COMPETENCY STANDARD

Plumbing

Level: 1

(Construction Sector)

Competency Standard Code: CS-CON-PLMB-EN-L1-V1

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

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This Competency Standard for **Plumbing** 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 ISC, 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 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 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. **Plumbing** 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 students enrolled in skills training. Trainees who successfully pass the assessment will receive a qualification in the National Skills Qualification Framework (NSQF) under Bangladesh National Qualification Framework (BNQF) 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 Un and corresponding Elements
- the Competency Standard that includes the Unit of Competency, Unit Descriptor, Elements and Performanc Content Guide and Assessment Evidence Guide.

Competency Standards for National Skill Certificate – 1 in Plumbing 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, Second

CON – Construction Sector

NSDA- National Skills Development Authority

MKS – Meter, Kilogram, Second

BNQF- Bangladesh National Qualifications Framework

OSH – Occupational Safety and Health

PPE – Personal Protective Equipment

PLMB - Plumbing

SS – Stainless Steel

SCVC- Standards and Curriculum Validation Committee

STP – Skills Training Provider

SOP – Standard Operating Procedure

UoC - Unit of Competency

Approved by
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Contents

National Competency Standards for National Skill Certificate in Plumbing, Level 1 in Construction Sector

Course Structure

SL	Unit Code and Title		UoC Level	Nominal Hours
Generic Units of Competencies				**30**
1.	GU-02-L2-V1	Perform computations using basic mathematical concepts	1	15
2.	GU-05-L3-V1	Apply Occupational Safety and Health (OSH) Procedure in the Workplace	1	15
Sector Specific Units of Competencies				**15**
3.	SU-CON-01-L2-V1	Interpret Drawings, Manuals and Plans	2	15
Occupation Specific Units of Competencies				**270**
4.	OU-CON-PLUMB-01-L1-V1	Use Hand Tools and Power Tools		20
5.	OU-CON-PLUMB-02-L1-V1	Fabricate and Prepare Pipes for Installation		60
6.	OU-CON-PLUMB-03-L1-V1	Make Pipe Joints		60
7.	OU-CON-PLUMB-04-L1-V1	Perform Conceal Works		50
8.	OU-CON-PLUMB-05-L1-V1	Install Water Supply Line		80
Nominal Hours				**315**
Workplace Visit				**20**
Total Nominal Hours				**335**

Units & Elements at a Glance:

Generic Competencies (30 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GU-01-L1-V1	Perform Computation Using Basic Mathematical Concept	1. Identify calculation requirements in the workplace 2. Select appropriate mathematical methods for the calculation. 3. Use tool/instrument to perform calculations	15
GU-02-L2-V1	Apply Occupational Safety and Health (OSH) Procedure in the Workplace	1. Identify OSH policies and procedures. 2. Follow OSH procedure 3. Report hazards and risks 4. Respond to emergencies 5. Maintain personal well-being	15
		Hours	**30**

Sector Specific Competencies (15 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
SU-CON-01-L2-V1	Interpret Technical Drawings, Manuals and Plans	1. Analyze signs, symbols and data 2. Interpret technical drawings and plans 3. Create freehand sketching 4. Identify and access manuals / specification 5. Interpret and apply information in manuals /specification	15
Total Hours			**15**

Occupation Specific Competencies (270 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
OU-CON-PLMB-01-L3-V1	Use Hand Tools and Power Tools	1. Prepare for work 2. Use hand tools 3. Use power tools 4. Perform basic preventive maintenance. 5. Maintain workplace cleanliness and store tools	20
OU-CON-PLMB-02-L3-V1	Fabricate and Prepare Pipes for Installation	1. Prepare for work 2. Cut GI and UPVC thread pipes 3. Cut CPVC and PPR pipes 4. Make threads on GI pipe and uPVC thread pipe 5. Maintain workplace cleanliness and store tools	60
OU-CON-PLMB-03-L1-V1	Make Pipe Joints	1. Prepare for work 2. Make joints of GI pipe and uPVC thread pipe 3. Make joints of CPVC pipe and uPVC Pipe 4. Make joints of PPR pipe 5. Maintain workplace cleanliness and store tools	60

OU-CON-PLMB-04-L1-V1	Perform Conceal Work for Plumbing works	1. Prepare for work 2. Cut wall 3. Lay-out pipe 4. Maintain workplace cleanliness and store tools	50
OU-CON-PLMB-05-L1-V1	Install Water Supply line	1. Prepare for work 2. Cut threads 3. Make joints with fittings 4. Install pipes 5. Maintain workplace cleanliness and store tools	80
Total Hours			**270**

