



**Government of the People's Republic of Bangladesh  
Skills Development Project**

# National Competency Standards for Plumbing

Qualification Title: **National Skills Certificate-III Plumbing  
(Construction Sector)**

Qualification Code: **CONPLM020312A**



**Bangladesh Technical Education Board**

July - 2013

**Copyright**

The National Competency Standard for Plumbing (NSC - III) is a referral document for the development of curricula, teaching and learning materials, and assessment tools. It also serves as the base document for providing trainings consistent with existing quality assurance systems.

This document is owned by the Government of the People's Republic of Bangladesh. All Bangladesh national public and private institutions may use the information in without restriction for activities benefitting Bangladesh.

Other interested parties must obtain permission from the owner of this document for reproduction of information in any manner in whole or in part of this Skills Standard, in English or other languages.

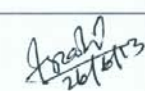
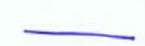
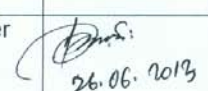

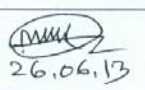
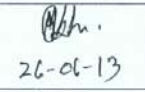
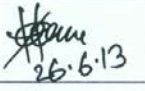
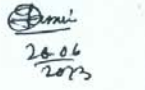
This document is available on a cost recovery basis at:

Bangladesh Technical Education Board (BTEB)  
Agargoan, Sher-E-Bangla Nagar  
Dhaka -1207, Bangladesh  
Telephone: +88 02 81 2056  
Fax: +88 02 8113345  
email: bteb@citech.net  
www.bteb.gov.bd



## Approval Sheet

  
 Bangladesh Technical Education Board  
 Standard Curriculum Development Committee  
 NATIONAL COMPETENCY STANDARDS  
 for  
**Plumbing**  
 ( Pre-voc 2, NTVQF 1,2&3)  
 Meeting held on 26.06.2013

Sl. No	Name of members	Address, Contact number	Designation	Signature	Remarks
1.	Md. Israfil Miah	House#183,Road#12/A, West Dhanmondi, Dhaka-1209 01716275851	Chair Person	 26/6/13	CS Documents Approved
2.	Mr. Abdul Mannan	House#183,Road#12/A, West Dhanmondi, Dhaka-1209 01714494725	Member		
3.	Liton Roy Senior Plumbing Design Engineer	Profile Limited, House#18,Road#06, Gulshan-1, Dhaka 01711281501	Member	 26.06.2013	
4.	Abdul Jalil Engineer	Altasish Construction, Khilgnao, Dhaka. 01712743502	Member		
5.	Mr.Md.Abul Kalam Azad, Project Officer	Directorate of Technical Education,01739440146	Member	 26.06.13	
6.	Mr. Gafur Khan Instructor	Bangladesh-Korea TTC, Darussalam, Mirpur, Dhaka, 01918646390	Member	 26-06-13	
7.	Md. Abdul Hannan Deputy Inspector	Bangladesh Technical Education Board ,Dhaka.01834357971	Member	 26.6.13	
8.	Md. Shamim Farasat Instructor	Montage Training & Certification Bangladesh, Tongi, 142- 143,Miraspara, BISIC EPZ, 01737151691	Member	 26.06 2013	

Developed by: **Shafiqul Alam Bhuiyan**  
Chairman  
On behalf of Construction Industry Skills Council

Under the guidance of: **Chowdury Mufad Ahmed**  
Project Director  
Skills Development Project

Approved by: **Prof. Md. Abul Kashem**  
Chairman  
Bangladesh Technical Education Board



## Preface

The TVET system has a large role to play in economic growth and social development as workforce provider to the labor market and as provider of skills to those who are looking for employment. In the case of Bangladesh, the TVET sector needs major reforms to ensure that issues of quality and capacity, relevance, and access are properly addressed.

The Directorate of Technical Education (DTE) with funding from the Asian Development Bank (ADB), Swiss Agency Development for Cooperation SDC and the Government of Bangladesh (GoB) is implementing a project known as Skills Development Project (SDP). The main target of the Skills Development Project (SDP) is to improve the relevance of TVET in labor market by introducing competency-based training system: a system that proceeds from the development of a qualifications framework, competency standards, curriculum, training delivery, assessment, and quality assurance mechanisms in order to develop a competitive workforce.

The development of competency standards is regarded as the heart of a competency-based training regime. Each standard defines sets of knowledge, skills and attitudes (KSAs) that a Bangladeshi trainee should be able to demonstrate at a recognized level of competence. It provides a common framework of outcomes between the labor and education sectors, as well as among workers, trainers and trainees.

In the process of development, Industry Skills Council (ISC) was organized to determine competencies expected of an occupation in Bangladesh. The ISC, whose membership come from “top performers” in the industry, performed occupational, competency and unit analyses based on their rich experiences in the field, existing documents, and on the advice of national and international experts. Competency standards of Sri Lanka, Philippines, Australia, Korea, Malaysia, Maldives and other countries were examined.

A series of workshops – development, review and finalization - were conducted to ensure a workable National Competency Standards for the occupation. Further, a validation instrument was developed and administered to other top industry performers to verify and confirm the draft being developed.

It is hoped that this document reflects the real needs of the industry thereby providing a concrete basis for the curriculum development and assessment. In such a way, the development of relevant and competent workforce is not farfetched.

**Chowdury Mufad Ahmed**  
Project Director  
Skills Development Project

**Prof. Md. Abul Kashem**  
Chairman, Bangladesh Technical Education Board

## Contents

Copyright .....	1
Approval Sheet.....	2
Preface.....	4
Contents.....	5
Acronyms .....	6
Section 1. The Qualification .....	7
Section 2: National Competency Standards .....	8
Course Structure for National Skills Certificate in Plumber.....	10
Section-3: Generic Competencies .....	11
Demonstrate work values.....	11
Lead small teams.....	18
Practice negotiation skills .....	22
Section 5. The Occupation Specific Competencies .....	26
Perform plumbing Layout.....	26
Perform plumbing fixture installation and assemblies.....	29
Install hot and potable chilled water piping system. ....	34
Perform plumbing system installation and assemblies in multi-storied building (up to 6 storied).....	37
Annexes .....	42
Annex 1. Competency Map for Plumbing in Construction Sector.....	42
Annex 2. Bangladesh National Qualifications Framework.....	43
Annex 3. Qualification Level Descriptors.....	44
Annex 4. Key for Coding.....	45
Acknowledgments.....	46



## Acronyms

MoE	Ministry of Education
DG	Director General
DTE	Directorate of Technical Education
SDP	Skills Development Project
PD	Project Director
PIU	Project Implementation Unit
PLM	Plumber
GOB	Government of Bangladesh
ADB	Asian Development Bank
SC	Swiss contact
ANTA	Australian National Training Authority
APEC	Asia Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
BMET	Bureau of Manpower Employment and Training
NTVQ	National Technical Vocational Qualification
NTVQF	National Technical Vocational Qualification Framework
BTEB	Bangladesh Technical Education Board
CBT	Competency Based Training
CS	Competency Standard
HSC (Voc)	Higher Secondary Certificate (Vocational)
KSA	Knowledge, Skills, Attitude
MoLE	Ministry of Labor and Employment
OHS	Occupational Health and Safety
PSC	Project Steering Committee
RMG	Ready Made Garments
RPL	Recognition of Prior Learning
SSC (Voc)	Secondary School Certificate (Vocational)
STEP	Skills and Training Enhancement project (WB)
ISC	Industry Skills Council
TESDA	Technical Education and Skills Development Authority
TL	Team Leader
TSC	Technical Sub Committee
TVET	Technical and Vocational Education and Training
WB	World Bank
DACUM	Development of a Curriculum
CBLM	Competency based learning Materials

