style="list-style-type: none"> 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 	<ul style="list-style-type: none"> Work or study under supervision with some autonomy 	Semi-Skilled Worker
2	<ul style="list-style-type: none"> Basic underpinning knowledge in a specific study area. 	<ul style="list-style-type: none"> Basic skills required to carry out simple tasks 	<ul style="list-style-type: none"> Work or study under indirect supervision in a structured context 	Basic Skilled Worker
1	<ul style="list-style-type: none"> Elementary understanding of the underpinning knowledge in a specific study area. 	<ul style="list-style-type: none"> Limited range of skills required to carry out simple tasks 	<ul style="list-style-type: none"> Work or study under direct supervision in a structured context 	Basic Worker
Pre-Voc 2	<ul style="list-style-type: none"> Limited general knowledge 	<ul style="list-style-type: none"> Very limited range of skills and use of tools required to carry out simple tasks 	<ul style="list-style-type: none"> Work or study under direct supervision in a well-defined, structured context. 	Pre-Vocation Trainee
Pre-Voc 1	<ul style="list-style-type: none"> Extremely limited general knowledge 	<ul style="list-style-type: none"> Minimal range of skills required to carry out simple tasks 	<ul style="list-style-type: none"> Simple work or study exercises, under direct supervision in a clear, well defined structured context 	Pre-Vocation Trainee


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List of Abbreviations

BNBC	- Bangladesh National Building Code
CS	- Competency Standard
ELCB	- Earth Leakage Circuit Breaker
ISC	- Industry Skills Council
FPS	- Foot, Pound, Second
NSDA	- National Skills Development Authority
MKS	- Meter, Kilogram, Second
MCB	- Miniature Circuit Breaker
MCCB	- Molded Case Circuit Breaker
NTVQF	- National Technical and Vocational Qualifications Framework
OSH	- Occupational Safety and Health
PPE	- Personal Protective Equipment
PVC	- Polyvinyl chloride
SCVC	- Standards and Curriculum Validation Committee
STP	- Skills Training Provider
SPST	- Single Pole Single Through
SPDT	- Single Pole Double Trough
SOP	- Standard Operating Procedure
TVET	- Technical Vocational Education and Training
UoC	- Unit of Competency


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Approval of Competency Standard

Members of the Approval Committee:

Member	Signature
Dulal Krishna Saha Executive Chairman (Secretary) National Skills Development Authority	 31.01.21
Md. Nurul Amin Member (Admin & Finance) and Member (Skills Standard & Certification) Joint Secretary National Skills Development Authority	 31.01.21
Alif Rudaba Member (Planning & Research) and Member (Coordination & Evaluation) Joint Secretary National Skills Development Authority	 02/2/2021



31.01.21

Dulal Krishna Saha

Executive Chairman (Secretary)

National Skills Development Authority

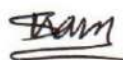
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**National Competency Standards for National Skill Certificate – 2 in
Electrical Installation and Maintenance**

Course Structure

SL	Unit Code and Title		UoC Level	Nominal (Hours)
Generic Competencies				65
1.	GU002L2V1	Apply Occupational Safety and Health (OSH) Procedure in the Workplace	2	15
2.	GU012L2V1	Communicate in the workplace	2	30
3.	GU003L2V1	Work in a team environment	2	20
Sector Specific Competencies				40
4.	SUCS001L2V1	Work in the Construction Sector	2	20
5.	SUCS002L2V1	Interpret Drawings and Specifications in Construction Manuals	2	20
Occupation Specific Competencies				255
6.	OUEIM001L2V1	Use Hand Tools and Power Tools	2	20
7.	OUEIM002L2V1	Apply Fundamentals Skills for Electrical Works	2	20
8.	OUEIM003L2V1	Perform Wire and Cable Joints	2	20
9.	OUEIM004L2V1	Perform Installation of Electrical Circuit	2	50
10.	OUEIM005L2V1	Perform Channel Wiring	2	70
11.	OUEIM006L2V1	Perform Conduit Wiring	2	75
Total Nominal Learning Hours				360



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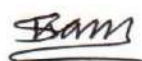
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Units & Elements at a Glance:

Generic Competencies (65 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GU002L2V1	Apply Occupational Safety and Health (OSH) Procedure in the Workplace	<ol style="list-style-type: none"> 1. Identify OSH policies and procedure 2. Follow OSH procedure 3. Report hazards and risks 4. Respond to emergencies 5. Maintain personal well-being 	15
GU012L2V1	Communicate in the workplace	<ol style="list-style-type: none"> 1. Receive verbal instructions. 2. Interpret verbal and written information/ instruction 3. Convey instructions using verbal and written forms of communication 4. Complete written documentation 5. Participate in work place meetings and discussions. 	30
GU003L2V1	Work in a team environment	<ol style="list-style-type: none"> 1. Define team role and scope. 2. Identify individual role and responsibility. 3. Participate in team discussions. 4. Work as a team member. 	20
Total Hour			65



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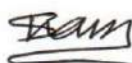
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Sector Specific Competencies (40 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
SUCS001L2V1	Work in the Construction Sector	<ol style="list-style-type: none"> 1. Describe the organizational structure within the sector. 2. Identify processes and procedures. 3. Identify tools, equipment and materials. 4. Identify workplace requirements. 5. Organize own workload. 6. Practice OHS. 	20
SUCS002L2V1	Interpret Drawings and Specifications in Construction Manuals	<ol style="list-style-type: none"> 1. Identify information from manuals. 2. Interpret drawings and specifications. 3. Store manuals. 	20
Total Hours			40



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Occupation Specific Competencies (255 Hours)

Code	Unit of Competency	Elements of Competency	Hours
OUEIM001L2V1	Use hand tools and power tools	<ol style="list-style-type: none"> 1. Practice OHS 2. Identify tools 3. Use hand tools 4. Use power tools 5. Perform basic preventive maintenance 6. Clean and store tools 	20
OUEIM002L2V1	Apply Fundamental Skills for Electrical Works	<ol style="list-style-type: none"> 1. Prepare for works 2. Identify types of tool/equipment 3. Identify symbols of electrical fittings 4. Identify fittings used in electrical works 5. Measure Current 6. Measure Voltage 7. Maintain workplace, tools, equipment and materials 	20
OUEIM003L2V1	Perform Wire and Cable Joints	<ol style="list-style-type: none"> 1. Prepare for works 2. Identify sizes and capacity of wires and cables 3. Make Wire and Cable Joint 4. Maintain workplace, tools, equipment and materials 	20
OUEIM004L2V1	Perform Installation of Electrical Circuit	<ol style="list-style-type: none"> 1. Prepare for works 2. Control one lamp by SPST and SPDT switch 3. Control one calling bell from two point 4. Prepare the circuit of Fluorescent Lamp (Tube Light) 5. Install Ceiling Fan with regulator 	50
OUEIM005L2V1	Perform Channel Wiring	<ol style="list-style-type: none"> 1. Prepare for works 2. Perform Channel Wiring 3. Install boards and other accessories of wiring 4. Test the wiring 5. Maintain workplace, tools and materials 	70
OUEIM006L2V1	Perform Conduit Wiring	<ol style="list-style-type: none"> 1. Collect tools, equipment and materials 2. Install conduits and set cables 3. Install boards and other accessories of wiring 4. Test the wiring 5. Maintain workplace, tools and materials 	75
Total Hours			255