Generic Units of Competencies

Unit Code and Title	GU-01-L1-V1: Perform Computations Using Basic Mathematical Concepts
Unit Descriptor	This unit of competency requires the knowledge, skills and attitude to perform computations using basic mathematical concepts in the workplace. It specifically includes the tasks of identifying calcula requirements in the workplace, selecting appropriate mathema method/concept for the calculation and using appropriate instrum tools to perform calculation.
Nominal Hours	**15 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables Training Components
1. Identify calculation requirements in the workplace	1.1 Job requirements are identified 1.2 **Measurements** are selected in accordance with job requirement 1.3 Calculation requirements are identified from **workplace information**
2. Select appropriate mathematical methods for the calculation.	2.1 Mathematical methods are identified 2.2 **Appropriate method** is selected to carry out the calculati on requirements 2.3 Tolerance and clearance limits are identified and adjusted according to the job requirements
3. Use tool/instrument to perform calculations	3.1 Work instructions are confirmed and applied to the job in hand 3.2 Materials to be measured are identified as per job specification 3.3 Appropriate **tool/ instrument** is selected based on materials to be measured
Range of Variables	
Variable	**Range** (may include but not limited to)
1. Measurements	1.1 Length 1.2 Width 1.3 Weight 1.4 Tolerance
2. workplace information	2.1 Job Order 2.2 Design 2.3 Working drawing 2.4 Verbal instructions 2.5 Written Instruction
3. Appropriate method	3.1 Addition 3.2 Subtraction

	3.3 Division 3.4 Multiplication 3.5 Conversion 3.6 Percentage and ratio calculation
4. Tool/ Instrument	4.1 Calculator 4.2 Scale 4.3 Measuring tape 4.4 Marker
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 calculation requirements from workplace information 1.2 Selected appropriate method to carry out the calculation requirements 1.3 Selected measurements 1.4 Selected appropriate methods 1.5 Used tool/instrument 1.6 Added numbers 1.7 Subtracted numbers 1.8 Multiplied numbers. 1.9 Divided numbers. 1.10 Completed calculations using appropriate tools/instruments
2. Underpinning Knowledge	2.1. Numerical concept 2.2. Basic mathematical methods such as addition, subtraction , multiplication and division and percentage. 2.3. Mathematical language, symbols and terminology. 2.4. Measuring units
3. Underpinning Skills	3.1 Interpreting numerical concept 3.2 Interpreting mathematical methods such as addition, subtraction, multiplication and division and percentage. 3.3 Interpreting mathematical language, symbols and terminology. 3.4 Interpreting measuring units.
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. Work place 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	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 a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an 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	**GU-02-L1-V1: 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 OSH policies and procedures, following OSH procedure, reporting to emergencies, and maintaining personal well-being.
Nominal Hours	**15 Hours**
Elements of Competency	**Performance Criteria** **Bold & Underlined** terms are elaborated in the Range of Variables
1. Identify OSH policies and procedures.	1.1. **OSH policies** and **safe operating procedures** are accessed and stated 1.2. **Safety signs and symbols** 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 **Personal protective equipment (PPE)** 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 **Hazards** 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 **emergency procedures** are followed 4.3 **Contingency measures** during workplace accidents, fire and other emergencies are recognized and followed in accordance with organization procedures 4.4 Frist 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 **"Fit to work" records** are updated and maintained according to workplace requirements.
Range of Variables	

Variables	**Range** (may include but not limited to):
1. OSH Policies	1.1. Bangladesh standards for OHS 1.2. Fire Safety Rules and Regulations 1.3. Code of Practice 1.4. Industry Guidelines
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: 1.1 stated OSH 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
2. Underpinning knowledge	2.1 Define OSH 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 OSH 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 Workplace 5.2 Equipment and outfits appropriate in applying safety measures 5.3 Tools, materials and documentation required 5.4 OSH Policies and Procedures
6. Methods of assessment	Assessment methods 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 a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an 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 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-CON-01-L1-V1: Interpret Technical Drawings, Manuals and Plans
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to interpret technical drawings and plans. It specifically includes the tasks of analyzing signs, symbols and data, interpreting technical drawings and plans, creating freehand sketching, identifying and accessing manuals / specification, interpreting and applying information in manuals /specification
Nominal Hours	**15 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the range of variables
1. Analyse signs, symbols and data	1.1 **Technical plans** are obtained according to job requirements 1.2 Signs, symbols and data are identified according to job specifications 1.3 Signs symbols and data are analyzed according to **classification** and **drawing**
2. Interpret technical drawings and plans	2.1 Necessary tools, materials and equipment are identified according to the plan 2.2 Supplies and materials are listed according to specifications 2.3 Components, assemblies or objects are determined as required 2.4 Dimensions are identified as appropriate to the plan 2.5 Specification details are matched with existing / available resources and in line with job requirements 2.6 **Work plan** is prepared following the specifications
3. Create freehand sketching	3.1 Freehand sketching requirements are identified 3.2 **Tools and materials** are selected and collected for freehand sketching 3.3 Freehand sketching is drawn in accordance with the job requirements
4. Identify and access manuals / specification	4.1 **Manuals** are identified and accessed as per job requirements 4.2 Version and date of manual are checked to ensure that correct specification and procedures are identified
5. Interpret and apply information in manuals /specification	5.1 Relevant sections, chapters of specifications/ manuals are determined in relation to the work to be conducted 5.2 Information and procedure in the manual are interpreted according to job requirements 5.3 Work steps are correctly identified in accordance with manufacturer's specification 5.4 Manual data are applied according to the given task 5.5 Correct sequencing and adjustments are interpreted in accordance with information contained in the manual