### Section 1. The Qualification

1. Title of Qualification: National Skills Certificate-III in Plumbing (Construction Sector)	
2. Qualification code:	3. Endorsement date:
CONPLM020312A	10 April 2012
4. Purpose of the qualification	<p>The NSC III in Plumbing Qualification consists of a set of competencies that a person must achieve in order to work competently in the Construction Sector as a Plumber.</p> <p>In particular, he/she should be able to:</p> <ol style="list-style-type: none"> <li>1. Perform plumbing layout</li> <li>2. Perform plumbing fixture installation and assemblies</li> <li>3. Install hot and potable chilled water piping system</li> <li>4. perform plumbing system installation and assemblies in multi-storied building (up to 6 storied)</li> </ol>
5. Regulatory Arrangements	The holder of this qualification should have been assessed by a BTEB certified assessor and found to be competent in the units listed in Section 2.
6. Accreditation requirements	The qualifications shall be offered in compliance with the accreditation requirements set by BTEB.
7. Transition arrangements	In the absence of certified assessors, the BTEB shall appoint trainers who have undergone assessment trainings.
8. Contact for comments	<p>Chairperson</p> <p>Bangladesh Technical Education Board (BTEB) Agargaon, Sheer-E-Bangla Nagar, Dhaka-1207.</p>



## Section 2: National Competency Standards for

### National Skills Certificate in Plumbing

#### Generic Competencies

Code	Unit of Competency	Level	No. of Hrs.
GN100112A	Communicate in the workplace	1	30
GN100212A	Work in a team environment	1	18
GN100312A	Practice workplace cleanliness	1	18
GN100412A	Practice occupational health and safety (OHS) Procedure	1	30
GN300512A	Demonstrate work values	3	18
GN300612A	Lead small team	3	18
GN300712A	Practice negotiation skills	3	24
<b>Total</b>			156 hrs.

#### Sector Specific Competencies

Code	Unit of Competency	Level	No. of Hrs.
CON100112A	Work in the construction sector	1	24
CON100212A	Interpret drawings and specifications in plumbing manuals	1	30
CON100312A	Use hand tools and power tools for plumbing	1	30
CON200412A	Perform measurement and calculations in plumbing	2	48
CON200512A	Maintain tools and equipment	2	30
<b>Total</b>			162 hrs.

## Occupation Specific Competencies

Code	Unit of Competency	Level	No. of Hrs.
CONPLM100112A	Fabricate pipes	1	45
CONPLM100212A	Prepare pipes for installation	1	45
CONPLM100312A	Make pipe joints and connections	1	45
CONPLM100412A	Perform cutting and penetration for plumbing works	1	45
CONPLM200512A	Install water supply pipe with fittings	2	42
CONPLM200612A	Install waste water pipe with fittings	2	42
CONPLM200712A	Install plumbing fixtures	2	48
CONPLM200812A	Conduct pipe leakage testing	2	30
CONPLM200912A	Repair and maintenance works for plumbing	2	30
CONPLM301012A	Perform plumbing layout.	3	50
CONPLM301112A	Perform plumbing fixture installation and assemblies	3	55
CONPLM301212A	Install hot and potable chilled water piping system.	3	50
CONPLM301312A	Perform plumbing system installation and assemblies in multi-storied building (up to 6 storied)	3	55
<b>Total</b>			582 hrs.
<b>Grant Total</b>			900 hrs.

## Course Structure for National Skills Certificate in Plumbing For Level - III

### Generic Competencies

Code	Unit of Competency	Level	No. of Hrs
GN300512A	Demonstrate work values	3	18
GN300612A	Lead small team	3	18
GN300712A	Practice negotiation skills	3	24
<b>Total</b>			60 hrs.

### Occupation Specific Competencies

Code	Unit of Competency	Level	No. of Hrs
CONPLM301012A	Perform plumbing Layout.	3	45
CONPLM301212A	Perform plumbing fixture installation and assemblies	3	45
CONPLM301312A	Install hot and potable chilled water piping system.	3	45
CONPLM301412A	Perform plumbing system installation and assemblies in multi-storied building (up to 6 storied)	3	45
<b>Total</b>			180 hrs.
<b>Grand Total</b>			270 hrs.

### Section-3: Generic Competencies

Unit of Competency	<b>Demonstrate work values</b>
Unit Code	GN300512A
Unit Descriptor	This unit covers the knowledge, skills, and attitude required to demonstrate work value. It includes defining purpose, applying work values, dealing with ethical problems, planning and practicing negotiations.
Nominal Hours	18 hours.

<b>Elements of Competency</b>	<b>Performance Criteria</b>
	Bold italicized words are detailed in the Range of Variables
1. Define the purpose of work	1.1 One's unique sense of purpose for working and the why's of work are identified, reflected on and clearly defined for one's development as a person and as a member of society. 1.2 Personal mission is in harmonized
2. Apply work values/ethics	2.1 <b>Work values/ethics/concepts</b> are classified and reaffirmed in accordance with the transparent company ethical standards, policies and guidelines. 2.2 <b>Work practices</b> are undertaken in compliance with industry work ethical standards, organizational policy and guidelines. 2.3 Personal behavior and relationships with co-workers standards, policy and guidelines. 2.4 <b>Company resources</b> are used in accordance with transparent company ethical standard, policies and guidelines.
3. Deal with ethical problems	3.1 Company ethical standard, organizational policy and guidelines on the prevention and reporting of unethical conduct are accessed and applied in accordance with transparent company ethical standard, policies and

	<p>guidelines.</p> <p>3.2 Work <b>incidents/situations</b> are reported and/or resolved in accordance with company protocol/guidelines.</p> <p>3.3 Resolution and/or referral of ethical problems identified are used as learning opportunities.</p>
4. Maintain integrity of conduct in the workplace	<p>4.1 Personal work practices and values are demonstrated consistently with acceptable ethical conduct and company's core values.</p> <p>4.2 Instructions to co-workers are provided based on ethical, lawful and reasonable directives.</p> <p>4.3 Company values/practices are shared with co-workers using appropriate behavior and language.</p>
5. Plan negotiations	<p>5.1 Information on preparing for negotiation is identified and included in the plan.</p> <p>5.2 Information on creating <b>non verbal environments</b> for positive negotiating is identified and included in the plan.</p> <p>5.3 Information on active listening is identified and included in the plan.</p> <p>5.4 Information is checked to ensure it is correct and up-to-date</p>
6. Participate in negotiations	<p>6.1 Criteria for successful outcome are agreed upon by all parties.</p> <p>6.2 Desired outcome of all parties are considered.</p> <p>6.3 Appropriate language is used throughout the negotiation.</p> <p>6.4 A variety of questioning techniques are used.</p> <p>6.5 The issues and processes are documented and agreed upon by all parties.</p> <p>6.6 Possible solutions are discussed and their viability assessed</p> <p>6.7 Areas for agreement are confirmed and recorded.</p> <p>6.8 Follow-up action is agreed upon by all parties.</p>