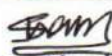

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Generic Competencies



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Unit Code and Title	GCU02L2V1: Apply Occupational Safety and Health (OSH) Procedure in the Workplace
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSA) required in applying occupational safety and health (OSH) procedures in the workplace. It specifically includes – identifying OHS policies and procedures, following OSH procedure, reporting to emergencies, and maintaining personal well-being.
Nominal Hours	15 Hours
Elements of Competency	Performance Criteria <u>Bold & Underlined</u> terms are elaborated in the Range of Variables
1. Identify OSH policies and procedures.	1.1. <u>OHS policies</u> and <u>safe operating procedures</u> are accessed and stated. 1.2. <u>Safety signs and symbols</u> are identified and followed. 1.3. Emergency response, evacuation procedures and other contingency measures are determined according to workplace requirements.
2. Follow OSH procedure	2.1 <u>Personal protective equipment (PPE)</u> is selected and collected as required. 2.2 Personal protective equipment (PPE) is correctly used in accordance with organization OHS procedures and practices. 2.3 A clear and tidy workplace is maintained as per workplace standard. 2.4 PPE is maintained to keep them operational and compliant with OHS regulations.
3. Report hazards and risks.	3.1 <u>Hazards</u> and risks are identified, assessed and controlled. 3.2 Incidents arising from hazards and risks are reported to designated authority.
4. Respond to emergencies	4.1 Alarms and warning devices are responded. 4.2 Workplace <u>emergency procedures</u> are followed. 4.3 <u>Contingency measures</u> during workplace accidents, fire and other emergencies are recognized and followed in accordance with organization procedures. 4.4 First aid procedures is applied during emergency situations.
5. Maintain personal well-being	5.1 OHS policies and procedures are adhered to. 5.2 OHS awareness programs are participated in as per workplace guidelines and procedures. 5.3 Corrective actions are implemented to correct unsafe condition in the workplace. 5.4 <u>"Fit to work" records</u> are updated and maintained according to workplace requirements.
Range of Variables	
Variables	Range (may include but not limited to):
1. OHS Policies	1.1. Bangladesh standards for OHS 1.2. Fire Safety Rules and Regulations 1.3. Code of Practice 1.4. Industry Guidelines


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2. Safe Operating Procedures	2.1 Orientation on emergency exits, fire extinguishers, fire escape, etc. 2.2 Emergency procedures 2.3 First Aid procedures 2.4 Tagging procedures 2.5 Use of PPE 2.6 Safety procedures for hazardous substances
3. Safety Signs and symbols	3.1 Direction signs (exit, emergency exit, etc.) 3.2 First aid signs 3.3 Danger Tags 3.4 Hazard signs 3.5 Safety tags 3.6 Warning signs
4. Personal Protective Equipment (PPE)	4.1 Gas Mask 4.2 Gloves 4.3 Safety boots 4.4 Face mask 4.5 Overalls 4.6 Goggles and safety glasses 4.7 Sun block 4.8 Chemical/Gas detectors
5. Hazards	5.1 Chemical hazards 5.2 Biological hazards 5.3 Physical Hazards 5.4 Mechanical and Electrical Hazard 5.5 Mental hazard 5.6 Ergonomic hazard
6. Emergency Procedures	6.1 Fire fighting 6.2 Earthquake 6.3 Medical and first aid 6.4 evacuation
7. Contingency measures	7.1 Evacuation 7.2 Isolation 7.3 Decontamination
8. "Fit to Work" records	8.1 Medical Certificate every year 8.2 Accident reports, if any 8.3 Eye vision certificate

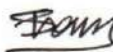
Evidence Guide

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: <ul style="list-style-type: none"> 1.1 stated OHS policies and safe operating procedures 1.2 followed safety signs and symbols 1.3 used personal protective equipment (PPE) 1.4 maintained workplace clear and tidy 1.5 assessed and Controlled hazards 1.6 followed emergency procedures 1.7 followed contingency measures 1.8 implemented corrective actions
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2. Underpinning knowledge	2.1 Define OHS 2.2 OHS Workplace Policies and Procedures 2.3 Work Safety Procedures 2.4 Emergency Procedures 2.5 Hazard control procedure 2.6 Different types of Hazards 2.7 PPE and there uses 2.8 Personal Hygiene Practices 2.9 OHS Awareness
3. Underpinning skills	3.1 Accessing OHS policies 3.2 Handling of PPE 3.3 Handling cleaning tools and equipment 3.4 Writing report 3.5 Responding to emergency procedures
4. Required attitude	4.1 Commitment to occupational health and safety 4.2 Sincere and honest to duties 4.3 Promptness in carrying out activities 4.4 Environmental concerns 4.5 Eagerness to learn 4.6 Tidiness and timeliness 4.7 Respect of peers and seniors in workplace 4.8 Communicate with peers and seniors in workplace
5. Resource implications	5.1 Adequate workplace 5.2 Equipment and outfits appropriate in applying safety measures 5.3 Tools, materials and documentation required 5.4 OHS Policies and Procedures
6. Methods of assessment	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 any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	



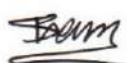
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Unit code and Title	GU012L2V1: Communicate in the Workplace
Nominal Hours	30 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes (KSAs) required to communicate in the workplace.</p> <p>It includes the use of verbal and written forms of communication to receive, interpret, convey, and document information/ instruction using appropriate communication equipment.</p>
Elements of Competency	<p>Performance Criteria</p> <p><u>Bold & Underlined</u> terms are elaborated in the Range of Variables Training Components</p>
1. Receive verbal instructions.	<p>1.1 Instructions are accessed and interpreted</p> <p>1.2 Questions are asked to clarify understanding or gain more information.</p> <p>1.3 Information/instruction is recorded.</p>
2. Interpret verbal and written information/ instruction	<p>2.1 <u>Written instructions</u> are interpreted.</p> <p>2.2 Work <u>signage's</u> are properly responded.</p> <p>2.3 Routine written instructions are followed in sequence.</p> <p>2.4 Feedback is given to workplace supervisor.</p>
3. Convey instructions using verbal and written forms of communication	<p>3.1 Relevant <u>communication</u> methods are used to transmit instructions.</p> <p>3.2 Appropriate non-verbal communication is used.</p> <p>3.3 Channels of communication are identified and followed</p> <p>3.4 Communication <u>tools and equipment</u> are operated and faults are identified and reported.</p> <p>3.5 Information is conveyed using appropriate <u>forms</u>.</p>
4 Complete written documentation	<p>4.1 All required <u>documentation</u> is completed</p> <p>4.2 Workplace data are recorded</p> <p>4.3 Written information/instruction is passed to personnel.</p>
5. Participate in work place meetings and discussions	<p>5.1 Meetings are attended regularly and on time.</p> <p>5.2 Meeting inputs are consistent with the meeting purpose and established protocols.</p> <p>5.3 Opinions are expressed without interruption.</p> <p>5.4 Meeting outputs are processed and implemented.</p>
Range of Variables	
Variable	Range (may include but not limited to):
1. Written instructions	<p>1.1 Supervisor's/Manager's Instructions</p> <p>1.2 Memoranda</p> <p>1.3 Rules and Regulations</p> <p>1.4 Signage</p> <p>1.5 Approved Work Plan</p> <p>1.6 External communications</p>
2. Workplace guidelines	<p>2.1 Labor Policies and Guidelines</p> <p>2.2 Written Instructions</p> <p>2.3 Operations Manual</p> <p>2.4 Organizational Manuals</p>