	or specifications 5.6 Manual or specification is stored in accordance with workplace requirements
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Technical Plans	1.1 Electrical plans 1.2 Structural plans 1.3 Architectural plans 1.4 Plumbing plans 1.5 Welding Procedures Specifications (WPS) 1.6 Piping and instrument diagram 1.7 Piping isometric 1.8 Plot plans 1.9 Piping class sheet 1.10 Piping support details and hanger drawings
2. Classification	2.1 Electrical 2.2 Mechanical 2.3 Plumbing
3. Drawing	3.1 Drawing symbols 3.2 Alphabet of lines 3.3 Orthographic views 3.4 Front view 3.5 Right side view/left side view 3.6 Top view 3.7 Pictorial 3.8 Schematic diagram 3.9 Electrical drawings 3.10 Structural drawings 3.11 Plumbing drawings 3.12 Water line 3.13 Sewerage/Drainage 3.14 Ventilation 3.15 Welding symbols
4. Work plan	4.1 Job requirements 4.2 Installation instructions 4.3 Components instruction
5. Tools and materials	5.1 Compass 5.2 Pencil 5.3 Marker 5.4 Drawing paper 5.5 Divider

	5.6 Rulers 5.7 Triangles
6. Manuals	6.1 Manufacturer's Specification Manual 6.2 Repair and Maintenance Manual 6.3 Servicing Manual
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 and determined signs, symbols and data 1.2 identified tools and equipment in accordance with job requirements 1.3 listed supplies and materials according to blueprint specifications 1.4 drawn work plan following specifications 1.5 demonstrated ability to determine job specifications
2. Underpinning knowledge	2.1 Linear measurement 2.2 Dimension 2.3 Unit conversion 2.4 Electrical plan 2.5 Mechanical plan 2.6 Symbols and abbreviations 2.7 Drawing standard symbols 2.8 Basic technical drawing 2.9 Types technical plans 2.10 Various types of drawings 2.11 Notes and specifications
3. Underpinning Skills	3.1 Interpreting drawing/orthographic drawing 3.2 Interpreting technical plans 3.3 Matching specification details with existing resources 3.4 Following instructions 3.5 Handling of drawing instruments
4. Required 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 Implication	The following resources must be provided: 5.1 Relevant tools, Equipment, software and facilities needed to perform the activities. 5.2 Required learning 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 a training center or in an actual or simulated workplace after completion of the training module 7.2 Assessment should be done by NSDA certified/ nominated assessor

Accreditation Requirements

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Occupation Specific Units of Competencies

Unit Code and Title	**OU-CON-PIMB-01-L1-V1: Use Hand Tools and Power Tools**
Unit Descriptor	This unit covers the skills, knowledge and attitude required in using hand tools and power tools. It includes preparing for work, using hand tools, using power tools, performing basic preventive maintenance and maintaining workplace cleanliness and storing tools
Nominal Hours	**20 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the Range of Variables.
1. Prepare for work	1.1 OSH is followed throughout the work process 1.2 **Personal Protective Equipment (PPE)** is collected and worn as per requirement 1.3 **Hand tools** and **power** tools are identified a as per requirement 1.4 **Applications** of tools are defined and prepared for use as per requirement 1.5 1.6 Sources of power supply for power tools are identified.
2. Use hand tools	2.1 Hand tools are used safely 2.2 Proper hand-eye coordination is applied in the use of hand tools. 2.3 Unsafe or faulty tools are identified and marked for repair.
3. Use power tools	3.1 Route for power supply is identified in accordance with work safety requirements 3.2 Proper hand-eye coordination is applied in the use of power tools. 3.3 3.4 Proper sequence of operations is determined in using power tools 3.5 Power tools are used as required.
4. Perform basic preventive maintenance.	4.1. Tools are cleaned as per standard procedure 4.2. lubricants are identified as per requirement 4.3. Tools are lubricated as required 4.4. Defective tools are inspected and corrected or replaced as per standard procedure 4.5. Tools are inspected, repaired and replaced after use.

