



# COMPETENCY STANDARD

## Plumbing

Level: 03

(Construction Sector)

Competency Standard Code: CS-CON-PLMB-L3-EN-V1



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



## Copyright

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This document has been reviewed 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 under Bangladesh National Qualification Framework (BNQF) and will be listed on the NSDA's online portal.

This competency standard is reviewed to improve skills and knowledge in accordance with the job roles, duties and tasks of the occupation and ensure that the required skills and knowledge are aligned to industry requirements. A series of stakeholder consultations, workshops were held to develop this document.

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

## Overview

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

The purpose of a competency standards is to:

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

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

Competency standards describe the skills, knowledge and attitude needed to perform effectively in the workplace. CS acknowledge that people can achieve technical and vocational competency in many ways by emphasizing what the learner can do, not how or where they learned to do it.

With competency standards, training and assessment may be conducted at the workplace or at training institute or any combination of these.

Competency standards consist of a number of units of competency. A unit of competency describes a distinct work activity that would normally be undertaken by one person in accordance with industry standards.

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

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

Together, all the parts of a unit of competency:

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

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

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

## Competency Standards for National Skill Certificate – 3 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
SCVC	-	Standards and Curriculum Validation Committee
STP	-	Skills Training Provider
SOP	-	Standard Operating Procedure
UoC	-	Unit of Competency

Approved by  
41<sup>st</sup> Authority Meeting of NSDA  
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## National Competency Standards for National Skill Certificate in Plumbing, Level 3 in Construction Sector

### Course Structure

SL	Unit Code and Title		UoC Level	Nominal Hours
Generic Units of Competencies				40
1.	GU-02-L3-V1	Practice Negotiation Skill	3	20
2.	GU-04-L3-V1	Lead a Small Team	3	20
Occupation Specific Units of Competencies				280
3.	OU-CON-PLMB-01-L3-V2	Perform Installation of Advance Plumbing Fittings	3	40
4.	OU-CON-PLMB-02-L3-V2	Perform Installation of Advance Plumbing Fixtures	3	90
5.	OU-CON-PLMB-03-L3-V2	Perform Installation of Hot and Chilled Water Piping System	3	100
6.	OU-CON-PLMB-04-L3-V2	Maintain and Service Plumbing Works	3	50
Nominal Hours				320
Workplace Visit				20
Total Nominal Hours				340

## Units & Elements at a Glance:

### Generic Competencies (40 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
GU-02-L3-V1	Practice Negotiation Skill	1. Plan negotiations 2. Participate in negotiations	20
GU-04-L3-V1	Lead a Small Team	1. Provide team leadership 2. Assign responsibilities 3. Set performance expectations for team members 4. Supervise team performance	20
<b>Total Hours</b>			<b>40</b>

### Occupation Specific Competencies (280 Hours)

Code	Unit of Competency	Elements of Competency	Duration (Hours)
OU-CON-PLMB-01-L3-V1	Perform Installation of Advance Plumbing Fittings	1. Prepare for works 2. Install diverter valve set 3. Install water meter 4. Install non-return valve 5. Install pressure valve 6. Maintain workplace, tools, equipment and materials	40
OU-CON-PLMB-02-L3-V1	Perform Installation of Advance Plumbing Fixtures	1. Prepare for works 2. Install bath tub 3. Install jacuzzi bath tub 4. Maintain workplace, tools, equipment and materials	90
OU-CON-PLMB-03-L3-V1	Perform Installation of Hot and Chilled Water Piping System	1. Prepare for works 2. Install electric geyser with service line 3. Install supply line from reserve tank to overhead tank 4. Install overhead tank to supply line 5. Maintain workplace, tools, equipment and materials	100

OU-CON-PLMB-04-L3-V1	Maintain and Service Plumbing Works	<ol style="list-style-type: none"> <li>1. Prepare for work</li> <li>2. Maintain and service of pipe fittings and fixtures</li> <li>3. Remove blockage form pipe line</li> <li>4. Repair water leakage of pipe line</li> <li>5. Repair flushing cistern for commode</li> <li>6. Maintain workplace, tools, equipment and materials</li> </ol>	50
<b>Total Hours</b>			<b>280</b>

## **Generic Units of Competencies**

<b>Unit Code and Title</b>	<b>GU-02-L3-V1: Practice Negotiation Skills</b>
<b>Unit Descriptor</b>	This unit covers the knowledge, skills and attitudes required to practice negotiation skills. It specifically includes – planning negotiations and participating in negotiations.
<b>Nominal Hours</b>	<b>20 Hours</b>
<b>Elements of Competency</b>	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables Training Components
1. Plan negotiations	1.1 Information on <b><u>preparing for negotiation</u></b> is identified and included in the plan; 1.2 Information on creating <b><u>non-verbal environments</u></b> for positive negotiating is identified and included in the plan; 1.3 Information on <b><u>active listening</u></b> is identified and included in the plan; 1.4 Information on different <b><u>questioning techniques</u></b> is identified and included in the plan; 1.5 Information is checked to ensure it is correct and up-to-date.
2. Participate in negotiations	1.1 Criteria for successful outcome are agreed upon by all parties. 1.2 Desired outcome of all parties is considered; 1.3 Appropriate language is used throughout the negotiation. 1.4 A variety of questioning techniques are used; 1.5 The issues and processes are documented and agreed upon by all parties; 1.6 Possible solutions are discussed and their viability assessed; 1.7 Areas for agreement are confirmed and recorded; 1.8 Follow-up action is agreed upon by all parties.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (May include but not limited to)</b>
1. Preparing for negotiation	1.1 Background information on other parties to the negotiation 1.2 Good understanding of topic to be negotiated 1.3 Clear understanding of desired outcome/s 1.4 Personal attributes <ul style="list-style-type: none"> <li>▪ Self esteem</li> <li>▪ Self esteem</li> <li>▪ Objectivity</li> <li>▪ Empathy</li> <li>▪ Respect for others</li> </ul> 1.5 Interpersonal skills <ul style="list-style-type: none"> <li>▪ Listening / reflecting</li> </ul>