	2.5 Quality Assurance Handbook
3. Signage	3.1 On-site direction signs 3.2 Common site warnings 3.3 Location signs 3.4 Traffic signs
4. Communication	4.1 Verbal instructions 4.2 Written instructions 4.3 Online communication
5. Tools and machinery	5.1 Telephone 5.2 Mobile Phone 5.3 Fax machines 5.4 Two-way radio 5.5 Computers 5.6 Forms 5.7 Memo 5.8 Two-way radio
6. Forms	6.1 Memorandum 6.2 Requisitioning Form 6.3 Personnel Form 6.4 Safety Report Form
7. Documentation	7.1 Reports (Monthly, Quarterly, Half-Yearly, Annual) 7.2 Plans (Strategic Plan, Operational Plan, Monthly Schedule) 7.3 Monitoring and Evaluation Report 7.4 Minutes of Meetings
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 demonstrated knowledge of workplace procedures in receiving, interpreting and conveying verbal & written communication. 1.2 satisfied the requirements mentioned in the Performance Criteria and Range of Variables.
2. Underpinning Knowledge	2.1 Workplace Communication Policies, Standards and Procedures 2.2 Verbal and Non-verbal communication 2.3 Modes of Communication 2.4 Communication Equipment: Types, Uses and Faults 2.5 Channels of Communication




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3. Underpinning Skills	3.1 Receiving verbal instructions. 3.2 Interpreting verbal and written information/ instruction 3.3 Conveying instructions using verbal and written forms of communication 3.4 Completing written documentation 3.5 Participating in workplace meetings and discussions
4. Underpinning Attitude	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	The following resources must be provided: 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 NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

Accreditation Requirements

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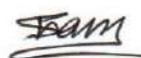
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Unit Code and Title	GU003L2V1: Work in a Team Environment
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes (KSAs) required in working in a team environment.</p> <p>It includes the following: identify OHS policies and procedures, follow personal safety measures, report hazards and risks, respond to emergencies, and maintain personal well-being.</p>
Nominal Hours	20 Hours
Elements of Competency	<p>Performance Criteria</p> <p><u>Bold & Underlined</u> terms are elaborated in the Range of Variables</p>
1. Define team role and scope	<p>1.1. Role and objectives of the team are defined.</p> <p>1.2. Team structure, responsibilities and reporting relations are identified from team discussions and other external sources.</p>
2. Identify individual role and responsibility	<p>2.1 Individual roles and responsibilities of <u>team members</u> are identified.</p> <p>2.2 Reporting relationships among team members are defined and clarified.</p> <p>2.3 Reporting relationships external to the team are defined and clarified.</p>
3. Participate in team discussions	<p>3.1 Ideas related to team plans are contributed.</p> <p>3.2 Recommendations for improving team work are put forward.</p>
4. Work as a team member	<p>4.1. Effective forms of communication are used to interact with team members.</p> <p>4.2. Communication channels are followed.</p> <p>4.3. OHS practices are followed.</p>
Range of Variables	
Variables	Range (may include but not limited to):
1. Sources of information	<p>1.1 Standard Operating Procedures</p> <p>1.2 Job Description</p> <p>1.3 Operations Manual</p> <p>1.4 Organizational Structure</p>
2. Team Members	<p>2.1 Coach/mentor</p> <p>2.2 Supervisor/Manager</p> <p>2.3 Peers/Colleagues</p> <p>2.4 Employee representative</p>
3. Workplace context	<p>3.1 National Laws and Statutes</p> <p>3.2 Standard Operating Procedures</p> <p>3.3 Workplace Rules and Regulations</p>
<p>Evidence Guide</p> <p>The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency</p>	



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1. Critical aspects of competency	<p>Assessment required evidence that the candidate:</p> <p>1.1 demonstrated knowledge in working in a team environment.</p> <p>1.2 satisfied the requirements mentioned in the performance Criteria and Range of Variables</p> <p>1.3</p>
2. Underpinning knowledge	<p>2.1 Team Structure, Role and Responsibility</p> <p>2.2 Individual Members' Roles and Responsibilities</p> <p>2.3 Communication Flow and Reporting Structures</p> <p>2.4 Team Planning</p> <p>2.5 Interpersonal Communication Skills</p> <p>2.6 Team Meeting Procedures</p> <p>2.7 OHS Practices</p>
3. Underpinning skills	<p>3.1 Identifying the role and responsibility of the team</p> <p>3.2 Identifying roles and responsibilities of individual members</p> <p>3.3 Participating in team discussions</p> <p>3.4 Working as a team member</p>
4. Underpinning Attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Environmental concerns</p> <p>4.3 Eagerness to learn</p> <p>4.4 Tidiness and timeliness</p> <p>4.5 Respect for rights of peers and seniors in workplace</p> <p>4.6 Communication with peers and seniors in Workplace</p>
5. Resource implications	<p>The following resources must be provided:</p> <p>5.1 Pens</p> <p>5.2 Telephone</p> <p>5.3 Computer</p> <p>5.4 Writing materials</p> <p>5.5 Online communication</p>
6. Methods of assessment	<p>Methods of assessment may include but not limited to:</p> <p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral questioning</p> <p>6.4 Written test</p> <p>6.5 Portfolio</p>
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>
<p>Accreditation Requirements</p> <p>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 any NTVQF qualification. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.</p>	



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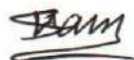
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Sector Specific Competencies



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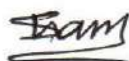
Unit Code and Title	SUCS001L2V1: Work in the Construction Sector
Nominal Hours	20 Hours
Unit Descriptor	This unit covers the skills, knowledge and attitude in working in the construction sector. It includes describe the organizational structure within the construction sector, identify processes and procedures, identify tools, equipment and materials, identify workplace practices, and organize own workload, and practice OHS.
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Describe the organizational structure within the sector	1.1 Scope, nature and <u>major fields</u> of the construction sector are determined 1.2 The profile of the construction sector in relation to Bangladesh <u>employment conditions</u> is determined 1.3 Trends and technologies relevant to the sector are explained. 1.4 Relevant policies and guidelines are identified and interpreted. 1.5 <u>Instructions</u> as to procedures in achieving quality are obtained, understood and clarified.
2. Identify processes and procedures	2.1 Construction processes are identified and described. 2.2 Work activities are identified. 2.3 Adjustments are interpreted.
3. Identify tools, equipment and materials	3.1 Appropriate manuals are accessed to ensure up-to-date specifications of tools, materials and equipment. 3.2 Construction <u>tools, materials and equipment</u> are identified. 3.3 Substitutes are identified in case of non-availability.
4. Identify workplace requirements	4.1 <u>Workplace requirements</u> are identified and clarified. 4.2 Roles and responsibilities of all personnel are described. 4.3 Workplace's practices are identified. 4.4 <u>Problem-solving strategies</u> are used to address bottlenecks, inconsistencies and other concerns.
5. Organize own workload	5.1 Own work activities are planned and progress of work is communicated to relevant staff. 5.2 Work activities are completed. 5.3 Difficulties and bottlenecks are identified, and solutions are put forwarded. 5.4 Own work is monitored against workplace standards and areas for improvement identified and acted upon.
6. Practice OHS	6.1. Relevant OHS practices are identified. 6.2. Relevant OHS practices are interpreted and implemented.
Range of Variables	
Variables	Range (may include but not limited to):
1. Major Fields	1.1 Construction Site Support (Dogging, Rigging, etc.) 1.2 Carpentry and Form Works 1.3 Masonry, Brick/Block Laying and Concreting 1.4 Surface Finishing, Tiling and Painting 1.5 Roofing 1.6 Plumbing