5. Maintain workplace cleanliness and store tools	5.1 Workplace is cleaned as per standard procedure. 5.2 Hazardous materials are identified, separated and disposed as per workplace procedure. 5.3 Waste materials are collected and disposed as per environmental requirement 5.4 Tools are cleaned and stored safely in appropriate location.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Personal Protective Equipment (PPE)	1.1. Dust mask 1.2. Safety glasses/Goggles 1.3. Hand Gloves 1.4. Safety shoes/boots 1.5. Aprons 1.6. Overalls 1.7. Helmet 1.8. Safety belt 1.9. Air plug
2. Applications	2.1 Adjusting 2.2 Aligning 2.3 Assembling 2.4 Boring 2.5 Clamping 2.6 Cleaning 2.7 Cutting 2.8 Dismantling 2.9 Finishing 2.10 Hand sharpening 2.11 Lubricating 2.12 Scraping 2.13 Simple Tool Repairs 2.14 Threading 2.15 Tightening

3. Hand tools	3.1 Adjustable wrench 3.2 Pipe wrench 3.3 Bench vice 3.4 Pipe vice 3.5 Cold Chisels 3.6 Die stock with die 3.7 Files 3.8 Hacksaw 3.9 Hammers 3.10 hammer 3.11 Measuring Tapes 3.12 Oil can 3.13 Steel wire brush 3.14 Pipe cutter ▪ GI pipe cutter ▪ PPR/CPVC pipe cutter 3.15 Sprit level 3.15 Pliers 3.16 Plumb bob 3.17 Screwdrivers 3.18 Shovel/Spades 3.19 Trowels 3.20 Floats 3.21 Try square 3.22 Industrial plug and socket (For power line)
4. **Power Tools**	4.1 Drill machine 4.2 Angle Grinder/ Hand Grinder 4.3 Portable pipe threading machine 4.4 Hand hammer drill machine 4.5 PPR welding machine
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 worn PPE 1.2 used hand tools and power tools safely 1.3 determined proper sequence of operations in using power tools. 1.4 inspected, separated and corrected of defective tools. 1.5 lubricated tools 1.6 cleaned Workplace and store tools

2. Underpinning knowledge	2.1 Hand tools and their uses 2.2 Power tools and their uses 2.3 Application of hand & power tools 2.4 Procedures using of hand tools and power tools 2.5 Preventive maintenance 2.7 Storage procedures
3. Underpinning skills	3.1 Practicing OSH 3.2 Identifying of required tools 3.3 Applying standard procedure 3.4 Using hand tools safely 3.5 Using power tools safely 3.6 Performing preventive maintenance 3.7 Communicating skills in the workplace
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 follow Instruction 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates and seniors in workplace
5. Resource implications	5.1 Adequate workplaces 5.2 Materials for plumbing work 5.3 Hand tools and power tools appropriate to plumbing work 5.4 Information and documentation 5.5 Manual, Codes, Standards and reference materials
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 a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an NSDA certified/ nominated assessor

Accreditation Requirements

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Unit Code and Title	**OU-CON-PLMB-02-L1-V1: Fabricate and Prepare Pipes for Installation**
Unit Descriptor	This unit covers the knowledge, skills and attitude required to fabricate and prepare pipes for installation. It includes preparing for work, cut GI and UPVC thread pipes, cut CPVC and PPR pipes, making threads on GI pipe and uPVC thread pipe and maintaining workplace cleanliness and store tools
Nominal Hours	**60 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the Range of Variables.
1. Prepare for work	1.1. OSH is followed throughout the work process 1.2. **PPE** is collected and worn as per requirement. 1.3. Workplace safety and health procedure is maintained as per workplace standard. 1.4 **Tools, equipment and materials** are selected and collected as per job requirement. 1.5 **Size of pipes** is selected as per drawing and specification. 1.6 **Types of Pipe** are selected and collected as required.
2. Cut GI and UPVC thread pipes	2.1 Pipes are measured and marked as per job requirement. 2.2 Pipes are hold and clamped with vice. 2.3 Pipes are cut as per following standard procedure. 2.4 Cutting edge is cleaned as per standard procedure.
3. Cut CPVC and PPR pipes	3.1 Pipes are measured and marked as per job requirement. 3.2 Pipes are hold by hand. 3.3 Pipes are cut using **cutting tools**.
4. Make threads on GI pipe and uPVC thread pipe	4.1 Pipes are hold and clamped with pipe vice. 4.2 Die-stocks are adjusted as required. 4.3 Thread cutting is performed as per standard procedure. 4.4 Cutting oils are used as per requirement. 4.5 Pipe ends and thread is cleaned as per standard procedure. 4.6 **Quality** of thread is checked
5. Maintain workplace cleanliness and store tools	5.1 Workplace is cleaned as per standard procedure. 5.2 Hazardous materials are identified, separated and disposed as per workplace procedure. 5.3 Waste materials are disposed as per workplace procedure. 5.4 Tools are cleaned and stored safely in appropriate location.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. PPE	1.1. Dust mask. 1.2. Safety Goggles.