**Range of Variables**

<b>Variable</b>	<b>Range</b> (Included but not limited to):
1. Work values/ethics/ concepts	May include but are not limited to: <ul style="list-style-type: none"> <li>1.1 Commitment/Dedication</li> <li>1.2 Sense of urgency</li> <li>1.3 Sense of purpose</li> <li>1.4 Love for work</li> <li>1.5 High motivation</li> <li>1.6 Orderliness</li> <li>1.7 Reliability</li> <li>1.8 Competence</li> <li>1.9 Dependability</li> <li>1.10 Goal-oriented</li> <li>1.11 Sense of responsibility</li> <li>1.12 Being knowledgeable</li> <li>1.13 Loyalty to work/company</li> <li>1.14 Sensitivity to others</li> <li>1.15 Compassion/Caring attitude</li> <li>1.16 Balancing between family and work</li> <li>1.17 Spirit/teamwork</li> <li>1.18 Sense of nationalism</li> </ul>
2. Work practices	<ul style="list-style-type: none"> <li>2.1 Quality of work.</li> <li>2.2 Punctuality</li> <li>2.3 Efficiency</li> <li>2.4 Effectiveness</li> <li>2.5 Productivity</li> <li>2.6 Resourcefulness</li> <li>2.7 Innovativeness/Creativity</li> <li>2.8 Cost consciousness</li> <li>2.9 5S</li> </ul>

	2.10 Attention to details
3. Incidents/situations	<p>3.1 Violent/intense dispute or argument</p> <p>3.2 Gambling</p> <p>3.3 Use of prohibited substances</p> <p>3.4 Pilferages</p> <p>3.5 Damage to person or property</p> <p>3.6 Vandalism</p> <p>3.7 Falsification</p> <p>3.8 Bribery</p> <p>3.9 Sexual Harassment</p> <p>3.10 Blackmail</p>
4. Company resources	<p>4.1 Consumable materials</p> <p>4.2 Equipment/Machineries</p> <p>4.3 Human</p> <p>4.4 Time</p> <p>4.5 Financial resources</p>
5. Instructions	<p>5.1 Verbal</p> <p>5.2 written</p>
6. Preparing for negotiation	<p>6.1 Background information on other parties to the negotiation</p> <p>6.2 Good understanding of topic to be negotiated</p> <p>6.3 Clear understanding of desired outcome/s</p> <p>6.4 Personal attributes</p> <p>6.5 Interpersonal skills</p> <p>6.5.1 listening/reflecting</p> <p>6.5.2 non verbal communication</p> <p>6.5.3 assertiveness</p> <p>6.5.4 behavior labeling</p> <p>6.5.5 testing understanding</p> <p>6.5.6 seeking information</p> <p>6.5.7 Self disclosing</p> <p>6.6 Analytic skills</p> <p>6.6.1 Observing differences between content and</p>

	<p>process</p> <p>6.6.2 identifying bargaining information</p> <p>6.6.3 applying strategies to manage process</p> <p>6.6.4 Applying steps in negotiating process</p> <p>6.6.5 Strategies to manage conflict</p> <p>6.6.6 Steps in negotiating process</p> <p>6.6.7 Options within organization and externally for resolving conflict</p>
7. Non verbal environments	<p>7.1 Friendly reception</p> <p>7.2 Warm and welcoming room</p> <p>7.3 Refreshments offered</p> <p>7.4 Lead in conversation before negotiation begins</p>
8. Active listening	<p>8.1 Attentive</p> <p>8.2 Don't interrupt</p> <p>8.3 Good posture</p> <p>8.4 Maintain eye contact</p> <p>8.5 Reflective listening</p>
9. Questioning techniques	<p>9.1 Direct</p> <p>9.2 Indirect</p> <p>9.3 Open-ended</p>

### Evidence Guide

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Defined one's unique sense of purpose for working</p> <p>1.2 Clarified and affirmed work values/ethics/ concepts consistently in the workplace</p> <p>1.3 Demonstrated work practices satisfactorily and consistently in compliance with industry work ethical standards, organizational policy and guidelines</p> <p>1.4 Demonstrated personal behavior and relationships with co-workers and/or clients consistent with ethical standards policy and</p>
-----------------------------------	---



	<p>guidelines</p> <p>1.5 Used company resources in accordance with company ethical standard, policies and guidelines.</p> <p>1.6 Followed company ethical standards, organizational policy and guidelines on the prevention and reporting of unethical conduct/behavior</p> <p>1.7 Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome</p> <p>1.8 Participated in negotiation with at least one person to achieve an agreed outcome</p>
2. Underpinning knowledge	<p>2.1 Occupational health and safety</p> <p>2.2 Work values and ethics</p> <p>2.3 Company performance and ethical standards</p> <p>2.4 Company policies and guidelines</p> <p>2.5 Fundamental rights at work.</p> <p>2.6 Work responsibilities/job functions</p> <p>2.7 corporate social responsibilities</p> <p>2.8 Company code of conduct/values</p> <p>2.9 Balancing work and family responsibilities</p> <p>2.10 Codes of practice and guidelines for the organization</p> <p>2.11 Organization policy and procedures for negotiations</p> <p>2.12 Decision making and conflict resolution strategies procedures</p> <p>2.13 Problem solving strategies.</p>
3. Underpinning Skills	<p>3.1 Interpersonal skills to develop report.</p> <p>3.2 Communication skills (verbal and listening)</p> <p>3.3 Self awareness, understanding and acceptance</p> <p>3.4 Application of good manners and right conduct</p> <p>3.5 Observation skills</p> <p>3.6 Negotiation skills</p>



4. Underpinning Attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Environmental concerns</p> <p>4.3 Eagerness to learn</p> <p>4.4 Tidiness and timeliness</p> <p>4.5 Respect for rights of peers and seniors in workplace</p> <p>4.6 Communication with peers and seniors in workplace</p>
5. Resource implications	<p>The following resources should be provided:</p> <p>5.1 Workplace or assessment location</p> <p>5.2 Case studies/Scenarios</p> <p>5.3 Room with facilities necessary for the negotiation process</p> <p>5.5 Human resources (negotiators)</p>
6. Methods of assessment	<p>Competency should be assessed by</p> <p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral Interview</p> <p>6.4 Written examinations</p> <p>6.5 Portfolio</p>
7. Context of assessment	<p>For certification competency should be assessed individually in the actual work place after completion of the module.</p>
<p><b>Accreditation Requirements</b></p> <p>Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.</p> <p>Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.</p>	



Unit of Competency	<b>Lead small teams</b>
Unit Code	GN300612A
Unit Descriptor	This unit covers the knowledge, skills, and attitude required to lead small team.  It includes lead small teams including setting and maintaining team and individual performance standards.
Nominal Hours	18 hours