	<ul style="list-style-type: none"> <li>▪ Non-verbal communication</li> <li>▪ Assertiveness</li> <li>▪ Behavior labeling</li> <li>▪ Testing understanding</li> <li>▪ Seeking information</li> <li>▪ Self-disclosure</li> </ul> <p>1.6 Analytic skills</p> <ul style="list-style-type: none"> <li>▪ Observing differences between content and process</li> <li>▪ Identifying bargaining information</li> <li>▪ Applying strategies to manage process</li> <li>▪ Applying steps in negotiating process</li> <li>▪ Strategies to manage conflict</li> <li>▪ Steps in negotiating process</li> </ul> <p>1.7 Options within organization and externally for resolving conflict</p>
2. Non-verbal environments	<p>2.1 Friendly reception</p> <p>2.2 Warm and welcoming room</p> <p>2.3 Refreshments offered</p> <p>2.4 Lead in conversation before negotiation begins</p>
3. Active listening	<p>3.1 Attentive</p> <p>3.2 Don't interrupt</p> <p>3.3 Good posture</p> <p>3.4 Maintain eye contact</p> <p>3.5 Reflective listening</p>
4. Questioning techniques	<p>4.1 Direct</p> <p>4.2 Indirect</p> <p>4.3 Human Open-ended</p>
<b>Evidence Guide</b> 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 evidences that the candidate:</p> <p>1.1 demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome.</p> <p>1.2 participated in negotiation with at least one person to achieve an agreed outcome.</p>
2. Underpinning knowledge	<p>2.1 Codes of practice and guidelines for the organization.</p> <p>2.2 Organization policy and procedures for negotiations.</p> <p>2.3 Decision making and conflict resolution strategies procedures.</p> <p>2.4 Problem solving strategies on how to deal with unexpected questions and attitudes during negotiation.</p> <p>2.5 Flexibility.</p> <p>2.6 Empathy.</p>

3. Underpinning skill	3.1 Interpersonal skills to develop rapport with other parties. 3.2 Communication skills (verbal and listening). 3.3 Observation skills. 3.4 Negotiation skills.
4. Required 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 implication	The following resources MUST be provided: 5.1 workplace (actual or simulated). 5.2 human resources (negotiators).
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 work place after Completion of the training module; 7.2 Assessment should be done by NSDA certified assessor
<b>Accreditation Requirements</b> 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-04-L3-V1: Lead Small Team
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to lead small team.</p> <p>It specifically includes providing team leadership, assigning responsibilities, setting performance expectations for team members and supervising team performance.</p>
Nominal Hours	20 Hours
Elements of Competency	<p><b>Performance Criteria</b>  <b>Bold &amp; Underlined</b> terms are elaborated in the Range of Variables</p>
1. Provide team leadership	<p>1.1 <b><u>Work requirements</u></b> are identified and presented to team members;</p> <p>1.2 Reasons for instructions and requirements are communicated to team members;</p> <p>1.3 <b><u>Team members' queries and concerns</u></b> are recognized, discussed and dealt with.</p>
2. Assign responsibilities	<p>2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and attitudes required to properly undertake the assigned task;</p> <p>2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible.</p>
3. Set performance expectations for team members	<p>3.1 Performance expectations are established based on client needs and according to assignment requirements;</p> <p>3.2 Performance expectations are based on individual team members' duties and area of responsibility;</p> <p>3.3 Performance expectations are discussed and directed to implement in the workplace.</p>
4. Supervise team performance	<p>4.1 <b><u>Monitoring of performance</u></b> are taken place against defined performance criteria and / or assignment instructions and corrective action taken if required;</p> <p>4.2 Team members are provided <b><u>feedback</u></b>, positive support and advice on strategies to overcome any deficiencies;</p> <p>4.3 <b><u>Performance issues</u></b> which cannot be rectified or addressed within the team are referenced to appropriate personnel;</p> <p>4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on clients' / customers' needs and satisfaction;</p> <p>4.5 Team operations are monitored to ensure that employer / client needs and requirements are met;</p> <p>4.6 Follow-up communication is provided on all issues affecting the team;</p> <p>4.7 All relevant documentation is completed.</p>