	1.3. Safety shoes. 1.4. Apron. 1.5. Hand Gloves. 1.6. Air plug 1.7. Safety belt 1.8. Helmet 1.9. Apron
2. Tools and equipment	2.1 Measuring tape. 2.2 Hacksaw. 2.3 Files 2.5 Thread gauge 2.6 Pipe cutter 2.7 die stock with die 2.8 oil can 2.9 Steel wire brush 2.10 Vice
3. Materials	3.1 Pipes 3.2 Cutting oil 3.3 Marker 3.4 Hacksaw blade 3.5 Cotton waste 3.6 Die/jaws
4. Size of pipes	4.1 12 mm dia. 4.2 16 mm dia. 4.3 25 mm dia. 4.4 32 mm dia. 4.5 40 mm dia. 4.6 50 mm dia. 4.7 62 mm dia. 4.8 75 mm dia. 4.9 100 mm dia.
5. Types of Pipe	5.1 G.I. Pipe. 5.2 PVC pipe 5.3 uPVC pipe. 5.4 uPVC thread pipe. 5.5 PPR pipe 5.6 CPVC pipe
6. Cutting tools	6.1 Hack saw 6.2 pipe cutter 6.3 PPR pipe cutter
7. Quality of thread	7.1 TPI 7.2 Thread depth

	7.3 Thread angle
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 collected and worn PPE 1.2 selected and collected Tools and equipment. 1.3 selected pipe sizes. 1.4 cut pipes. 1.5 threaded pipes.
2. Underpinning knowledge	2.1 Tools and Equipment 2.2 Measurement and calculation. 2.3 Pipe cutting method. 2.4 Nomenclature of thread 2.5 Thread measurement 2.6 Use of cutting oil 2.8 Pipes and tubes 2.9 Pipes sizes 2.10 Types of pipes
3. Underpinning Skills	3.1 Preparing Tools Equipment & materials. 3.2 Planning for work activities 3.3 Using of plumbing tools and equipment. 3.4 Measuring length and dimension of pipes 3.5 Applying cutting and threading techniques of pipes 3.6 checking thread quality
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 follow Instruction 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates 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 relevant to perform activity. 5.4 Drawing and specifications relevant to the task.

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 a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an NSDA certified/ nominated assessor

Accreditation Requirements

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Unit Code and Title	OU-CON-PLMB-03-L1-V1: Make Pipe Joints
Unit Descriptor	This unit covers the knowledge, skills and attitude required to make pipe joints. It includes preparing for work, making joints of GI pipe and uPVC thread pipe, making joints of CPVC pipe and uPVC Pipe, making joints of PPR pipe and maintaining workplace cleanliness and store tools.
Nominal Hours	**60 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the Range of Variables.
1. Prepare for work	1.1 OSH is followed throughout the work process 1.2 **Personal protective equipment (PPE)** is collected and worn as per requirement. 1.3 Workplace safety and health procedure is maintained as per workplace standard. 1.4 **Tools and equipment** are selected and collected as required. 1.5 **Materials and consumables** are selected and collected as per requirement. 1.6 **Pipes** are selected and collected as required.
2. Make joints of GI pipe and uPVC thread pipe	2.1 Threaded pipes are selected and collected according to job requirement. 2.2 Pipe is fixed with pipe vice or pipe wrench. 2.3 Teflon tape is spired on the external threaded of pipe. 2.4 **Fittings** are selected & fixed with pipes. 2.5 Pipe & fitting are tighten using pipe wrench and adjustable wrench. 2.6 Leakage is checked with compressor machine /water supply.
3. Make joints of CPVC pipe and uPVC Pipe	3.1 **Pipes** are selected and collected according to job requirement. 3.2 Types of Pipe **joint** is selected. 3.3 Pipe ends is cleaned prior to fit-up. 3.4 Trial **fitting** is performed prior to final fit-up. 3.5 Joint of pipe is plastered using solvent cement. 3.6 Pipe is fixed with fittings safely. 3.7 Leakage is checked initially with water supply after 45 minutes 3.8 Leakage is finally checked after 24 hours with water supply