<b>Elements of Competency</b>	<b>Performance Criteria</b>
	Bold italicized words are detailed in the Range of Variables
1. Provide team leadership	1.1 <b>Work requirements</b> are identified and presented to team members  1.2 Reasons for instructions and requirements are communicated to team members  1.3 <b>Team members' queries and concerns</b> are recognized, discussed and dealt with
2. Assign responsibilities	2.1 Duties, and responsibilities are allocated having regard to the skills, knowledge and aptitude required to properly undertake the assigned task and according to company policy  2.2 Duties are allocated having regard to individual preference, domestic and personal considerations, whenever possible
3. Set performance expectations for team members	3.1 Performance expectations are established based on client needs and according to assignment requirements  3.1 Performance expectations are based on individual team members duties and area of responsibility  3.2 Performance expectations are discussed and disseminated to individual team members
4. Supervise team performance	4.1 <b>Monitoring of performance</b> are taken place against defined performance criteria and/or assignment instructions and corrective

	<p>action taken if required</p> <p>4.2 Team members are provided with <b>feedback</b>, positive support and advice on strategies to overcome any deficiencies</p> <p>4.3 <b>Performance issues</b> which cannot be rectified or addressed within the team are referenced to appropriate personnel according to employer policy</p> <p>4.4 Team members are kept informed of any changes in the priority allocated to assignments or tasks which might impact on client/customer 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 in accordance with company procedures</p>
--	--

### Range of Variables

Variables	Range (Included but not limited to):
1. Work requirements	1.1 Client Profile 1.2 Assignment instructions
2. Team member's concerns	2.1 Roster/shift details
3. Monitor performance	3.1 Formal process 3.2 Informal process
4. Feedback	4.1 Formal process 4.2 Informal 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

**Evidence Guide**

1. Critical aspects of competency	<p>Assessment requires evidence that the candidate:</p> <p>1.1 Maintained or improved individuals and/or team performance given a variety of possible scenario</p> <p>1.2 Assessed and monitored team and individual performance against set criteria</p> <p>1.3 Represented concerns of a team and individual to next level of management or appropriate specialist and to negotiate on their behalf</p> <p>1.4 Allocated duties and responsibilities, having regard to individual's knowledge, skills and aptitude and the needs of the tasks to be performed</p> <p>1.5 Set and communicated performance expectations for a range of tasks and duties within the team and provided feedback to team members</p>
2. Underpinning knowledge	<p>2.1 Company policies and procedures</p> <p>2.2 Relevant legal requirements</p> <p>2.3 How performance expectations are set</p> <p>2.4 Methods of monitoring performance</p> <p>2.5 Client expectations</p> <p>2.6 Team member's duties and responsibilities</p>
3. Underpinning Skills	<p>3.1 Communication skills required for leading teams</p> <p>3.2 Informal performance counseling skills</p> <p>3.3 Team building skills</p> <p>3.3 Negotiating skills</p>
4. Underpinning Attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Environmental concerns</p> <p>4.3 Eagerness to learn</p>

	<p>4.4 Tidiness and timeliness</p> <p>4.5 Respect for rights of peers and seniors in workplace</p>
5. Resource implications	<p>The following resources should be provided:</p> <p>5.1 Access to relevant workplace or appropriately simulated environment where assessment can take place</p> <p>5.2 Materials relevant to the proposed activity or task</p>
6. Methods of assessment	<p>Competency should be assessed by</p> <p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral Interview</p> <p>6.4 Written examinations</p> <p>6.5 Portfolio</p>
7. Context of assessment	<p>For certification competency should be assessed individually in the actual work place after completion of the module.</p>
<p><b>Accreditation Requirements</b></p> <p>Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.</p> <p>Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.</p>	



Unit of Competency	<b>Practice negotiation skills</b>
Unit Code	GN300712A
Unit Descriptor	This unit covers the knowledge, skills, and attitude required perform routine maintenance.  It includes following references, maintaining tools and equipment, following routine of maintenance, inspecting work area, inspecting regulators and gauges, inspecting fittings and connections.
Nominal Hours	18 hours

<b>Elements of Competency</b>	<b>Performance Criteria</b>
	Italicized terms are elaborated in the Range of variables
1. Plan negotiations	<p>1.1 Information on <b><i>preparing for negotiation</i></b> are identified and included in the plan.</p> <p>1.2 Information on creating <b><i>non verbal environments</i></b> for positive negotiating is identified and included.</p> <p>1.3 Information on <b><i>active listening</i></b> is identified and included in the plan.</p> <p>1.4 Information on different <b><i>questioning techniques</i></b> is identified and included in the plan</p> <p>1.5 Information is checked to ensure it is correct and up-to-date.</p>
2. Participate in negotiations	<p>2.1 Criteria for successful outcome are agreed upon by all parties.</p> <p>2.2 Desired outcome of all parties are considered.</p> <p>2.3 Appropriate language is used throughout the negotiation.</p> <p>2.4 A variety of questioning techniques are used for justification.</p> <p>2.5 The issues and processes are documented and agreed upon by all parties.</p> <p>2.6 Possible solutions are discussed and their</p>

	<p>viability assessed.</p> <p>2.7 Areas for agreement are confirmed and recorded.</p> <p>2.8 Follow-up action is agreed upon by all parties.</p>
--	--

### Range of Variables

<b>Variables</b>	<b>Range</b> (Included but not limited to):
1.Preparing for negotiation	<p>1.1 Background information on other parties to the negotiation</p> <p>1.2 Good understanding of topic to be negotiated</p> <p>1.3 Clear understanding of desired outcome/s</p> <p>1.4 Personal attributes</p> <p>    1.4.1 self esteem</p> <p>    1.4.2 self esteem</p> <p>    1.4.3 objectivity</p> <p>    1.4.4 empathy</p> <p>    1.4.5 respect for others</p> <p>1.5 Interpersonal skills</p> <p>    1.5.1 listening/reflecting</p> <p>    1.5.2 non verbal communication</p> <p>    1.5.3 assertiveness</p> <p>    1.5.4 behavior labeling</p> <p>    1.5.5 testing understanding</p> <p>    1.5.6 seeking information</p> <p>    1.5.7 self disclosing</p> <p>1.6 Analytic skills</p> <p>    1.6.1 observing differences between content and process</p> <p>    1.6.2 identifying bargaining information</p> <p>    1.6.3 applying strategies to manage process</p> <p>    1.6.4 applying steps in negotiating process</p> <p>    1.6.5 strategies to manage conflict</p> <p>    1.6.6 steps in negotiating process</p>





	1.6.7 options within organization and externally for resolving conflict
2. Non verbal environments	2.1 Friendly reception. 2.2 Warm and welcoming room 2.3 Refreshments offered 2.4 Lead in conversation before negotiation begins
3. Active listening	3.1 Attentive 3.2 Don't interrupt 3.3 good posture 3.4 Maintain eye contact 3.5 Reflective listening
4. Questioning techniques	4.1 Direct 4.2 Indirect 4.3 Human Open-ended

### Evidence Guide

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Demonstrated sufficient knowledge of the factors influencing negotiation to achieve agreed outcome 1.2 Participated in negotiation with at least one person to achieve an agreed outcome
2. Underpinning knowledge	2.1 Codes of practice and guidelines for the organization 2.2 Organization policy and procedures for negotiations 2.3 Decision making and conflict resolution strategies procedures 2.4 Problem solving strategies. 2.5 Flexibility 2.6 Empathy
3. Underpinning Skills	3.1 Interpersonal skills to develop. 3.2 Communication skills (verbal and listening)