<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (may include but are not limited to):</b>
1. Work requirements	1.1 Client Profile 1.2 Assignment instructions
2. Team member's queries and concerns	2.1 Roster 2.2 Shift details
3. Monitoring of performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1 Formal process 4.2 Informal process 4.3 Sandwich process
5. Performance issues	5.1 Work output 5.2 Work quality 5.3 Team participation 5.4 Compliance with workplace protocols 5.5 Safety 5.6 Customer service
<b>Evidence Guide</b>	
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 maintained or improved individuals and / or team performance given a variety of possible scenario 1.2 assessed and monitored team and individual performance against set criteria 1.3 represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf 1.4 allocated duties and responsibilities, having regard to individual's knowledge, skills and attitude and the needs of the tasks to be performed 1.5 set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members.
2. Underpinning knowledge	2.1 Company policies and procedures 2.2 Relevant legal requirements 2.3 How performance expectations are set 2.4 Methods of Monitoring Performance 2.5 Client expectations 2.6 Team members' duties and responsibilities
3. Underpinning skills	3.1 Informal performance counselling skills 3.2 Team building skills 3.3 Negotiating skills

4. Required 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 Communicate with peers and seniors in workplace.
5. Resource implications	The following resources must be provided: 5.1 Workplace (actual or simulated) 5.2 Tools, equipment and facilities appropriate to processes or activity 5.3 Materials relevant to the proposed activity 5.4 Equipment and outfits appropriate in applying safety measures 5.5 Relevant drawings, manuals, codes, standards and reference material.
6. Assessment methods	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 centre or in an actual or simulated workplace after completion of the training module; 7.2 Assessment should be done by NSDA certified assessor.
<b>Accreditation Requirements</b> Training Providers must be accredited by National Skills Development Authority (NSDA), the National Quality Assurance Body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of qualification under BNQF. Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by NSDA.	

## **Occupation Specific Units of Competencies**

<b>Unit Code and Title</b>	<b>OU-CON-PLMB-01-L3-V1: Perform Installation of Advanced Plumbing Fittings</b>
<b>Unit Descriptor</b>	<p>This unit covers the knowledge, skills and attitudes required to perform installation of advanced plumbing fittings.</p> <p>It includes preparing for works, installing diverter valve, water meter, non-return valve, installing pressure valve and maintaining workplace, tools, equipment and materials.</p>
<b>Nominal Hours</b>	<b>40 Hours</b>
<b>Elements of Competency</b>	<p><b>Performance Criteria</b>  <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables</p>
1. Prepare for works	<p>1.1 <b><u>Safety practices</u></b> are followed throughout the work procedure;</p> <p>1.2 <b><u>Personal Protective Equipment (PPE)</u></b> is used;</p> <p>1.3 Workplace is prepared as per job requirement;</p> <p>1.4 <b><u>Tools and equipment</u></b> and <b><u>materials</u></b> are selected and collected as per job requirement.</p>
2. Install diverter valve set	<p>2.1 Location is selected for installing diverter valve;</p> <p>2.2 Teflon tape is spired clockwise (opposite to threading direction) on the diverter valve &amp; supply line pipe threading area;</p> <p>2.3 Nipple is joined with water supply line firmly;</p> <p>2.4 Diverter valve is fitted with nipple and tighten as per direction using pipe wrench and adjustable wrench as per water supply position;</p> <p>2.5 Diverter valve set is checked using water.</p>
3. Install water meter	<p>3.1 Area/location is selected for installing water meter;</p> <p>3.2 Pipes are cut as per specification using pipe cutter;</p> <p>3.3 External threads of both pipes are cut as per specification using die stock;</p> <p>3.4 Threading areas are cleaned using steel ware brush;</p> <p>3.5 Threads are checked as per TPI chart;</p> <p>3.6 Teflon tape is spired clockwise (opposite to threading direction) on external threaded of pipes and meter;</p> <p>3.7 Two unions are fixed with water meter in both sides;</p> <p>3.8 Water meter is connected with both pipes following water direction;</p> <p>3.9 <b><u>Fittings</u></b> are tighten firmly using pipe wrench and adjustable wrench;</p> <p>3.10 Leakage and meter are checked using water supply.</p>

4. Install non-return valve	<p>4.1 Area/location is selected for installing non-return valve;</p> <p>4.2 Pipe is cut as per specification using pipe cutter;</p> <p>4.3 External thread is cut as per specification using die stock;</p> <p>4.4 Threading area is cleaned and checked;</p> <p>4.5 Teflon tape is spired clockwise (opposite to threading direction) on the external threaded of pipe;</p> <p>4.6 Non-return valve is connected with pipe following water direction;</p> <p>4.7 Fittings are tighten firmly using pipe wrench and adjustable spanner;</p> <p>4.8 Leakage is checked using water supply.</p>
5. Install pressure valve	<p>5.1 Area/location is selected for installing pressure valve;</p> <p>5.2 Pipes are cut as per specification using Pipe cutter;</p> <p>5.3 External threads of both pipes are cut as per specification using die stock;</p> <p>5.4 Threading areas are cleaned using steel wire brush;</p> <p>5.5 Threading areas are checked as per thread cutting;</p> <p>5.6 Teflon tape is spired clockwise (opposite to threading direction) on the external threaded of pipes.</p> <p>5.7 Pressure valve is connected with pipes following water direction arrow is pointing downstream;</p> <p>5.8 Fittings are tighten using pipe wrench and adjustable spanner;</p> <p>5.9 Leakage and pressure are checked using water supply and pressure meter.</p>
6. Maintain workplace, tools, equipment and materials	<p>4.1 Work area is cleaned in accordance with workplace procedures.</p> <p>4.2 Unused materials are stored for re-use;</p> <p>4.3 Waste and scrap materials are disposed following as per workplace procedure;</p> <p>4.4 Inventory of tools equipment are conducted and recorded as per checklist;</p> <p>4.5 Tools and equipment are cleaned and stored in appropriate location.</p>
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (may include but not limited to):</b>
1. Safety practices	<p>1.1 Identify hazards</p> <p>1.2 Control hazards</p> <p>1.3 Measure risk</p> <p>1.4 Response emergency situation</p> <p>1.5 Apply first Aid</p> <p>1.6 Participate in OSH training</p> <p>1.7 Report to the designated authority regarding hazards safety and risk issues.</p>