	1.7 Residential Electrical Wiring and Cabling
2. Employment conditions	2.1 Code of Practice 2.2 Salary/Wage System 2.3 Labor Practices 2.4 Anti-Discrimination Policy 2.5 Gender Issues 2.6 Collective Bargaining and Other Practices 2.7 Awards 2.8 Procedures for Handling Disputes 2.9 Innovations in the Sector
3. Instructions	3.1 Specifications and requirements 3.2 Standard operating procedures 3.3 Manuals of Instruction 3.4 Operations Manual 3.5 Environmental Guidelines 3.6 Gender and Develop Guidelines
4. Manuals	4.1 Manual of Instructions 4.2 Manual of Specifications 4.3 Repair Manual 4.4 Quality Manual 4.5 Maintenance Procedure and Troubleshooting
5. Workplace requirements	5.1 Goals and objectives 5.2 Strategic and Operational Plans 5.3 Systems and Processes 5.4 Monitoring and Evaluation 5.5 Reports and Documentation
6. Tools, equipment and materials	Refers to all tools, equipment and materials appropriate for any of the construction fields
7. Problem-solving strategies	7.1 Asking questions 7.2 Feedback and Feed forward system 7.3 Reference to Standard Operating Procedures 7.4 Accessing Information 7.5 Reviews 7.6 Brainstorming
8. OHS	8.1 Reporting hazards, risks and emergencies 8.2 Arrangement of workplaces 8.3 Standard Operating Procedure 8.4 Workplace environment and safety 8.5 Safe storage of tools and equipment 8.6 Use of PPE
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 demonstrated knowledge in working in the construction sector 1.2 satisfying all the requirements mentioned in the performance Criteria and Range of Variables
2. Underpinning knowledge	2.1 Scope and Major Divisions of the Construction Sector 2.2 Relevant Policies and Guidelines in the Construction Sector 2.3 Manuals used in the Construction Sector 2.4 Relevant Terminologies and Acronyms

	2.5 Types and Uses of Construction Tools and Materials. 2.6 Workplace Practices 2.7 Occupational Health and Safety Practices 2.8 Recording and Reporting practices
3. Underpinning skills	3.1 Describing the organization structure 3.2 Identifying construction processes and procedures 3.3 Identifying tools, equipment and materials 3.4 Identifying workplace practices 3.5 Organizing own workload 3.6 Practicing OHS
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
5. Resource implications	5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials 5.5 Online communication
6. Methods of assessment	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 NSDA accredited assessment centre 7.2 Assessment should be done by a NSDA certified/nominated assessor

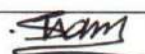
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Unit Code and Title	SUCS002L2V1: Interpret Drawings and Specifications in Construction Manuals
Nominal Hours	20 Hours
Unit Descriptor	<p>This unit covers the knowledge, skill and attitude required in interpreting drawings and specifications in construction manuals.</p> <p>It includes the following steps: identify information, identify drawings and specifications, interpret drawings and specifications, and apply occupational health and safety procedures.</p>
Elements of Competency	<p>Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.</p>
1. Identify information from manuals	<p>1.1 Appropriate manuals are identified and accessed.</p> <p>1.2 Version and date of the manual are checked to ensure up-to-date specifications of tools, equipment, materials and procedures.</p>
2. Identify drawings and specifications	<p>2.1 Relevant <u>drawings</u> and <u>specifications</u> are correctly identified.</p> <p>2.2 <u>Terms and abbreviations</u> are identified.</p> <p>2.3 <u>Signs and symbols</u> are identified</p>
3. Interpret drawings and specifications	<p>3.1 Drawings and specifications are interpreted.</p> <p>3.2 Schedules, dimensions and specifications contained in the drawings are interpreted.</p>
4. Store manuals	<p>4.1. Documents are collected and packed.</p> <p>4.2. Documents are stored to prevent damage, and ready access and updating of information when required.</p>
Range of Variables	
Variables	Range (may include but not limited to):
1. Documents	<p>1.1 Manufacturer's Specification Manual</p> <p>1.2 Repair Manual</p> <p>1.3 Maintenance Procedure Manual</p> <p>1.4 Periodic Maintenance Manual</p> <p>1.5 Quality Manual</p> <p>1.6 Manual of Instruction</p>
2. Drawings	<p>2.1 Technical Drawings</p> <p>2.2 Sketch</p>
3. Specifications	<p>3.1 Product specifications</p> <p>3.2 Performance specifications</p> <p>3.3 Method specifications</p>
4. Instructions	<p>4.1 Orders</p> <p>4.2 Special Orders</p>
5. Terms and abbreviations	Refers to all terms and abbreviations associated with the construction sector
6. 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	<p>Assessment required evidence that the candidate:</p> <p>1.1 interpret drawings and specifications in construction documents</p> <p>1.2 satisfying the requirements mentioned in the Performance Criteria and Range of Variables</p>
2. Underpinning knowledge	<p>2.1 Types of Construction Manuals</p> <p>2.2 Identification of Signs and Symbols</p> <p>2.3 Identification of Units of Measurement</p> <p>2.4 Identification of Units of Conversion</p> <p>2.5 Drawings and Specifications</p> <p>2.6 Terms and Abbreviations Used</p>
3. Underpinning skills	<p>3.1 Identifying appropriate manuals</p> <p>3.2 Identifying drawings and specifications</p> <p>3.3 Interpreting drawings and specifications</p> <p>3.4 Storing manuals</p>
4. Underpinning attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Environmental concerns</p> <p>4.3 Eagerness to learn</p> <p>4.4 Tidiness and timeliness</p> <p>4.5 Respect for rights of peers and seniors in workplace</p>
5. Resource implications	<p>5.1 Pens</p> <p>5.2 Telephone</p> <p>5.3 Computer</p> <p>5.4 Writing materials</p> <p>5.5 Online communication</p>
6. Methods of assessment	<p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral questioning</p> <p>6.4 Written test</p> <p>6.5 Portfolio</p>
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>

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Occupation Specific Competencies


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Unit Code and Title	OUEIM001L2V1: Use Hand Tools and Power Tools
Nominal Hours	20 Hours
Unit Descriptor	<p>This unit covers the skills, knowledge and attitude in using hand tools and power tools.</p> <p>It includes practicing OSH, identifying tools, using hand tools, power tools, performing basic preventive maintenance and cleaning and storing tools.</p>
Elements of Competency	<p>Performance Criteria</p> <p><u>Bold and Underlined</u> terms are elaborated in the Range of Variables.</p>
1. Practice OSH	<p>1.1 <u>PPE</u> are used</p> <p>1.2 Devices to suppress dust are used as required</p> <p>1.3 Safety requirements are being adhered to before, during and after use</p> <p>1.4 Accidents and emergency cases are reported</p> <p>1.5 The workplace is cleaned and cleared of debris and unwanted materials</p>
2. Identify tools	<p>2.1 Appropriate <u>tools</u> are selected</p> <p>2.2 <u>Applications</u> of tools are defined</p> <p>2.3 <u>Hand tools</u> and <u>power</u> tools are prepared</p> <p>2.4 Sources of power supply for power tools recognized</p>
3. Use hand tools	<p>3.1 Appropriate tool is used as required</p> <p>3.2 Proper hand-eye coordination is applied in the use of hand tools</p> <p>3.3 Unsafe or faulty tools are identified and marked for repair</p>
4. Use power tools	<p>4.1 Route for power supply established in accordance with worker safety requirements</p> <p>4.2 Proper sequence of operations is applied in using power tools to produce results</p> <p>4.3 Power tools are used as required</p>
5. Perform basic preventive maintenance.	<p>5.1 Tools and equipment are cleaned</p> <p>5.2 Appropriate lubricants are identified</p> <p>5.3 Tools and equipment are lubricated</p> <p>5.4 Measuring instruments are checked and calibrated</p> <p>5.5 Defective instruments, equipment and accessories are inspected and corrected or replaced</p> <p>5.6 Tools are inspected, repaired and replaced after use</p>
6. Clean and store tools	<p>6.1. The workplace is cleaned and cleared of debris and unwanted materials</p> <p>6.2. Waste materials are disposed</p> <p>6.3. Inventory of tools are conducted</p> <p>6.4. Tools are cleaned and stored safely in appropriate location</p> <p>6.5. Hazardous materials are identified for separate handling.</p>