	3.3 Observation skills 3.4 Negotiation skills
4. Underpinning Attitudes	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implications	The following resources should be provided: 5.1 Room with facilities necessary for the negotiation process 5.2 Human resources (negotiators)
6. Methods of assessment	Competency should be assessed by 6.1 Workplace observation 6.2 Demonstration 6.3 Oral Interview 6.4 Written examinations 6.5 Portfolio
7. Context of assessment	For certification competency should be assessed individually in the actual work place after completion of the module.
<p><b>Accreditation Requirements</b></p> <p>Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.</p> <p>Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.</p>	



### Section 5. The Occupation Specific Competencies

Unit of Competency	<b>Perform plumbing Layout.</b>
Unit Code	CONPLM301012A
Unit Descriptor	This unit covers the knowledge, skills and attitude required to perform plumbing Layout.  It includes collecting tools equipment and materials, cutting pipes and Installing waste water pipes for sanitation.
Nominal Hours	45 hours

Elements of Competency	Performance Criteria
	Bold italicized words are detailed in the Range of Variables
<b>OHS</b>	
1. Identify area and location	1.1 <b>Tools and Material</b> are selected and collected. 1.2 Area and location are identified.
2. Lay-out plumbing plan	2.1 <b>PPE</b> are collected and used. 2.2 Lay-out marking is approximately done. 2.3 Plumbing plan is laid-out.
3. Set out plumbing layout.	3.1 <b>Spike</b> is placed. 3.2 Line <b>thread</b> is linked to the spikes. 3.3 Finally layout is performed by light pressure on line thread.

#### Range of Variables

Variable	Range (Include but not limited to):
1. Tools and materials	1.1 Paper 1.2 Pen and pencil 1.3 Eraser 1.4 Drawing instruments 1.5 Ball-pin hammer 1.6 Spike 1.7 Thread 1.8 Claw hammer

2.Drawing	2.1 Building plan 2.2 Plumbing drawing
3.PPE	3.1 hand glove 3.2 Musk 3.3 Gum boot
4.Plumbing elements	4.1 Fixtures location 4.2 Drainage and sewerage line 4.3 Vent Pipe line 4.4 Hot & cold water line 4.5 Rain water line
5.Spike	5.1 2 inch nail 5.2 2.5 inch nail
6.Thread	6.1 Line thread 6.2 Nylon thread

### Evidence Guide

1. Critical aspects of Competency	Competency assessment requires evidence that the candidate : 1.1 Selected and collected tools and Material as per work requirement 1.2 Identified area and location as per working drawing. 1.3 Did marking approximately following drawing. 1.4 Laid-out plumbing plan following the specifications and consideration with the plumbing elements. 1.5 Placed spike following the plumbing plan to the working place. 1.6 linked line thread to the spikes. 1.6 Did marking finally by light pressure on line thread.
2.Underpinning knowledge	2.1 Tools and material identification 2.2 PPE selection 2.3 Drawing understanding.
3.Underpinning skill	3.1 Interpreting drawing 3.2 Linking thread 3.3 Marking line



4. Underpinning Attitude	4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace
5. Resource implication	The following resources should be provided : 5.1 Workplace location. 5.2 Appropriate drafting instrument. 5.3 Materials relevant to the proposed activity. 5.4 Drawings and specifications relevant to the task.
6. Methods of assessment	Competency should be assessed by 6.1 Workplace observation 6.2 Demonstration 6.3 Oral Interview 6.4 Written examinations 6.5 Portfolio
7. Context for assessment	For certification competency should be assessed individually in the actual work place after completion of the module.

#### **Accreditation Requirements**

Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.



Unit of Competency	<b>Perform plumbing fixtures installation and assemblies.</b>
Unit Code	CONPLM301112A
Unit Descriptor	This unit covers the knowledge, skills and attitude required to perform plumbing fixture installation and assemblies  It includes collecting tools equipment and materials, cutting pipes and installing waste water pipes for sanitation.
Nominal Hours	45 hours

<b>Elements of Competency</b>	<b>Performance Criteria</b>
	Bold Italicized words are detailed in the Range of Variables
1. Prepare plumbing works	1.1 Work instructions/plans are read and interpreted. 1.2 Materials, <b>tools and equipment</b> are selected and collected.
2. Install pipes and fittings (Sanitary System)	2.1 <b>PPE</b> are collected and used. 2.2 <b>Pipes and fittings</b> are installed with a standard <b>slope</b> . 2.3 Drainage/sewer/vent piping system are aligned with water supply and provided with clean-outs in the required locations. 2.4 <b>Fittings</b> are used in installing drainage/sewer piping.
3. Install hot and cold water supply system	3.1 Pipes and <b>joints</b> are made. 3.2 Hot and cold water supply is installed. 3.3 <b>Water supply</b> assembles are perform with leak free and aligned with drainage/vent/waste piping. 3.4 Water supply assembles are checked to contaminate free.
4. Install/assemble plumbing fixtures	4.1 Water pipes for all joints are installed at least 0.3 meter from the sewer or drain line. 4.2 <b>Plumbing fixtures</b> are installed according to specified rough-in measurements. 4.3 Plumbing fixtures are rigidly secured with strict adherence to perpendicularity and levelness.

5. Clean the workplace	<p>5.1 Cleaning tools and equipment are collected and prepared.</p> <p>5.2 Used tools &amp; equipment are cleaned.</p> <p>5.3 Work site is cleaned and kept in safe state.</p> <p>5.4 Waste materials are disposed in proper place.</p>
------------------------	---

### Range of Variables

<b>Variable</b>	<b>Range</b> (Include but not limited to):
1. Tools and equipment	<p>1.1 Pipe threader.</p> <p>1.2 Monkey wrench.</p> <p>1.3 Push – pull rule/steel tape.</p> <p>1.4 Reamer.</p> <p>1.5 Blow torch</p> <p>1.6 Flaring/Swaging tools.</p> <p>1.7 Pipe cutter/hacksaw.</p> <p>1.8 Hammer.</p> <p>1.9 Leveling tools.</p> <p>1.10 Bench vice</p>
2. PPE (Personal Protective Equipment)	<p>2.1 Gloves.</p> <p>2.2 Hard hat.</p> <p>2.3 Shoes.</p>
3. Pipes and fittings	<p>3.1. PVC/uPVC pipes and fittings</p> <p>3.2. PPR pipes and fittings</p> <p>3.3. G.I. pipes and fittings</p> <p>3.4. C.I. pipes and fittings</p> <p>3.5. Copper pipe</p> <p>3.6. Drainage/ sewer vent pipes</p>
4. Slope/gradient	<p>4.1 1:100</p> <p>4.2 1:10</p>
5. Fittings	<p>5.1 Elbow</p> <p>5.2 Bend</p> <p>5.3 Socket</p> <p>5.4 Nipple</p> <p>5.5 Union socket</p>



	<p>5.6 Gate valve</p> <p>5.7 Reducer</p> <p>5.8 Tee</p> <p>5.9 Faucet</p> <p>5.10 Stop cock</p>
6. Joints	<p>6.1 Tee joint</p> <p>6.2 Y-joint</p> <p>6.3 L- joint</p> <p>6.4 Cross joint</p>
7. Water supply	<p>7.1 Horizontal supply</p> <p>7.2 Vertical supply</p> <p>7.3 Inclined supply</p> <p>7.4 Curve supply</p>
8. Plumbing fixtures	<p>8.1 Bath tub</p> <p>8.2 Shower</p> <p>8.3 Basin</p> <p>8.4 Faucets</p> <p>8.5 Commode</p> <p>8.6 Urinal</p> <p>8.7 Water closet</p> <p>8.8 Sink</p> <p>8.9 Looking Glass</p> <p>8.10 Soap Case</p> <p>8.11 Towel rail</p> <p>8.12 Glass Shelve</p> <p>8.13 Paper holder</p> <p>8.14 Push Shower</p>