2. Personal Protective Equipment (PPE)	2.1 Helmet (following color code) 2.2 Goggles 2.3 Mask 2.4 Apron 2.5 Hand gloves 2.6 Safety belt 2.7 Safety shoes
3. Tools and equipment	3.1 Measuring tape 3.2 Spirit level 3.3 Hack saw frame with blade 3.4 Chisel 3.5 Ball pin hammer 3.6 Screw driver 3.7 Centre punch 3.8 Pipe reamer 3.9 Pencil 3.10 Pipe wrench 3.11 Adjustable spanner 3.12 Combination pliers 3.13 Plumb bob 3.14 Try square 3.15 Pipe cutter 3.16 CPVC pipe cutter 3.17 Diestock 3.18 Steel ware brush 3.19 Paint brush 3.20 Oil cane 3.21 Pipe vice 3.22 Grip vice 3.23 Water pressure meter 3.24 File 3.25 Mallet hammer 3.26
4. Materials	4.1 GI pipe 4.2 PVC pipe 4.3 UPVC / CPVC pipe 4.4 Teflon tap 4.5 Solvent cement 4.6 Enamel paint 4.7 Oil 4.8 Thread

5. Fittings	4.1 Socket 4.2 Elbow 4.3 Bend 4.4 Gate valve 4.5 Pressure valve/Safety valve 4.6 Ball valve 4.7 Globe valve 4.8 Divert valve 4.9 Water meter 4.10 Non return valve 4.11 Reducer 4.12 Nipple 4.13 Bush 4.14 Union 4.15 Plug 4.16 End cap 4.17 Crossover bend
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspect of competency	Assessment required evidences that the candidate: 1.1 read and interpreted work instructions; 1.2 selected materials, tools, and equipment with job requirement; 1.3 installed pipes and fittings with a standard slope/ gradient in accordance of Bangladesh National Building Code; 1.4 prepared pipes and joints in accordance with the job requirements / specification's; 1.5 install water meter at least 30cm from ground/floor level; 1.6 communicated interactively with others for safe and effective work operations; 1.7 determined location and piping lay-out of the working plan; 1.8 consulted with plumbing designer about piping.
2. Underpinning knowledge	2.1 Specification of materials 2.2 Use of materials 2.3 Use of tools and equipment 2.4 Plumbing processes. 2.5 Plumbing layout. 2.6 Plumbing pipes and fittings. 2.7 Plumbing fixtures. 2.8 Different types of valves and their uses 2.9 Positioning of valve and meter.

	2.10 Installation process of pipes and fittings
3. Underpinning skills	3.1 Identifying and interpreting technical drawing. 3.2 Cutting pipe. 3.3 Fixing joints. 3.4 Installing fixture 3.5 Fitting Valve. 3.6 Connecting Water meter 3.7 Performing Alignment. 3.8 Cleaning Site
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implication	The following resources must be available: 5.1 workplace (actual or simulated) 5.2 appropriate Layout instrument 5.3 materials relevant to the proposed activity 5.4 drawings and specifications relevant to the task.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated work place after completion of the training module. 7.2 Assessment should be done by NSDA certified assessor.