4. Make joints of PPR pipe	4.1 PPR pipe and **fittings** are selected and collected according to job requirement. 4.2 Type of joint for PPR pipe is selected. 4.3 Trial fitting is performed prior to final fit-up. 4.4 PPR pipes are fixed with fittings following line alignment and diameter using PPR welding machine safely. 4.5 Leakage is checked with water supply after 25 minutes
5. Maintain workplace cleanliness and store tools	5.1 Workplace is cleaned as per standard procedure. 5.2 Hazardous materials are identified, separated and disposed as per workplace procedure. 5.3 Waste materials are disposed as per workplace procedure. 5.4 Tools are cleaned and stored safely in appropriate location.
Range of Variables	
Variables	**Range** (may include but not limited to):
1. Personal protective equipment (PPE)	1.1 Dust mask 1.2 Goggles 1.3 Safety shoes 1.4 Apron 1.5 Gloves 1.6 Helmet 1.7 Ear plug 1.8 Safety Belt
2. Tools and equipment	2.1 Pipe Cutter 2.2 hack saw 2.3 Ball peen Hammer 2.4 Pipe wrench 2.5 Adjustable wrench 2.6 Pipe vice 2.7 Die stock with die set 2.8 Air compressor
3. Materials and consumables	3.1 Thread tape/Sealing tape 3.2 Adhesive solution 3.3 Waste cotton 3.4 Solvent cement 3.5 Pipe fittings as per joint
4. Pipes	4.1 GI 4.2 PVC 4.3 uPVC 4.4 uPVC thread pipe

	4.5 PPR 4.6 CPVC 4.7
5. Fittings for GI Pipe joints	5.1 Elbow 5.2 Tee 5.3 Union 5.4 Cross 5.5 Socket 5.6 Reducer elbow 5.7 Reducer socket 5.8 Reducer tee 5.9 Bend 5.10 Crossover bend 5.11 Nipple 5.12 Bush 5.13 Plug 5.14 End cap 5.15 Reducer bush
6. Fittings for CPVC/ uPVC pipe joints	6.1 Tee-joint 6.2 Cross joint 6.3 Reducer 6.4 Union 6.5 Socket 6.6 Cap joint 6.7 Bend joint (male / female) 6.8 Plug 6.9 Cap 6.10 Y-Joint 6.11 Elbow (Male and female) 6.12 Male female connector
7. Fittings for PPR Pipe Joints	7.1 Elbow (male / female) 7.2 Brass elbow 7.3 Tee (male / female) 7.4 Brass Tee 7.5 Union (male / female) 7.6 Cross 7.7 Reducer elbow 7.8 Cap 7.9 Plug 7.10 Socket 7.11 Reducer tee 7.12 Reducer socket 7.13 Bridge

8. Pipe joints	8.1 Y-joint 8.2 Cross 8.3 Tee 8.4 Elbow 8.5 Bend 8.6 Socket
Evidence Guide The evidence must be authentic, valid, sufficient, reliable and consistent to meet the requirements of the current version of the unit of competency.	
1. Critical Aspects	Competency assessment requires evidence that the candidate: 1.1 selected materials in accordance with specification and requirement. 1.2 made joint with fittings. 1.3 checked joints and rectified defects as required. 1.4 performed leak test
2. Underpinning knowledge	2.1 Measurements (linear and angular) 2.2 Different types of joints. 2.3 Pipe fittings for different types of joint and pipes. 2.4 Economic use of materials. 2.5 Fittings for GI Pipe joints 2.6 Fittings for CPVC / uPVC pipe joints 2.7 Fittings for PPR joints 2.8 Leakage test process
3. Underpinning skills	3.1 Planning for own work. 3.2 Interpreting drawing and specification. 3.3 Preparing materials. 3.4 Handling hand tools and power tools. 3.5 Applying the techniques of different pipe joints 3.6 Testing leakage of joint
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 follow Instruction 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates and seniors in workplace
5. Resource implications	The following resources must be provided: 5.1. Adequate Workplace 5.2. Tools and equipment required for work activities 5.3. Materials relevant to work activity

	5.4. Drawing and specifications relevant to the task.
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 a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an NSDA certified/ nominated assessor