**Evidence Guide**

1. Critical aspects of Competency	<p>Competency assessment requires evidence that the candidate :</p> <p>1.1 Read and interpreted work instructions.</p> <p>1.2 Selected materials, tools and equipment with job requirements.</p> <p>1.3 Installed pipes and fittings with a standard slope/gradient in accordance of Bangladesh National Building Code.</p> <p>1.4 Prepared pipes and joints in accordance with the job requirements/specifications.</p> <p>1.5 Installed hot and cold water supply according to the approved working plan.</p> <p>1.6 Installed water pipes for all joints at least 0.3 meter from the sewer or drain line.</p> <p>1.7 Installed Plumbing fixtures according to specified rough-in measurements and/or manufacturer's specifications and required standard in the RNPCP.</p> <p>1.8 Secured plumbing fixtures rigidly with strict adherence to perpendicularity and levelness.</p>
2. Underpinning Knowledge	<p>2.1 Tools and equipment identification</p> <p>2.2 PPE selection</p> <p>2.3 Instruction understanding.</p> <p>2.4 Types of Joints</p> <p>2.5 Different types of plumbing fixture</p> <p>2.6 Different types fittings</p>
3. Underpinning skills	<p>3.1 Installation of pipes and fittings</p> <p>3.2 Installation of joints</p> <p>3.3 Installation of fixture</p> <p>3.4 Cleaning tools and work place</p>
4. Underpinning Attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Environmental concerns</p> <p>4.3 Eagerness to learn</p> <p>4.4 Tidiness and timeliness</p> <p>4.6 Respect for rights of peers and seniors in</p>

	workplace 4.6 Communication with peers and seniors in workplace
5. Resource implication	The following resources should be provided- 5.1 Work place location. 5.2 Tools and equipment are available. 5.3 Materials relevant to proposed activity. 5.4 Drawing and specifications relevant to the task.
6. Methods of assessment	Competency should be assessed by 6.1 Workplace observation 6.2 Demonstration 6.3 Oral Interview 6.4 Written examinations 6.5 Portfolio
7. Context for assessment	For certification competency should be assessed individually in the actual work place after completion of the module.

#### **Accreditation Requirements**

Training providers must be accredited by Bangladesh Technical Education Board(BTEB) , the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.



Unit Competency	<b>Install hot and potable chilled water piping system.</b>
Unit Code	CONPLM301212A
Unit Descriptor	This unit covers the knowledge, skills and attitude required to Install hot and potable chilled water piping system. It includes preparing, connecting, and installing hot and potable chilled water supply using copper pipes and fittings and other related materials.
Nominal Hours	45 hours

<b>Elements of Competency</b>	<b>Performance Criteria</b>
	Bold italicized words are detailed in the Range of Variables
1. Prepare pipes for installation	1.1 <b><i>PPE</i></b> are collected and used. 1.2 Work instructions are read and interpreted. 1.3 <b><i>Tools and equipment</i></b> are collected and prepared. 1.4 <b><i>Pipes and fittings</i></b> are prepared.
2. Perform hot and potable chilled water piping installation	2.1 Hot and potable pipes and fittings are aligned and connected and welded. 2.2 Pipe support/braces/insulation materials are installed.
5. Clean the workplace	5.1 Cleaning tools and equipment are collected and prepared. 5.2 Used tools & equipment are cleaned. 5.3 Work site is cleaned and kept in safe state. 5.4 <b><i>Waste materials</i></b> are disposed in proper place.

**Range of Variables:**

<b>Variable</b>	<b>Range</b> (Include but not limited to):
1. PPE	1.1 Gloves. 1.2 Hard hat. 1.3 Shoes. 1.4 Goggles.
2. Tools and equipment	2.1 Pipe threader 2.2 Pipe cutter. 2.3 Swaging tools. 2.4 Flaring tools.

	<p>2.5 Aligning tools.</p> <p>2.6 Bending machine.</p> <p>2.7 Measuring tools</p> <p>2.8 Adjustable wrench</p> <p>2.9 Pipe wrench</p> <p>2.10 Reamer</p>
3. Pipes and fittings	<p>3.1 PVC/uPVC pipes and fittings</p> <p>3.2 PPR pipes and fittings</p> <p>3.3 G.I. pipes and fittings</p> <p>3.4 C.I. pipes and fittings</p> <p>3.5 Copper pipe</p>
4. Waste materials	<p>4.1 Soldering paste.</p> <p>4.2 Brazing compound</p>

### Evidence Guide

1. Critical aspects of Competency	<p>Competency assessment requires evidence that the candidate:</p> <p>1.1 Read and interpreted work instructions with the job requirements.</p> <p>1.2 Prepared Pipes and fittings according to the job requirements.</p> <p>1.3 Aligned and connected hot and potable pipes and fittings and welded consistent with job requirements.</p> <p>1.4 Aligned and connected pipes and fittings and welded consistent with job requirements.</p>
2. Underpinning knowledge	<p>2.1 Mensuration</p> <p>2.2 PPE selection</p> <p>2.3 Pipe tolerance</p> <p>2.4 Tools and equipment identification</p>
3. Underpinning skills	<p>3.1 Interpreting plan and drawing.</p> <p>3.2 Preparing pipes and fitting</p> <p>3.3 Aligning hot and chilled water pipe</p> <p>3.4 Cleaning tools and work place.</p>
4. Underpinning Attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Environmental concerns</p>

	<p>4.3 Eagerness to learn</p> <p>4.3 Tidiness and timeliness</p> <p>4.5 Respect for rights of peers and seniors in workplace</p> <p>4.6 Communication with peers and seniors in workplace</p>
5. Resource Implications	<p>The following resources should be provided-</p> <p>5.1 Work place location.</p> <p>5.2 Tools and equipment are available.</p> <p>5.3 Materials relevant to proposed activity</p> <p>5.4 Drawing and specifications relevant to the task.</p>
6. Methods of Assessment	<p>Competency should be assessed by</p> <p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral Interview</p> <p>6.4 Written examinations</p> <p>6.5 Portfolio</p>
7. Context for assessment	<p>For certification competency should be assessed individually in the actual work place after completion of the module.</p>

#### **Accreditation Requirements**

Training providers must be accredited by Bangladesh Technical Education Board (BTEB), the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.