### **Accreditation Requirements**

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Unit Code and Title	<b>OU-CON-PLMB-02-L3-V1: Perform Installation of Advanced Plumbing Fixtures</b>
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to perform installation of advanced plumbing fixtures.</p> <p>It includes preparing for works, installing bath tub and jacuzzi bath tub and maintaining workplace, tools equipment and materials.</p>
Nominal Hours	<b>90 Hours</b>
Elements of Competency	<p><b>Performance Criteria</b>  <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables</p>
1. Prepare for works	<p>1.1 <b><u>Safe practices</u></b> are followed throughout the work process;</p> <p>1.2 <b><u>Personal Protective Equipment (PPE)</u></b> is collected and worn.</p> <p>1.3 Workplace is prepared as per job requirement;</p> <p>1.4 <b><u>Tools and equipment</u></b> and <b><u>materials</u></b> are selected and collected as per job requirement.</p>
2. Install bath tub	<p>2.1 Bath tub location is identified as per specific measurement and layout plan;</p> <p>2.2 Piping lay-out is workout as per drawing plan;</p> <p>2.3 Bath tab is installed into casting with leveling as per drawing;</p> <p>2.4 Waste and overflow pipes are fixed with bathtub and drainage system using fittings as standard joint procedure;</p> <p>2.5 Bath tab is covered by brick wall to fill up gap;</p> <p>2.6 <b><u>Fixtures</u></b> are fixed in bathtub area as per drawing;</p> <p>2.7 Bath tub fixtures are installed following standard height;</p> <p>2.8 Bath tub level is checked using <b><u>checking instrument</u></b> ;</p> <p>2.9 Leakage and gaps are checked using water supply.</p>
3. Install jacuzzi bath tub	<p>3.1 Jacuzzi bath tub location is identified as per specific measurement and layout plan;</p> <p>3.2 Jacuzzi is fixed into the marked area with leveling;</p> <p>3.3 Fittings and fixtures are connected with Jacuzzi by following specification;</p> <p>3.4 Waste and overflow pipes are fixed with jacuzzi and drainage system using fittings as standard joint procedure;</p> <p>3.5 Electric motor is assembled with water supply line and Jacuzzi as a result of ensured safety electric connection;</p> <p>3.6 Power supply line is connected with the power source;</p> <p>3.7 Performance of Jacuzzi bath tub is checked supplying electric power;</p> <p>3.8 Jacuzzi bath tub level and leakage is checked following standard procedure.</p>

4. Maintain workplace, tools, equipment and materials	4.1 Work area is cleaned in accordance with workplace procedures; 4.2 Unused materials are stored for re-use; 4.3 Waste and scrap materials are disposed following as per workplace procedure; 4.4 Inventory of tools equipment are conducted and recorded as per checklist; 4.5 Tools and equipment are cleaned and stored in appropriate location.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (may include but not limited to):</b>
1. Safe work practices	1.1 Identify hazards 1.2 Control hazards 1.3 Report to the designated authority regarding Ciber hazards and risk. 1.4 Response to the emergency situation 1.5 Use fire extinguisher 1.6 Conduct hazard inspection in the workplace 1.7 Assess and measure risk
2. Personal Protective Equipment (PPE)	2.1 Dust mask 2.2 Goggles 2.3 Safety shoes 2.4 Apron 2.5 Hand Gloves 2.6 Ear muff 2.7 Safety Helmet (following color code)
3. Tools and equipment	3.1 Measuring tape 3.2 Marking chalk 3.3 Hacksaw with blade 3.4 File 3.5 Adjustable wrench 3.6 Hammer (ball pin, chipping and wooden) 3.7 Pipe wrench 3.8 Pipe cutter 3.9 Reset die stock 3.10 Fixed die stock

	3.11 Steel wire brush 3.12 Cleaning brush 3.13 Oil cane 3.14 Combination pliers 3.15 Steel trowel / Kurni 3.16 Masonry pan (korai) 3.17 Bucket 3.18 Shovel (belcha) 3.19 Cold chisel 3.20 Broom strict 3.21 PPR Welding machine 3.22 Hydraulic Pressure machine 3.23 Hand Grinding machine 3.24 Hand Drill machine 3.25 Power chisel 3.26 Monkey wrench/Grip pliers 3.27 Spanner set
4. Materials	4.1 Bend 4.2 Socket 4.3 Nipple 4.4 Tee 4.5 Plug 4.6 Union 4.7 Bush 4.8 Elbow 4.9 Thread tape 4.10 Cement 4.11 Sand 4.12 Brick chips 4.13 White cement 4.14 Brick 4.15 Solvent cement 4.16 Screws 4.17 Royal plug 4.18 Bathtub waste 4.19 Bathtub waste pipe 4.20 Bathtub overflow set

5. Fixtures	5.1 Bathtub 5.2 Shower 5.3 Bathtub mixer 5.4 Hand shower 5.5 Bathtub waste 5.6 Jacuzzi 5.7 Electric light 5.8 Water / Electric pump
6. Checking instrument	6.1 Sprit level 6.2 Water level 6.3 Laser leveling 6.4 Water pressure gauge
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	
1. Critical aspect of competency	Assessment required evidences that the candidate: 1.1 selected and collected tools and equipment according to job requirement; 1.2 specified and selected size of pipes which is requirement to install bath tub; 1.3 cut and worked out the cut pieces of pipe according to specification and measurement as following safety; 1.4 performed threading of pipes according to fitting and join between two pipes; 1.5 fitted–up joint and fittings according to job requirements; 1.6 installed fixtures with a standard rule according to Bangladesh National Building Code; 1.7 performed brick-wall around the bath tub.
2. Underpinning knowledge	2.1 Uses of tools, equipment and materials. 2.2 Measurement of the bath tub, install area. 2.3 Types of thread and measurement of thread. 2.4 Functions of sensor in advance fittings and fixtures 2.5 Function, description, uses and specification of materials, fittings and fixtures. 2.6 Function and uses of layout plan and drawing 2.7 Plumbing processes. 2.8 Mortar Ratio to use of material, fittings, fixtures, pipes. 2.9 Procedure of installing with leakage proof connection 2.10 Installation procedure of jacuzzi bath tub 2.11 Laying procedure of brick