Accreditation Requirements

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Unit Code and Title	**OU-CON-PLMB-04-L2-V1: Perform Conceal Work for Plumbing works**
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to perform conceal work for plumbing works. It includes preparing for work, cutting wall, laying-out pipe and maintaining workplace cleanliness and store tools.
Nominal Hours	**50 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the Range of Variables.
1. Prepare for work	1.1 **Personal protective equipment (PPE)** is collected and worn as per requirement. 1.2 Workplace safety and health procedure is maintained as per workplace standard. 1.3 **Tools and equipment** are collected as required. 1.4 Work instruction is interpreted as per requirement.
2. Cut wall	2.1 **Pipes** Lay-out diagram in wall are drawn as per working drawing 2.2 Necessary precaution is taken to prevent causing damage to floors/walls and adjacent installations during cutting. 2.3 walls are cut as per layout 2.4 **Faults** are identified and rectified as required
3. Lay-out pipe	3.1. Work instructions are read and interpreted. 3.2. **Materials** are collected as per requirements. 3.3. Pipes are laid out as per cutting grooves. 3.4. Alignment of laid pipes are done as required. 3.5. Faults of layout are checked and rectified as required. 3.6. Pipes are jammed in grooves as required.
4. Maintain workplace cleanliness and store tools	4.1. Workplace is cleaned as per standard procedure. 4.2. Hazardous materials are identified, separated and disposed as per workplace procedure. 4.3. Waste materials are disposed as per workplace procedure. 4.4. Tools are cleaned and stored safely in appropriate location.
Range of Variables	
Variable	**Range** (may include but not limited to):
1. Personal protective equipment (PPE)	1.1. Gloves 1.2. Helmet 1.3. Safety shoes 1.4. Goggles 1.5. Ear plug 1.6. Safety belt with accessories

2. Tools and equipment	2.1 Ball peen hammer 2.2 Cold chisel 2.5 Angle grinder 2.6 Spirit level 2.7 Shovel 2.8 Trowel 2.9 Steel tape 2.10 Try square 2.11 Steel pan 2.12 Plumb bob 2.13 Wooden float 2.14 Hammer drill 2.15 Bucket 2.16 Mug 2.17 Wire brush
3. Pipes	3.1. GI 3.2. PVC 3.3. uPVC 3.4. uPVC thread pipe 3.5. PPR 3.6. CPVC
4. Faults	4.1 Plaster faults 4.2 Size of groove is small or large
5. Materials	5.1 Cement 5.2 Sand 5.3 Nails 5.4 Brick chips 5.5 Grinding disk 5.6 Hammer chisel 5.7 Flower broom
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. worn PPE. 1.2. interpreted work instructions according to requirements. 1.3. performed pipe layout. 1.4. cut walls according to lay-out. 1.5. followed safety regulations applicable to work site operations. 1.6. identified faults and rectified cutting groove.

2. Underpinning Knowledge	2.1. Layout 2.2. Cutting procedure of wall 2.3. Plumbing symbols 2.4. Safety precautions in cutting walls 2.5. Pipe Jamming process 2.6. Uses of grinding disk 2.7. Procedure of setting grinding disk
3. Underpinning Skills	3.1. Interpreting drawing and instruction. 3.2. Preparing materials. 3.3. Performing basic masonry and cement concrete works. 3.4. Handling hand tools and power tools. 3.5. Applying the techniques of wall cutting 3.6. Applying the process of laying pipes
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 follow Instruction 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates and seniors in workplace.
5. Resource implications	The following resources must be provided: 5.1. Adequate Workplace 5.2. Tools and equipment required for work activities 5.3. Materials relevant to work activity 5.4. Drawing and specifications relevant to the task.
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 a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an NSDA certified/ nominated assessor