Unit Competency	<b>Perform plumbing system installation and assemblies in multi-storied building ( up to 6 storied )</b>
Unit Code	CONPLM3001312A
Unit Descriptor	This unit covers the knowledge; skills and attitudes required to perform plumbing system installation and assemblies in multi-storied building (up to 6 storied)  It includes installing pipes and fittings for hot and cold water supply, assembling plumbing fixture and installing drain and sewer.
Nominal Hours	45 hours

<b>Elements of Competency</b>	<b>Performance Criteria</b>
	Bold italicized words are detailed in the Range of Variables
1. Collect plumbing tools and equipment	1.1 Work instructions/plans are read and interpreted. 1.2 Materials, <b>tools and equipment</b> are collected and prepared.
2. Install pipes and fittings	2.1 <b>PPE</b> are collected and used. 2.2 <b>Pipes and fittings</b> are installed. 2.3 Pipe <b>supports and braces</b> are installed rigidly and secured.
3. Install hot and cold water supply line	3.1 Hot and cold water supply is installed. 3.2 Water supply assembled is tested with leak free and aligned with drainage/vent/waste piping. 3.3 Water supply assembled is checked to contaminate free.
4. Install building drains/sewer	4.1 Building <b>drains</b> are constructed. 4.2 Building sewer lines are installed. 4.3 Standard <b>slope</b> is maintained.
5. Install/assemble plumbing fixtures	5.1 Plumbing <b>fixtures</b> are installed. 5.2 Plumbing fixtures are rigidly secured with proper adherence to perpendicularity and levelness 5.3 Water supply assembled is leaked free from contaminations and aligned with drainage/vent/ waste piping

6.Clean the workplace	6.1 Cleaning tools and equipment are collected and prepared. 6.2 Used tools & equipment are cleaned. 6.3 Work site is cleaned and kept in safe state. 6.4 Waste materials are disposed in proper place.
-----------------------	--

### Range of Variables

Variable	Range (Include but not limited to):
1. Tools and Equipment	1.1 Pipe thread cutter 1.2 Monkey wrench 1.3 Push – pull rule/steel tape 1.4 Reamer 1.5 Blow torch 1.6 Flaring/Swaging tools 1.7 Pipe cutter/hacksaw 1.8 Hammer 1.9 Leveling tools 1.10 Welding machine 1.11 Threading machine 1.12 Electric drill
2. PPE (Personal Protective Equipment)	2.1. Gloves 2.2. Hard hat 2.3. Shoes 2.4. Goggles 2.5. Safety belt
3. Pipes and fittings	Includes but not limited to: 3.1. PVC/uPVC (Un-plasticized) 3.2. PPR (Poly propylene random) pipes and fittings 3.3. G.I. pipes and fittings 3.4. C.I. pipes and fittings 3.5. Copper pipes and fittings 3.6. Drainage/sewer vent stack 3.7. Circuit/loop vent 3.8. Riser

4.Supports and braces	4.1 Saddle 4.2 Clamp 4.3 Cleat 4.4 Groove plaster
5. Joints	5.1 Tee joint 5.2 Y-joint 5.3 L- joint 5.4 Cross joint 5.5 Elbow joint
6. Drains	6.1 U-Drains 6.2 Trapezoidal drain 6.3 Circular drain 6.4 Square drain
7. Slope	7.1 1:100 7.2 1:10
8. Plumbing fixtures	8.1 Bath tub 8.2 Shower 8.3 Basin 8.4 Faucets 8.5 Commode 8.6 urinal 8.7 Water closet 8.8 Sink





**Evidence Guide**

1. Critical aspects of competency	<p>Competency assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> <li>1.1 Read and interpreted work instructions.</li> <li>1.2 Collected and prepared materials, tools and equipment.</li> <li>1.3 Prepared pipes and fittings according to the job requirements.</li> <li>1.4 Installed hot and cold water supply according to the approved working plan.</li> <li>1.5 Did water supply assembled with leak free and aligned with drainage/vent/waste piping.</li> <li>1.6 Installed building sewer lines as per working plan.</li> <li>1.7 Maintained standard slope as per drawing</li> <li>1.8 Installed plumbing fixtures according to specified rough-in measurements and standard procedure.</li> </ul>
2. Underpinning Knowledge	<ul style="list-style-type: none"> <li>2.1 Tools and equipment identification</li> <li>2.2 Material selection</li> <li>2.3 PPE selection</li> <li>2.4 Knowledge of plumbing processes</li> </ul>
3. Underpinning Skills	<ul style="list-style-type: none"> <li>3.1 Interpreting plan and drawing</li> <li>3.2 Preparing pipes and joints</li> <li>3.3 Installing pipes</li> <li>3.4 Maintaining slope</li> <li>3.5 Fixing joints</li> <li>3.6 Installing fixtures</li> <li>3.7 Cleaning tools and equipment and work place</li> </ul>



4. Underpinning Attitudes	<p>4.1 Commitment to occupational health and safety</p> <p>4.2 Environmental concerns</p> <p>4.3 Eagerness to learn</p> <p>4.4 Tidiness and timeliness</p> <p>4.5 Respect for rights of peers and seniors in workplace.</p>
5. Resource Implications	<p>The following resources should be provided :</p> <p>5.1 Workplace location.</p> <p>5.2 Tools and equipment appropriate to construction processes.</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>Competency should be assessed by</p> <p>6.1 Workplace observation</p> <p>6.2 Demonstration</p> <p>6.3 Oral Interview</p> <p>6.4 Written examinations</p> <p>6.5 Portfolio</p>
7. Context for Assessment	<p>For certification competency should be assessed individually in the actual work place after completion of the module.</p>

### **Accreditation Requirements**

Training providers must be accredited by Bangladesh Technical Education Board (BTEB) , the national quality assurance body, or a body with delegated authority for quality assurance to conduct training and assessment against this unit of competency for credit towards the award of any national qualification.

Accredited providers assessing against this unit of competency must meet the quality assurance requirements set by BTEB.

## Annexes

### Annex 1. Competency Map for Plumbing in Construction Sector.

OCCUPATION SPECIFIC COMPETENCIES	Fabricate pipes	Prepare pipes for Installation	Make pipe Joints and connections	Perform cutting and penetration works	Install water supply pipe with fittings	Install waste water pipe with fittings
	1	1	1	1	2	2
	Install plumbing fixtures	Conduct pipe leakage testing	Repair and maintenance works for plumbing	Perform plumbing layout	Perform plumbing fixture installation and assemblies	Install hot and potable chilled water piping system.
	2	2	2	3	3	3
	Perform plumbing system installation and assemblies in multi-storied building (up to 6 storied)					
	3					
SECTOR SPECIFIC COMPETENCIES	Work in the construction sector	Interpret drawings and specifications in plumbing manuals	Use hand tools and power tools for plumbing		Perform Measurement and Calculations in Plumbing	Maintain tools and equipment
	1	1	1		2	2
GENERIC COMPETENCIES	Communicate in the workplace	Work in a team environment	Practice workplace cleanliness	Practice occupational health and safety (OHS)	Demonstrate work values	Lead small team
	1	1	1	1	3	3
	Practice negotiation skills					
	3					

## Annex 2. Bangladesh National Qualifications Framework

TVQF Level	Education Type			Current Qualification Structure	Job Classification
	Pre-Voc	VE	TE		
<b>TVQF 6</b>			Diploma	4-year Diploma	Supervisor/Middle Manager/Sub-Assistant Engineer
<b>TVQF 5</b>		**NSC -V		NSS Master	Highly-Skilled Worker/Supervisor
<b>TVQF 4</b>		**NSC - IV		NSS 1/HSC (Voc) Year 11/12	Skilled Worker
<b>TVQF 3</b>		**NSC - III		NSS 2/SSC (Voc) Year 10	Semi-Skilled Worker
<b>TVQF 2</b>		**NSC -II		NSS 3/SSC (Voc) Year 9	Basic Skilled Worker
<b>TVQF 1</b>		**NSC -I		NSS Basic/Basic Trade Course	Basic Worker
<b>Pre-Voc 2</b>	*NPVC - II			None	Pre-Vocational Trainee
<b>Pre-Voc 1</b>	*NPVC -I			None	Pre-Vocational Trainee