3. Underpinning skills	3.1 Cutting pipe following measurement 3.2 Threading pipe pieces accordingly following measurement. 3.3 Interpreting drawings and plans 3.4 Identifying the marking area to install bath tub. 3.5 Setting bath tub into casing. 3.6 Making brick wall besides of bath tub. 3.7 Installing Jacuzzi and electrical motor. 3.8 Installing bath tub. 3.9 Rechecking installation process.
4. Required attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implication	The following resources must be available: 5.1 workplace (actual or simulated) 5.2 relevant tools and equipment 5.3 materials relevant to the proposed activity 5.4 drawings and specifications relevant to the task.
6. Methods of assessment	Methods of assessment may include but not limited to: 6.1 written test 6.2 demonstration 6.3 oral questioning 6.4 portfolio.
7. Context of assessment	7.1 Competency assessment must be done in a training center or in an actual or simulated work place after completion of the training module; 7.2 Assessment should be done by NSDA certified assessor.

### **Accreditation Requirements**

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Unit Code and Title	OU-CON-PLMB-03-L3-V1: Perform Installation of Hot and Chilled Water Piping System
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to perform installation of hot and chilled water piping system.</p> <p>It includes preparing for works, installing electric geyser with service line and supply line from reserve tank to overhead tank, performing pipe bending by the pipe bending machine, installing overhead tank to supply line, installing pipe lines on the wall surface and maintaining workplace, tools, equipment and equipment.</p>
Nominal Hours	100 Hours
Elements of Competency	<b>Performance Criteria</b> <b><u>Bold &amp; Underlined</u></b> terms are elaborated in the Range of Variables
1. Prepare for works	1.1 <b><u>Safe work practices</u></b> are observed throughout the work procedure; 1.2 <b><u>Personal Protective Equipment (PPE)</u></b> is used; 1.3 Workplace is prepared as per job requirement; 1.4 <b><u>Tools and equipment</u></b> and <b><u>materials</u></b> are selected and collected as per job requirement.
2. Install electric geyser with service line	2.1 Installation area/location is marked as per measurement of geyser; 2.2 Wall is drilled as per geyser measurement and set screw using drilling machine and screwdriver; 2.3 Electric geyser is fixed on bath false slab top; 2.4 Hot and cold potable pipes and fittings are connected; 2.5 <b><u>valves</u></b> are fixed with hot and chilled water line; 2.6 Power supply is connected with geyser; 2.7 Leakage is tested and checked with water supply line.
3. Install supply line from reserve tank to overhead tank	3.1 Installation area/location is marked as per measurement and layout; 3.2 Pipes are fixed as per drawing layout; 3.3 <b><u>Pump</u></b> is connected with vertical delivery pipe; 3.4 Reserve tank is connected with overhead tank; 3.5 Overhead tank to overflow out line is performed as per work requirement; 3.6 Drainage pipe is fitted with overhead tank for passing the waste water; 3.7 Leakage is tested and checked as per workplace procedure.

4. Install overhead tank to supply line	4.1 Overhead tank is marked as per drawing plan; 4.2 Booster pump is connected with service line; 4.3 Overhead tank is connected with service line; 4.4 Air pipe is connected with service line in overhead tank; 4.5 Overflow line is connected with overhead tank.
5. Maintain workplace, tools, equipment and materials	5.1 Work area is cleaned in accordance with workplace procedures; 5.2 Unused materials are stored for re-use or disposed following workplace procedures; 5.3 Waste and scrap materials are disposed with following workplace procedures; 5.4 Inventory of tools equipment are conducted and recorded as per checklist; 5.5 Tools and equipment are cleaned and stored as per manufacturer's recommendation in appropriate location.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range</b> (may include but not limited to):
1. Safe work practices	1.1 Identify hazards 1.2 Control hazards 1.3 Report to the designated authority regarding hazards and risk. 1.4 Response to the emergency situation 1.5 Use fire extinguisher 1.6 Conduct hazard inspection in the workplace 1.7 Assess and measure risk
2. Personal Protective Equipment (PPE)	2.1 Helmet (Following color code) 2.2 Goggles 2.3 Mask 2.4 Apron 2.5 Hand gloves 2.6 Safety belt 2.7 Harness 2.8 Safety shoes

3. Tools and equipment	3.1 Measurement tape 3.2 Spirit level 3.3 Hack saw frame with blade 3.4 Chisel 3.5 Ball pin hammer 3.6 Hand drill machine 3.7 Screw driver 3.8 Central punch 3.9 Pipe reamer 3.10 Marking tools 3.11 Pipe wrench 3.12 Adjustable wrench 3.13 Combination pliers 3.14 Grinding machine 3.15 Trowel 3.16 Plumb bob 3.17 Aluminum floating rule 3.18 Wooden float 3.19 Try square 3.20 Pan 3.21 Shovel 3.22 Bucket 3.23 Brick hammer
4. Materials	4.1 Sand 4.2 Cement 4.3 Pie chips 4.4 Diamond disc 4.5 GI pipe 4.6 PVC thread pipe 4.7 PPR pipe 4.8 CPVC pipe
5. Valves	5.1 Gate Valve 5.2 Ball Valve 5.3 Safety Valve 5.4 Pressure reduce Valve 5.5 Non return Valve 5.6 Foot Valve
6. Pump	6.1 Centrifugal Pump 6.2 Booster Pump
<b>Evidence Guide</b> The evidence must be authentic, valid, sufficient, reliable, consistent, recent and meet all requirements of current version of the Unit of Competency.	