Range of Variables	
Variables	Range (may include but not limited to):
1. Tools	1.1 Hand Tools 1.2 Power Tools
2. Applications	2.1 Adjusting 2.2 Aligning 2.3 Assembling 2.4 Clamping 2.5 Cleaning 2.6 Cutting 2.7 Dismantling 2.8 Finishing 2.9 Hand sharpening 2.10 Lubricating 2.11 Scraping 2.12 Simple Tool Repairs 2.13 Threading 2.14 Tightening
3. Hand tools	3.1 Adjustable spanners 3.2 Bench vise 3.3 C-clamp 3.4 Chisels 3.5 Die and stock 3.6 Files of all cross-sectional shapes and types 3.7 Wire Gauges 3.8 Hacksaw 3.9 Hammers 3.10 Hand drill machine 3.11 Hand saws 3.12 Measuring Tape 3.13 Paint Brushes/Rollers 3.14 Pliers 3.15 Plumb bob 3.16 Punches 3.17 Scarpers 3.18 Screw drivers 3.19 Sledge Hammers 3.20 Spanners and Wrenches 3.21 Electrician Knife 3.22 String Lines 3.23 Trowels and Floats 3.24 Try square 3.25 Vice grip 3.26 Wire stripper 3.27 Crimping tools 3.28 Wooden Planer

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4. Power Tools	4.1 Hand Drill Machine 4.2 Nail guns 4.3 Staplers 4.4 Angle Grinders 4.5 Circular saw 4.6 Pedestal drills 4.7 Pedestal grinders 4.8 Soldering Iron 4.9 Power Screw drivers
5. Instructions	5.1. Manufacturer's Specifications and Instructions for specific tools/equipment 5.2. Workplace orders and instructions 5.3. Work schedule documentation 5.4. Procedures
6. PPE	6.1. Dust mask 6.2. Safety glasses/Goggles 6.3. Hand Gloves 6.4. Safety shoes/boots 6.5. Apron 6.6. Safety Helmet 6.7. Safety Belt 6.8. Ear Plug
7. Forms	7.1 Maintenance schedule forms 7.2 Requisition slip 7.3 Inventory Form 7.4 Inspection Forms 7.5 Procedures
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 followed OSH as per job requirement 1.2 identified appropriate tools 1.3 used hand tools with appropriate method 1.4 used power tools with appropriate SOP 1.5 performed preventive maintenance
2. Underpinning knowledge	2.1 Define tools 2.2 Classify tools 2.3 Define equipment 2.4 Standard procedure of the use of hand tools and power tools 2.5 Application of hand tools and power tools 2.6 Basic preventive maintenance of tools
3. Underpinning skills	3.1 Identifying appropriate tools 3.2 Handling tools and equipment with appropriate method 3.3 Identifying power sources

	3.4 Using power tools with appropriate SOP 3.5 Identifying preventive maintenance
4. Underpinning attitudes	4.1 Commitment to occupational safety and health 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
5. Resource implications	The following resources must be provided 5.1 Standard workplaces 5.2 Tools required as per job requirements 5.3 Operating Manuals, Codes, Standards and reference materials 5.4 Materials to perform work activities
6. Methods of assessment	Competency should be assessed by 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

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Unit Code and Title	OUEIM002L2V1: Apply Fundamentals Skills for Electrical Works
Nominal Hours	20 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to apply fundamental skills for electrical works.</p> <p>It also includes preparing for works, identifying types of tools/equipment, symbols of electrical fittings, fittings used in electrical works. Measuring current, voltage and Maintain workplace, tools, equipment and materials.</p>
Elements of Competency	Performance Criteria <u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Prepare for works	1.1. <u>PPE</u> is collected and worn as per job requirement 1.2. Workplace is prepared as per job requirement 1.3. <u>Tools, equipment and materials</u> are selected and collected as per job requirement
2. Identify types of tools/equipment	2.1 Collected Tools/equipment are displayed 2.2 Tools are listed and tagged as per tool specification
3. Identify symbols of electrical fittings	3.1 Electrical <u>symbols</u> are listed 3.2 Symbols are matched with listed symbol as per drawing 3.3 Symbols are tagged by match with the fittings
4. Identify fittings used in electrical works	4.1 <u>Fittings</u> are collected and displayed 4.2 Fittings are listed and tagged 4.3 Fittings are matched with listed fitting as per drawing
5. Measure Current	Using ampere meter 5.1 Insulation of cable terminal is removed using knife or wire stripper as required 5.2 Range of Ammeter is set as per job requirement 5.3 The ampere meter is connected in series with the load as per circuit diagram 5.4 Power supply switch is kept on as maintaining SOP 5.5 Ampere meter reading is recorded Using clip-on meter 5.6 Selector knob is adjusted of clip-on meter as required 5.7 Phase cable is inserted into the ring of the clip-on meter 5.8 Ampere meter reading is recorded 5.9 Clip-on meter is disconnected from the phase line as required
6. Measure Voltage	Using Volt meter 6.1 Insulation of cable terminal is removed using knife or wire stripper as required 6.2 Range of voltmeter is set as per job requirement 6.3 Voltmeter is connected in parallel with the load as per circuit diagram 6.4 Power supply is switched ON as required 6.5 Volt meter reading is recorded Using AVO/Multi meter 6.6 AVO/Multi meter pointer/scale is adjusted 6.7 Selector switch of AVO/Multi meter is kept in AC voltage range as required

	6.8 AVO/Multi meter is connected to probe/test cord with supply line (phase to phase or phase to neutral) as per circuit diagram 6.9 AVO/Multi meter reading is recorded 6.10 Power supply is disconnected as required
7. Maintain workplace, tools, equipment and materials	7.1 Tools, equipment and materials are cleaned as per SOP 7.2 Defective tools and equipment are identified, separated and reported to the designated person 7.3 Tools, equipment and materials are stored as per workplace procedure 7.4 Workplace is cleaned as per SOP 7.5 Waste materials are disposed in the designated place
Range of Variables	
Variables	Range (may include but not limited to):
1. PPE	1.1. Helmet 1.2. Safety Goggles 1.3. Mask 1.4. Apron 1.5. Rubber Gloves 1.6. Safety Shoes
2. Tools and Accessories	Hand tools: 2.1 Hammer 2.2 Cutting Pliers 2.3 Nose Pliers 2.4 Combination Pliers 2.5 Adjustable Wrench 2.6 Wire Striper 2.7 Neon Tester 2.8 Screw Driver (Flat, star and connecting) 2.9 Grip Pliers 2.10 Electrician Knife 2.11 Chisel (Cold and hot) 2.12 Open end spanner 2.13 Poker 2.14 Twisters 2.15 Scriber 2.16 File (Round, half round, flat, triangle) 2.17 Ammeter 2.18 Volt meter 2.19 Multi Meter 2.20 Measuring tape Power tools: 2.28 Drill Machine (Manual and Electrical) 2.29 Grinding Machine Accessories: 2.30 Ladder
3. Symbols	3.1 All electrical fittings and fixtures
4. Fittings	4.1 Switch 4.2 Switch Board 4.3 Regulator