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Unit Code and Title	OU-CON-PLMB-05-L1-V1: Install Water Supply line
Unit Descriptor	This unit covers the knowledge, skills and attitudes required to Install water supply and waste water pipeline. It includes preparing for work, cutting threads, making joints with fittings, installing pipes and maintain workplace cleanliness and store tools
Nominal Hours	**80 Hours**
Elements of Competency	**Performance Criteria** **Bold and Underlined** terms are elaborated in the Range of Variables.
1. Prepare for work	1.1 **Personal protective equipment (PPE)** is collected and worn as per requirement. 1.2 Safety and health procedure is maintained as per workplace standard. 1.3 **Tools and equipment** are selected and collected. 1.4 **Size of pipes** is selected as per requirements. 1.5 **Pipes** are selected and collected as job requirement 1.6 **Fittings** are selected and Collected as per job requirement
2. Cut threads	2.1. Pipes are hold and clamped with pipe vice. 2.2. Die-stocks are adjusted as required. 2.3. Thread cutting is performed as per standard procedure. 2.4. Cutting oils are used during operation as per requirement. 2.5. Pipe ends and thread is cleaned as per standard procedure. 2.6. Cutting threads are checked and adjusted as required.
3. Make joints with fittings	3.1 Pipe **joints** are selected as required. 3.2 Pipes are gripped in vice for joining fittings. 3.3 Pipes are joined with **fittings** as per standard procedure. 3.4 Measurements are taken as per requirements. 3.5 Leak test is performed following standard procedure.
4. Install pipes	4.1 Pipes Lay-out diagram in wall are drawn as per working drawing 4.2 Necessary precaution is taken to prevent causing damage to floors/walls and adjacent installations during cutting. 4.3 Walls are cut as per layout 4.4 Pipes are installed as per requirement 4.5 **Installation criteria** are checked for quality
5. Maintain workplace cleanliness and store tools	5.1 Workplace is cleaned as per standard procedure. 5.2 Hazardous materials are identified, separated and disposed as per workplace procedure. 5.3 Waste materials are disposed as per workplace procedure. 5.4 Tools are cleaned and stored safely 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. Safety shoes 1.4. Goggles 1.5. Ear plug 1.6. Hand gloves 1.7. Safety belt
2. Tools and equipment	2.1 Ball peen hammer 2.2 Cold chisel 2.3 Die stock with die 2.4 Drill machine 2.5 Hammer drill machine 2.6 Hacksaw 2.7 Spirit level 2.8 Shovel 2.9 trowel 2.10 Angle grinder 2.11 Steel wire brush 2.12 Oil can 2.13 Pipe cutter 2.14 Pipe wrench 2.15 Reamer 2.16 Adjustable wrench 2.17 Thread gauge 2.18 Air compressor
3. Sizes of pipe	3.1. 12 mm dia. 3.2. 16 mm dia. 3.3. 25 mm dia. 3.4. 32 mm dia. 3.5. 40 mm dia. 3.6. 50 mm dia.
4. Pipes	4.1 GI 4.2 uPVC thread pipe 4.3 PPR 4.4 CPVC
5. Materials	5.1 Cement 5.2 Sand 5.3 Brick chips 5.4 Grinding disk 5.5 Teflon tape 5.6 Solvent cement 5.7 Cotton waste 5.8 Marker/Chalk

	5.9 Cutting oil 5.10 Hammer chisel
6. Fittings	6.1 Socket 6.2 Elbow 6.3 Union 6.4 Reducer 6.5 Tee 6.6 Bend 6.7 Nipple 6.8 Union (male and female) 6.9 Elbow (male and female) 6.10 Conceal stop cock 6.11 Ball valve/gate valve 6.12 Angle stop cock 6.13 Wall Shower 6.14 Hand shower 6.15 Ceiling shower 6.16 Push shower 6.17 Concealed bib cock 6.18 Open bib cock
7. Joints	7.1 Cross 7.2 Union 7.3 Tee 7.4 Elbow 7.5 Bend 7.6 Socket
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. performed thread cutting as per standard procedure 1.2. checked thread and adjusted as required. 1.3. laid down pipes for joining fittings 1.4. joined pipes with fittings 1.5. taken measurements are as per requirements 1.6. performed leak test following standard procedure 1.7. cleaned workplace as per standard procedure
2. Underpinning Knowledge	2.1. Measurements (linear and angular) 2.2. Fittings 2.3. Types of Pipes. 2.4. Water supply line 2.8. Safety precautions in cutting walls

	2.9. Jamming procedure 2.10. Uses of grinding disk 2.11. Sizes of pipe 2.12. Materials used for joining 2.13. Joints
3. Underpinning Skills	3.1 Interpreting drawing. 3.2 Preparing materials. 3.3 Cutting thread 3.4 Checking thread 3.5 Laying down pipes for joining fittings 3.6 Apply the techniques to join pipes with fittings 3.7 Performing leak test
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 follow Instruction 4.6 Tidiness and timeliness 4.7 Respect for rights of peers and seniors in workplace 4.8 Communication with peers, sub-ordinates and seniors in workplace.
5. Resource implications	The following resources must be provided: 5.1. Adequate Workplace 5.2. Tools and equipment required for work activities 5.3. Materials relevant to work activity 5.4. Drawing and specifications relevant to the task.
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 a training center or in an actual or simulated workplace after completion of the training module. 7.2 Assessment should be done by an NSDA certified/ nominated assessor

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References:

a. Competency Standard on plumbing of BTEB
b. Competency Standard on plumbing of NSDA

Development of Competency Standard

The Competency Standards for National Skills Certificate in **Plumbing, Level - 01** qualification is developed by NSDA on 27 November, 2024.

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

The Competency Standards for National Skills Certificate in **Plumbing, Level-1**, Standard is validated by SCVC on 22 December, 2024.

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