1. Critical aspect of competency	<p>Assessment required evidences that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 read and interpreted work instructions;</li> <li>1.2 selected materials, tools, and equipment with job requirement;</li> <li>1.3 installed pipes and fittings with a standard slope/ gradient in accordance of Bangladesh National Building Code;</li> <li>1.4 prepared pipes and joints in accordance with the job requirements / specification's;</li> <li>1.5 communicated interactively with others for safe and effective work operations;</li> <li>1.6 determined location and piping lay-out of the working plan.</li> </ul>
2. Underpinning knowledge	<ul style="list-style-type: none"> <li>2.1 Use of Materials</li> <li>2.2 Material specification.</li> <li>2.3 Use of tools and equipment</li> <li>2.4 Safety precaution of using electric geyser.</li> <li>2.5 Installation process of electric geyser</li> <li>2.6 Plumbing processes.</li> <li>2.7 Plumbing layout.</li> <li>2.8 Plumbing pipes and fittings.</li> <li>2.9 Plumbing Valves</li> <li>2.10 Mortar mixing ratio.</li> </ul>
3. Underpinning skills	<ul style="list-style-type: none"> <li>3.1 Cutting pipe.</li> <li>3.2 Fixing joints.</li> <li>3.3 Installing fixture and Valve .</li> <li>3.4 Interpreting drawing</li> <li>3.5 Applying piping techniques of overhead</li> <li>3.6 Performing alignment.</li> <li>3.7 Mortar mixing.</li> <li>3.8 Pressure testing pressure.</li> <li>3.9 Setting pipe.</li> <li>3.10 Setting pump.</li> </ul>
4. Required attitudes	<ul style="list-style-type: none"> <li>4.1 Commitment to occupational safety and health.</li> <li>4.2 Promptness in carrying out activities.</li> <li>4.3 Sincere and honest to duties.</li> <li>4.4 Eagerness to learn.</li> <li>4.5 Tidiness and timeliness.</li> <li>4.6 Environmental concerns.</li> <li>4.7 Respect for rights of peers and seniors at workplace.</li> <li>4.8 Communicate with peers and seniors at workplace.</li> </ul>

5. Resource implication	<p>The following resources must be available:</p> <p>5.1 workplace (actual or simulated)</p> <p>5.2 Tools and equipment relevant to the proposed activity</p> <p>5.3 materials relevant to the proposed activity</p> <p>5.4 drawings and specifications relevant to the task.</p>
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 a training center or in an actual or simulated work place after completion of the training module.</p> <p>7.2 Assessment should be done by NSDA certified assessor.</p>

#### **Accreditation Requirements**

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Unit Code and Title	OU-CON-PLMB-04-L3-V1: Maintain and Service Plumbing Works
Unit Descriptor	<p>This unit covers the knowledge, skills and attitudes required to maintain and service plumbing works.</p> <p>It includes preparing for work, selecting and collecting tools, equipment and materials, maintaining and service of pipe fittings and fixtures, clearing clogged pipes and drains and maintaining workplace cleanliness and storing tools.</p>
Nominal Hours	50 Hours
Elements of Competency	<b>Performance Criteria</b> <u><b>Bold and Underlined</b></u> terms are elaborated in the Range of Variables.
1. Prepare for work	1.1 <u><b>Personal Protective Equipment (PPE)</b></u> is collected and worn as per requirement; 1.2 <u><b>Safe work practices</b></u> are observed throughout the work procedure; 1.3 <u><b>Maintenance and service</b></u> requirements are identified as per job requirement; 1.4 <u><b>Tools, equipment</b></u> and <u><b>materials</b></u> are selected and collected.
2. Maintain and service of pipe fittings and fixtures	2.1 Defective <u><b>pipes</b></u> , <u><b>fittings</b></u> and fixtures are identified, disconnected and serviced as required; 2.2 Defective pipes, fittings and fixtures are replaced as per requirements; 2.3 Replacements are checked for functionality; 2.4 Joints are secured and leak proofing is performed; 2.5 Damaged areas are repaired as required; 2.6 Correct function of fittings and fixtures are observed.
3. Remove blockage from pipe line	3.1 Blockage area of pipe line is identified; 3.2 Main supply valve of water pipeline is closed to protect water flow; 3.3 Fittings are removed from the main pipe line using pipe wrench; 3.4 <u><b>Compressor machine</b></u> is connected with main pipe line; 3.5 Gate valve is opened to remove blockage; 3.6 Blockage is removed using compressor machine; 3.7 <u><b>Bib cock</b></u> is opened and removed rust, blockage, debris to free water flow; 3.8 Fitting are fixed with main pipe line using pipe wrench as per requirement; 3.9 Leakage is rechecked with service line using water supply.