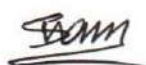
	4.4 Socket 4.5 Holder 4.6 Ceiling Rose 4.7 Junction Box 4.8 Channel 4.9 PVC Conduit 4.10 PVC Elbow 4.11 PVC Bend 4.12 PVC Socket 4.13 Circular Box 4.14 Saddle 4.15 Indicator
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidences that the candidate: 1.1 followed Occupational Safety and Health Procedure in the workplace 1.2 identified and collected tools, equipment, symbols and fittings 1.3 used tools, equipment and Fittings as per standard 1.4 connected ampere meter with load and measured current 1.5 inserted phase cable into the ring of the clip-on meter and measure current 1.6 connected volt meter with the load and measured voltage 1.7 connected AVO meter to supply line and measured voltage 1.8 cleaned tools, equipment and materials 1.9 disposed waste materials in designated place
2. Underpinning knowledge	2.1 Specification of tools, equipment and fittings. 2.2 Identification and use of symbols. 2.3 Series circuit 2.4 Parallel circuit 2.5 Measurement of current 2.6 Measurement voltage 2.7 Definition of Preventive Maintenance, Methods and Techniques, Quality Procedures 2.8 Storing Procedures 2.9 Function and properties of fittings 2.10 Functions and safety precaution of tools
3. Underpinning Skills	3.1 Using PPE 3.2 Using Tools, Equipment and Materials 3.3 Selecting appropriate Tools, Equipment and fittings 3.4 Checking specifications 3.5 Locating and marking points 3.6 Handling of measuring instruments
4. Underpinning attitudes	4.1 Commitment to occupational safety and health 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


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5. Resource implications	<p>The following resources must be provided:</p> <p>5.1 Workplace location.</p> <p>5.2 Tools and equipment are available.</p> <p>5.3 Materials relevant to work activity.</p> <p>5.4 Drawing and specifications relevant to the task.</p>
6. Methods of assessment	<p>Competency should be assessed by:</p> <p>6.1 Demonstration</p> <p>6.2 Oral questioning</p> <p>6.3 Written test</p> <p>6.4 Portfolio</p>
7. Context of assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>

Accreditation Requirements

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Unit Code and Title	OUEIM003L2V1: Perform Wire and Cable Joints
Nominal Hours	20 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitude required to perform wire and cable joints.</p> <p>It also includes preparing works, identifying different sizes and capacity of wires and cables, making wire and cable joint and Maintain Workplace, Tools, Equipment and Materials.</p>
Elements of Competency	Performance Criteria
	<u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Prepare for works	<p>1.1. <u>PPE</u> is collected and worn as per job requirement</p> <p>1.2. Workplace is prepared as per job requirement</p> <p>1.3. <u>Tools, equipment and materials</u> are selected and collected as per job requirement</p>
2. Identify sizes and capacity of wires and cables	<p>2.1. <u>Wire and cable</u> are placed separately in the working table in sequence</p> <p>2.2. Wires and cables are listed & tagged as per sizes</p> <p>2.3. Size of the cable is compared with the cable specification as per requirement</p> <p>2.4. Proper diameter of conductor is measured using SWG/Micrometer</p> <p>2.5. <u>Cable sizes</u> are compared with current carrying capacity</p>
3. Make Wire and Cable Joint	<p>3.1. Insulation of cable is removed as required from cable terminal using knife or wire stripper</p> <p>3.2. Conductor surface is scraped by using emery paper/electrician knife</p> <p>3.3. Scraped cables are tying according to the requirement of <u>wire and cable joint</u></p> <p>3.4. Soldering (if required)</p> <p>3.5. Tying wire is tapped as per drawing</p>
4. Maintain Workplace, Tools, Equipment and Materials	<p>4.1. Tools, equipment and materials are cleaned as per manufacturer instruction</p> <p>4.2. Defective tools and equipment are identified and separated and reported to the designated person</p> <p>4.3. Tools, equipment and materials are restored as per workplace procedure</p> <p>4.4. Workplace is cleaned as per company procedure</p> <p>4.5. Waste materials are disposed in the designated place</p>
Range of Variables	
Variable	Range (may include but not limited to):
1. Personal Protective equipment (PPE)	<p>1.1 Helmet</p> <p>1.2 Safety Goggles</p> <p>1.3 Mask</p> <p>1.4 Apron</p>



	1.5 Hand Gloves 1.6 Safety Shoe
2. Tools	2.1 Hammer 2.2 Cutting Pliers 2.3 Combination Pliers 2.4 Wire Striper 2.5 Neon Tester 2.6 Screw Driver (Flat, Philip's and connecting) 2.7 Electrician Knife 2.8 Soldering Iron 2.9 Nose Pliers
3. Wire and cables	3.1 PVC Cable 3.2 BYA 3.3 BYM 3.4 NYY
4. Sizes of cables	4.1 1.0 re 4.2 1.5 rm 4.3 2.5 rm 4.4 3.0 rm 4.5 4.0 rm 4.6 4.5 rm 4.7 Flexible cable (0.4 rm, 0.65 rm, 1.2 rm)
5. wire and cable joint	5.1 Pigtail joint 5.2 T-joint 5.3 Western union joint 5.4 Married joint 5.5 Britannia joint

Evidence Guide

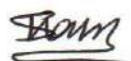
The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.

1. Critical Aspects	Assessment required evidence that the candidate: 1.1. selected proper cables size with proper specification 1.2. removed wire insulation as per proper procedure and measurement 1.3. made of pigtail joint, T-joint, western union joint, Britannia joint and married joint with proper procedure. 1.4. cleaned tools, equipment and materials as per manufacturer instruction 1.5. disposed waste materials in the designated place
2. Underpinning knowledge	2.1. Sizes and current carrying capacity of the cables 2.2. Function, procedure and uses of the pigtail joint, T-joint, western union joint, Britannia joint and married joint 2.3. Tools and equipment used for making joint
3. Underpinning skills	3.1. Handling tools and equipment 3.2. Removing insulation as per requirement from tip point of wire.

	3.3. Planning for own work 3.4. Selecting wired and cable 3.5. Interpreting drawings and symbols
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
5. Resource implications	The following resources must be provided: 5.1. Adequate workplace. 5.2. Tools and equipment. 5.3. Materials are relevant to the relevant to work activity. 5.4. Drawing and specifications relevant to the work.
6. Methods of assessment	Competency should be assessed by 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