\*NPVC – National Pre-Vocational Certificate

\*\*NSC – National Skill Certificate

**Annex 3. Qualification Level Descriptors**

<b>BTVQF Level</b>	<b>Knowledge</b>	<b>Skill</b>	<b>Responsibility</b>	<b>Job Class</b>
6	Comprehensive actual and theoretical knowledge within a specific study area with an awareness of the limits of that knowledge.	Specialised and restricted range of cognitive and practical skills required to provide leadership in the development of creative solutions to defined problems	Manage a team or teams in workplace activities where there is unpredictable change Identify and design learning programs to develop performance of team members	Supervisor/Middle-Level Manager/Sub Assistant Engineer
5	Very broad knowledge of the underlying, concepts, principles, and processes in a specific study area	Very broad range of cognitive and practical skills required to generate solutions to specific problems in one or more study areas.	Take overall responsibility for completion of tasks in work or study Apply past experiences in solving similar problems	Highly Skilled Worker/Supervisor (NSC 4)
4	Broad knowledge of the underlying, concepts, principles, and processes in a specific study area	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	Take responsibility, within reason, for completion of tasks in work or study Apply past experiences in solving similar problems	Skilled Worker
3	Moderately broad knowledge in a specific study area.	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	Work or study under supervision with some autonomy	Semi Skilled worker
2	Basic underpinning knowledge in a specific study area.	Basic skills required to carry out simple tasks	Work or study under indirect supervision in a structured context	Medium Skilled Worker
1	Elementary understanding of the underpinning knowledge in a specific study area.	Limited range of skills required to carry out simple tasks	Work or study under direct supervision in a structured context	Basic Skilled Worker
Pre-Voc 2	Limited general knowledge	Very limited range of skills and use of tools required to carry out simple tasks	Work or study under direct supervision in a well-defined, structured context.	e-Vocation Trainee (NPVC 2)
Pre-Voc 1	Extremely limited general knowledge	Minimal range of skills required to carry out simple tasks	Simple work or study exercises, under direct supervision in a clear, well defined structured context	e-Vocation Trainee (NPVC 1)

**Annex 4. Key for Coding**

Code	Description Occupational Sector
RMG	Ready-Made Garments
LEG	Light Engineering
CON	Construction
INF	Informal Sector Competencies
GC	Generic Competencies
SSC	Sector Specific Competencies
OSC	Occupation Specific Competencies Occupation
PLM	Plumbing
MAS	Masson
PNT	Painter

## Acknowledgments

The Bangladesh Technical Education Board (BTEB) wishes to extend heartfelt thanks and appreciation to the business and industry, academic community and other government agencies who shared their precious time and expertise to the conceptualization, development, validation and finalization of this National Competency Standards.

### The Technical sub committee

Mr. Md. Sobhan  
Bangladesh Association of  
Construction Industry

Md. Abdul Mannan  
Instructor (Civil)  
Kushtia Polytechnic Institute.

Mr. Md. Rahmat  
Bangladesh Association of  
Construction Industry

Mr. Kapaet Ullah  
C.I (Civil), Chittagong Polytechnic  
Institute

Mr. Md. Sayedur Rahman  
Chief Inst.(Civil), Faridpur Polytechnic  
Institute

Md. Mizanur Rahman  
Chief Inst. (Building Maintenance)  
Khagrachori Technical School &  
College

Mr.Md. Rafiqul Islam  
C.I (Architecture), Dhaka Polytechnic  
Institute

Mr. Bikash Chandra Mondal  
Ins. (Civil), Khulna Polytechnic  
Institute

Ms. Anwara Hasina  
Chief Instructor (Civil), Technical  
Teachers Training College

Engr. Abu Yousuf Md. Ferdous  
Industry Coordinator, Skills  
Development Project

**The Industry Skills Council (ISC)**

Shafiqul Alam Bhuiyan  
Managing Director,  
Monico Limited & Chairman of ISC,

Sk. Md. Rafiqul Islam  
Managing Director, GBB Limited &  
Vice-Chairman of ISC

Eng. Aminul Islam  
Managing Director Project Builders  
Limited  
& Member of ISC.

Fakruddin Mobarak Khan  
Secretary, BACI, & Member of ISC.

Eng. Shafiqul Haque Talukdar  
Managing Director, Starlite Services  
Limited  
& Member of ISC.

Eng. Atiqur Rahman  
Managing Director, The Civil  
Engineers Limited  
& Member of ISC.

Eng. Prodip Kumar Shil  
General Manager, The Civil Engineers  
Limited & Member of ISC.

Engr. Jahid Hassan  
Director, Union Development and  
Technologies Ltd.  
& Member of ISC.

Ronjit Kumar  
General Manager, Sagupta N M  
Housing  
& Member of ISC.

Md. Sayedur Rahman  
Chief Instructor, Civil Department,  
Faridpur Polytechnic Institute,  
Faridpur. & Member of ISC.

Eng. Khandakar Golam Mostafa  
Chief Instructor, Civil Department  
Bogra Polytechnic Institute, Bogra  
& Member of ISC.

Eng. Md. Abdul Gofur  
Director (PIU),  
Directorate of Technical Education  
& Member of ISC.

Eng. Aftabuddin Ahmed  
Vice President, BACI & Member of  
ISC.

S.C Ghosh  
Member, Executive Committee, BACI  
& Member of ISC.

Md. Delwar Hossain  
Chief Instructor, Gazipur TSC  
& Member of ISC.

Abdur Rezzak  
Director (Curriculum), (BTEB)  
& Member Secretary of ISC.



**The Review Editing Committee**

Md. Manzurul Alam  
Additional Project Director  
Skills Development Project

Dr. Engr. Md. Abdullah  
Executive Engineer  
Skills Development Project

Engr. Abu Yousuf Md. Ferdous  
Industry Coordinator  
Skills Development Project

Engr. Md. Nuruzzaman Paramanik  
Deputy Director(Finance)  
Skills Development Project

Engr. Md. Ruhul Amin  
Deputy Director(M & E)  
Skills Development Project

**Engr. Ratan Lal Das**  
Chief Instructor, Building Maintenance  
TSC-Maijdee, Noakhali

**Engr. Md. Abu Saleh**  
Chief Instructor (Drafting Civil)  
Barisal Technical School & College

**Engr. Md. Jaynal Abden**  
Chief Instructor(Civil)  
Pabna Polytechnic Institute

## **The Skills Development Project Advisory Team**

**Chowdury Mufad Ahmed**  
Project Director  
Skills Development Project

**Md. Kamal Hossain**  
Additional Project Director  
Skills Development Project

**Dr. Jeoung Keun Lee**  
Team Leader  
Skills Development Project

**Dr. Ligaya Valmonte**  
Curriculum Specialist (International)  
Skills Development Project

**Dr. Mohammad Ali**  
Teacher's Training & Programme Specialist (National)  
Skills Development Project

**Md. Nurul Haque**  
Deputy Director (Training)  
Skills Development Project