4. Repair water leakage of pipe line	4.1 Leakage is identified of the pipe line; 4.2 Main supply valve of water pipeline is closed to protect water flow; 4.3 Wall or floor besides of leakage pipe line area is removed and cut using chisel; 4.4 Leak / damage pipe are cut as required and removed from pipe line; 4.5 Pipe is replaced following same specification; 4.6 Primer socket/union is assembled with pipe and socket as standard assembling; 4.7 Solvent cement is applied around on uPVC socket as per requirement; 4.8 Leakage is rechecked with service line using water supply; 4.9 Cut area is covered with plastering as per standard ratio.
5. Repair flushing cistern for commode	5.1 Main valve of water pipeline is closed to stop flow of water; 5.2 Flush pipe and connection pipe is disconnected from commode; 5.3 Commode is removed from trap; 5.4 Flushing cistern is repaired for commode; 5.5 Commode is fixed with trap following safety procedure; 5.6 Leakage test is conducted with service line using water supply.
6. Maintain workplace, tools, equipment and materials	6.1 Work area is cleaned in accordance with workplace procedures. 6.2 Unused materials are stored for re-use; 6.3 Waste and scrap materials are disposed following as per workplace procedure; 6.4 Inventory of tools equipment are conducted and recorded as per checklist; 6.5 Tools and equipment are cleaned and stored in appropriate location.
<b>Range of Variables</b>	
<b>Variable</b>	<b>Range (may include but not limited to):</b>
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
2. Safe work practices	2.1 Identify hazards 2.2 Control hazards 2.3 Report to the designated authority regarding hazards and risk. 2.4 Response to the emergency situation 2.5 Use fire extinguisher 2.6 Conduct hazard inspection in the workplace

	2.7 Assess and measure risk
3. Maintenance and service	2.1 Valves 2.2 Pipe joints 2.3 Accessories 2.4 Basin 2.5 Sink 2.6 Shower 2.7 Faucets 2.8 Commode 2.9 Backflow
4. Tools	3.1 Ball pein Hammer 3.2 Pipe wrench 3.3 Adjustable Wrench 3.4 Monkey wrench 3.5 Cold chisel 3.6 Claw hammer 3.7 Hacksaw 3.8 Pushcart 3.9 Spirit level 3.10 Shovel 3.11 Pointing trowel 3.12 Push pull rule 3.13 Cold chisel 3.14 Trowel
5. Equipment	4.1 PPR Welding machine 4.2 Pressure machine 4.3 Angle Grinding machine 4.4 Hand Drill machine 4.5 Core Cutter
6. Materials	5.1 Cement 5.2 Sand 5.3 Bricks 5.4 Brick/stone chips
7. Pipes	6.1 GI pipe 6.2 PVC Pipe 6.3 uPVC Thread Pipe 6.4 PPR Pipe 6.5 CPVC Pipe 6.6 uPVC Non thread pipe
8. Fittings	7.1 Socket 7.2 Elbow 7.3 Union 7.4 Reducer 7.5 Tee



	7.6 Bend 7.7 Nipple
9. Compressor machine	8.1 Hydraulic compressor 8.2 Air compressor 8.3 Hand pressure machine
10. Bib cock	9.1 Two-in bib cock 9.2 Long bib cock 9.3 Sink cock 9.4 Pillar cock 9.5 Angle stop cock 9.6 Conceal stop cock 9.7 Gas cock
<b>Evidence Guide</b> 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 maintenance and service requirements are as per job requirement; 1.2 Identified, disconnected and serviced defective pipes, fittings and fixtures; 1.3 secured joints and performed leak proofing; 1.4 fixed clogged pipes and drains in line; 1.5 cleared clogged pipes and drains; 1.6 cleaned workplace is as per standard procedure.
2. Underpinning Knowledge	2.1 Types of Maintenance 2.2 Types Servicing 2.3 Backflow prevention system 2.4 Common faults in basin, sink, shower, commode, toilet pan 2.5 Probable solution of faults 2.6 Causes of water leakage 2.7 Water clogging 2.8 Blockage solving procedure 2.9 Causes of faults in faucets 2.10 Extraction procedure of broken fittings 2.11 Use of Equipment 2.12 Use of Fittings 2.13 Types of Compressor machine and their uses
3. Underpinning Skills	3.1 Preparing materials. 3.2 Handling tools and equipment 3.3 Performing basic masonry and cement concrete works. 3.4 Planning for own works. 3.5 Rectifying water leakage 3.6 Removing Water clogging 3.7 Solving Blockage

4. Underpinning attitudes	4.1 Commitment to occupational safety and health. 4.2 Promptness in carrying out activities. 4.3 Sincere and honest to duties. 4.4 Eagerness to learn. 4.5 Tidiness and timeliness. 4.6 Environmental concerns. 4.7 Respect for rights of peers and seniors at workplace. 4.8 Communicate with peers and seniors at workplace.
5. Resource implications	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 NSDA accredited assessment centre 7.2 Assessment should be done by a 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 Standard for National Skills Certificate, Level- 3 in **Plumbing** is developed by NSDA on 16 February, 2025.

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## Validation of Competency Standard

The Competency Standard for National Skills Certificate, Level- 3 in **Plumbing** is Validated by NSDA on 24 February, 2025.

### List of Members of the Validation Workshop:

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