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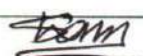
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Unit Code and Title	OUEIM004L2V1: Perform Installation of Electrical Circuit
Nominal Hours	50 Hours
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes to Perform installation of Electrical circuit.</p> <p>It includes Preparing works, controlling one lamp by SPST and SPDT switch, one calling bell from two point, Performing the operation of Fluorescent Lamp (Tube Light) Circuit, and Installing Ceiling Fan with regulator.</p>
Elements of Competency	Performance Criteria
	<u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Prepare for works	1.1. <u>PPE</u> is collected and worn as per job requirement 1.2. Workplace is prepared as per job requirement 1.3. <u>Tools, equipment</u> and <u>materials</u> are collected as per job requirement
2. Control one lamp by SPST and SPDT switch	2.1. Circuit layout is drawn as per drawing 2.2. Circuit materials are placed on the board as per drawing 2.3. <u>Fittings and fixtures</u> are connected and fitted in to circuit as per drawing 2.4. One lamp is controlled by SPST switch 2.5. One lamp is controlled by SPDT switch from two points 2.6. Circuit <u>Test</u> is performed as per SOP
3. Control one calling bell from two point	3.1. Circuit layout is drawn as per drawing 3.2. Circuit materials are placed on the board as per drawing 3.3. Fittings are connected and fitted in to circuit as per drawing 3.4. Circuit connection is checked according to the drawing 3.5. Circuit is tested as per SOP
4. Prepare the circuit of Fluorescent Lamp (Tube Light)	4.1. Circuit layout is drawn as per drawing 4.2. Circuit materials are placed on the board as per drawing 4.3. Fittings and fixtures are connected and fitted in to circuit as per drawing 4.4. Circuit connection is checked according to the drawing 4.5. Circuit is tested as per SOP
5. Install Ceiling Fan with regulator	5.1. Circuit layout is drawn as per drawing 5.2. Circuit materials are placed on the board as per drawing 5.3. Fittings and fixtures are connected and fitted in to circuit as per drawing 5.4. Circuit connection is checked according to the drawing 5.5. Circuit is tested as per SOP
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 Ball pein hammer 2.2 Cutting Pliers 2.3 Combination Pliers 2.4 Wire Striper 2.5 Neon Tester 2.6 Screw Driver (Flat, Philips and connecting) 2.7 Electrician Knife 2.8 Electric hand drill 2.9 AVO meter 2.10 Mager
3. Circuit Materials	3.1 Cable 3.2 Bracket 3.3 Fish Wire 3.4 Elbow 3.5 Bend 3.6 PVC Circular Box 3.7 Rowel plug 3.8 Saddle 3.9 Screw 3.10 Cable Lugs 3.11 Cable tie 3.12 Flexible conduit 3.13 Electric soldering lead 3.14 PVC tape
4. Cables	4.1 PVC single core cable 4.2 PVC twine core cable 4.3 Flexible cable
5. Fitting and fixtures	5.1. Switch boards 5.2. Switches 5.3. Sockets 5.4. Fuses 5.5. MCB 5.6. Fan regulator 5.7. Bracket 5.8. Soccer 5.9. Ballast (Chock coil) 5.10. Starter

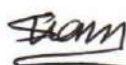


	5.11. Tube light holder 5.12. Batten holder 5.13. Ceiling rose
6. Test	6.1. Continuity test 6.2. Polarity test 6.3. Short circuit test 6.4. Earth continuity test
Evidence Guide The evidence must be authentic, valid, sufficient, reliable, consistent and recent and meet the requirements of the current version of the Unit of Competency.	
1. Critical aspects of competency	Assessment required evidence that the candidate: <ol style="list-style-type: none"> 1.1. identified Circuit diagram and materials 1.2. connected and fitted fittings in to circuit 1.3. controlled one lamp by SPST switch 1.4. controlled one lamp by SPDT switch from two points 1.5. performed circuit test as per SOP 1.6. connected calling bell fittings 1.7. checked circuit connection of calling bell 1.8. connected and fitted fittings and fixtures in to fluorescent lamp circuit 1.9. checked fluorescent lamp circuit connection 1.10. connected and fitted fittings and fixtures in to ceiling fan circuit 1.11. checked ceiling fan circuit connection
2. Underpinning Knowledge	<ol style="list-style-type: none"> 2.1. SPST switch 2.2. Different types of circuit diagram and materials 2.3. Quality & materials 2.4. Continuity test 2.5. Polarity test 2.6. Short circuit test 2.7. Earth continuity test
3. Underpinning Skills	<ol style="list-style-type: none"> 3.1. Interpreting drawing & symbols 3.2. Connecting loads and power 3.3. Handling tools & instruments 3.4. Plan for own work 3.5. Applying circuit testing procedure
4. Underpinning attitudes	<ol style="list-style-type: none"> 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 Respect for rights of peers and seniors in workplace.
5. Resource implications	The following resources must be provided: <ol style="list-style-type: none"> 5.1. Adequate workplace.

	5.2. Tools and equipment appropriate to work activities. 5.3. Materials relevant to the proposed activity. 5.4. Drawings and specifications relevant to the task.
6. Methods of assessment	Competency should be assessed by: 6.1. Oral questioning 6.2. Written test 6.3. Demonstration 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	OUEIM005L2V1: Perform Channel Wiring
Nominal Hours	70 Hours
Unit Descriptor	This unit covers the knowledge, skills and attitudes to Perform Channel Wiring. It includes Preparing works, performing channel wiring, install boards and other accessories of wiring, testing the wiring and Maintaining Workplace Tools and Materials.
Elements of Competency	Performance Criteria
	<u>Bold and Underlined</u> terms are elaborated in the Range of Variables.
1. Prepare for works	1.1. <u>PPE</u> is collected and worn as per job requirement 1.2. Workplace is prepared as per job requirement 1.3. <u>Tools, equipment</u> and <u>materials</u> are collected as per job requirement 1.4. Drawings are collected and interpreted
2. Perform Channel Wiring	2.1. Drawing is selected and collected as per job requirement 2.2. Channel size is identified and selected as per the number and size of cables to be embedded inside 2.3. Lower part of channel is set as per SOP 2.4. PVC cable is laid into the channel as per the diagram 2.5. Upper part of channel is set as per SOP 2.6. Load point is connected with the switch board 2.7. Connection is checked as per SOP 2.8. Performance of circuit is checked
3. Install boards and other accessories of wiring	3.1. <u>Boards</u> are collected and fitted 3.2. Switches, sockets, fan regulator and ballast are fitted 3.3. Switches, sockets and fan regulator are connected to the circuits 3.4. Ceiling rose and different types of holders are fitted 3.5. Those fixtures are connected to the circuit 3.6. <u>MCB</u> , and <u>MCCB</u> are connected and fitted
4. Test the wiring	4.1. Polarity of wiring is checked 4.2. Polarity is justified and checked each of the switches, fuses and circuit breakers 4.3. Circuit breakers are disconnected 4.1. All loads are connected and checked the continuity each of the switches and circuit breakers
5. Maintain Workplace, Tools and Materials	5.1. Tools, equipment and materials are cleaned as per standard 5.2. Defective tools and equipment are identified, separated and reported to the designated person 5.3. Tools, equipment and materials are stored as per workplace procedure 5.4. Workplace is cleaned as per workplace procedure 5.5. Waste materials are disposed in the designated place
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 and equipment	2.1 Calculator 2.2 Multi Meter/AVO Meter 2.3 Wire Stripper 2.4 Chisels: (a) Wooden 2.5 Drill bits 2.6 Files: (a) Flat, (b) Round, (c) Half round 2.7 Hacksaw 2.8 Hammers: (a) Ball peen, (b) Claw (c) Mallet 2.9 Measuring Tapes 2.10 Pliers: (a) Combination Pliers, (b) cutting Pliers, (c) 2.11 Diagonal cutting Pliers, (d) Long Nose Pliers, 2.12 Screwdrivers: (a) Star, (b) Flat, (c) Connecting 2.13 Try square 2.14 Neon Tester 2.15 Wire gauge 2.16 Set squares 2.17 Electrician Knife 2.18 Ladder 2.19 Poker 2.20 Hand Drill Machine
3. Materials	3.1 Channel (1/2", 3/4", 1", 1.25", 1.5" PVC) 3.2 PVC Circular Box 3.3 Rowel plug 3.4 Saddle 3.5 Screw 3.6 Cable Lugs 3.7 Cable tie 3.8 Thread ball 3.9 Insulation tape 3.10 PVC Cable 3.11 Flexible cable
4. Boards	4.1 Switch board 4.2 Ebonite boards
5. Fuses & MCB	5.1 Single pole MCB 5.2 Double pole MCB 5.3 Triple Pole MCCB 5.4 Triple pole with neutral MCB 5.5 Earth leakage circuit breaker (ELCB)
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: <ol style="list-style-type: none"> 1.1. set the channels 1.2. tested the circuit 1.3. connected MCB and MCCB 1.4. connected with loads 1.5. checked polarity 1.6. cleaned workplace 1.7. stored tools & equipment
2. Underpinning Knowledge	<ol style="list-style-type: none"> 2.1. Channel wiring 2.2. Use of fixture and fittings 2.3. Circuit and sub-circuit. 2.4. Test the circuit

3. Underpinning Skills	3.1. Using PPE 3.2. Planning of own work activities 3.3. Selecting appropriate Tools and Equipment 3.4. Selecting appropriate materials 3.5. Using Tools, Equipment and Materials 3.6. Checking specifications 3.7. Locating points & fixtures
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 Respect for rights of peers and seniors in workplace.
5. Resource implications	The following resources must be provided: 5.1. Adequate workplace. 5.2. Tools and equipment appropriate to work activities. 5.3. Materials relevant to the proposed activity. 5.4. Drawings and specifications relevant to the task.
6. Methods of assessment	Competency should be assessed by: 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

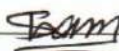
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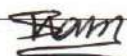
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Unit Code and Title	OUEIM007L2V1: Perform Conduit Wiring
Nominal Hours	75 Hours
Unit Descriptor	This unit covers the knowledge, Skills and attitudes required to perform conduit wiring. It specifically includes collecting tools, equipment and materials, installing conduits and set cables installing boards and other accessories of wiring testing the wiring and Clean the workplace.
Elements of Competency	Performance Criteria Bold and Underlined terms are elaborated in the Range of Variables.
1. Collect tools, equipment and materials	1.1. <u>PPEs</u> are collected and used 1.2. <u>Hand tools</u> , <u>power tools</u> , <u>equipment</u> and <u>materials</u> are checked for usability 1.3. Drawings are collected and interpreted
2. Install conduits and set cables	2.1. Layout is drawn on the wall as per drawing 2.2. Wall is cut and grooved 2.3. Collected conduits are cut and set 2.4. Conduits are installed on the wall and clamped 2.5. Fish wires are measured and cut 2.6. Fish wire is inserted 2.7. Collected cables are cut 2.8. Cables are tied with fish wire and insert into the conduit
3. Install boards and other accessories of wiring	3.1. <u>Boards</u> are collected and fitted 3.2. Switches, sockets, fan regulator and ballast are fitted 3.3. Switches, sockets and fan regulator are connected to the circuits 3.4. Ceiling rose and different types of holders are fitted 3.5. Those fixtures are connected to the circuit 3.6. <u>MCB</u> , and <u>MCCB</u> are connected and fitted
4. Test the wiring	4.1 Polarity of wiring is checked 4.2 Polarity is justified and checked each of the switches, fuses and circuit breakers 4.3 Circuit breakers are disconnected 4.4 All loads are connected and checked the continuity each of the switches and circuit breakers
5. Maintain Workplace, Tools and Materials	5.1 Tools, equipment and materials are cleaned as per standard 5.2 Defective tools and equipment are identified, separated and reported to the designated person 5.3 Tools, equipment and materials are stored as per workplace procedure 5.4 Workplace is cleaned as per workplace procedure 5.5 Waste materials are disposed in the designated place
Range of Variables	



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Variables	Range (may include but not limited to):
1. PPE	1.1 Hand gloves 1.2 Helmet 1.3 Goggles 1.4 Safety shoes
2. Tools and equipment	2.1 Adjustable wrench 2.2 Wire stripper 2.3 C-clamp 2.4 Chisels: (a) Wooden, (b) Cold 2.5 Drill bits 2.6 Files: (a) Flat, (b) Round, (c) Half round 2.7 Hacksaw 2.8 Hammers: (a) Ball pin, (b) Claw 2.9 Hand drill 2.10 Measuring Tapes 2.11 Paint Brushes/Rollers 2.12 Pliers: (a) Combination Pliers, (b) cutting Pliers, (c) Diagonal cutting Pliers, (d) Long Nose Pliers, 2.13 Punches 2.14 Screwdrivers: (a) Star, (b) Flat, (c) Connecting 2.15 Tri square 2.16 Neon tester 2.17 Wire cutters 2.18 Wire gauge 2.19 Set squares 2.20 Electrician knife 2.21 Ladder 2.22 Fish wire 2.23 Calculator 2.24 Multi meter/AVO meter 2.25 Electric hand drill machine 2.26 Hand grinders 2.27 Soldering iron
3. Materials	3.1 Conduit 3.2 Socket 3.3 GI Wire 3.4 Elbow 3.5 Bend 3.6 Circular box 3.7 Rowel plug 3.8 Saddle 3.9 Screw 3.10 Cable lugs 3.11 Cable tie 3.12 Thread ball and blue 3.13 Flexible conduit 3.14 Electric soldering lead 3.15 Insulating tape 3.16 Cable (PVC, VIR)



4. Boards	4.1 Wooden board 4.2 Plastic boards
5. Fuses & MCB	5.1 Single pole MCB 5.2 Double pole MCB 5.3 Triple Pole MCCB 5.4 Triple pole with neutral MCB 5.5 Earth leakage circuit breaker (ELCB)
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 drawn layouts for wiring 1.2 installed conduit and cables. 1.3 connected MCB and MCCB 1.4 tested polarity, continuity, short circuit and earth continuity as per SOP 1.5 cleaned workplace 1.6 stored tools and equipment
2. Underpinning Knowledge	2.1 Conduit wiring 2.2 Function of MCB & MCCB 2.3 Earth leakage circuit breaker 2.4 Fish wire 2.5 Different types of fittings and fixtures 2.6 Types of switches, sockets, and ceiling rose, fittings and fixtures. 2.7 Specification checking. 2.8 Fittings and fixture installation procedure. 2.9 Procedure of performing tests 2.10 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	<p>Methods of assessment may include but not limited to:</p> <p>6.1 Written test</p> <p>6.2 Demonstration</p> <p>6.3 Oral questioning</p> <p>6.4 Portfolio</p>
7. Context of Assessment	<p>7.1 Competency assessment must be done in NSDA accredited assessment centre</p> <p>7.2 Assessment should be done by a NSDA certified/nominated assessor</p>

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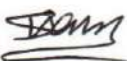

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Review of Competency Standard

The Competency Standards for National Skills Certificate in **Electrical Installation and Maintenance** Standard is Reviewed by NSDA on 08 January, 2021.

Respectable members:

1.	Dulal Krishna Saha, Executive Chairman (Secretary), National Skills Development Authority (NSDA)	Chairperson
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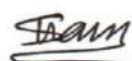

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Validation of Competency Standard by Standard and Curriculum Validation Committee (SCVC)

The Competency Standards for National Skills Certificate in **Electrical Installation and Maintenance** Standard is validated by SCVC on 09 January, 2021.

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This Competency Standard for **Electrical Installation and 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 for individuals who graduated through the established standard via competency-based assessment to be suitably qualified for a relevant job.

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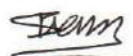
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