



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

National Competency Standards for Plumbing

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

Qualification Code: **CONPLM020112A**



Bangladesh Technical Education Board
July 2013

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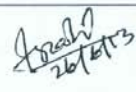

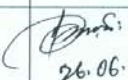

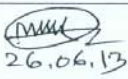

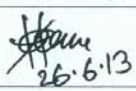

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Approval Sheet


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

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Chairman
On behalf of
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Under the guidance of: **Chowdury Mufad Ahmed**
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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, the 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

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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-I in Plumbing (Construction Sector)	
2. Qualification code:	3. Endorsement date:
CONPLM20112A	10 April 2012
4. Purpose of the qualification	<p>The NSC I in Plumber 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"> 1. Fabricate pipes 2. Prepare pipes for Installation 3. Make pipe joints and connections 4. Perform Cutting and Penetration for plumbing works
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	Chairperson Bangladesh Technical Education Board (BTEB) Agargaon, Sheer-E-Bangla Nagar Dhaka-1207

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) procedures	1	30
GN300512A	Demonstrate work values	3	18
GN300612A	Lead small team	3	18
GN300712A	Practice negotiation skills	3	24
Total			156 hours

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
Total			162

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 work 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 six storied)	3	55
Total			582 hours
Grand Total			900 hours

Course Structure for National Skills Certificate in Plumbing For Level -1

The units of competencies this qualification are summarized as follows:

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) procedures	1	30
Total			96

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
Total			84

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
Total			180
Grand Total			360 hours

Section 3. The Generic Competencies

Unit of Competency	Communicate in the Workplace
Unit Code	GN100112A
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSAs) required to communicate in the workplace. It includes the use of verbal and written forms of communication to receive, interpret, convey, and document information/ instruction using appropriate communication equipment.
Nominal Hours	30 hours

Elements of Competency	Performance Criteria Bold italicized words are detailed in the Range of Variables
1. Receive verbal instructions.	1.1. Instructions are accessed and interpreted. 1.2. Questions are asked to clarify understanding or gain more information. 1.3. Information/instruction is recorded.
2. Interpret verbal and written information/ instruction	2.1. Written instructions are interpreted. 2.2. Work signage 's are properly responded. 2.3. Routine written instructions are followed in sequence. 2.4. Feedback is given to workplace supervisor.
3. Convey instructions using verbal and written forms of communication	3.1. Relevant communication methods are used to transmit instructions. 3.2. Appropriate non-verbal communication is used. 3.3. Channels of communication are identified and followed 3.4. Communication tools and equipment are operated and faults are identified and reported. 3.5. Information is conveyed using appropriate forms .
4. Complete written documentation	4.1. All required documentation is completed 4.2. Workplace data are recorded 4.3. Written information/instruction is passed to personnel.
5. Participate in work place meetings and discussions	5.1. Meetings are attended regularly and on time. 5.2. Meeting inputs are consistent with the meeting purpose and established protocols. 5.3. Opinions are expressed without interruption. 5.4. Meeting outputs are processed and implemented.

Range Of Variables

Variable	Range (Include but not limited to):
1. Written instructions	1.1. Supervisor's/Manager's Instructions 1.2. Memoranda 1.3. Rules and Regulations 1.4. Signage 1.5. Approved Work Plan 1.6. External communications
2. Workplace guidelines	2.1. Labor Policies and Guidelines 2.2. Written Instructions 2.3. Operations Manual 2.4. Organizational Manuals 2.5. Quality Assurance Handbook
3. Signage	3.1. On-site direction signs 3.2. Common site warnings 3.3. Location signs 3.4. Traffic signs
4. Communication	4.1. Verbal instructions 4.2. Written instructions 4.3. Online communication
5. Tools and machinery	5.1. Telephone 5.2. Mobile Phone 5.3. Fax machines 5.4. Two-way radio 5.5. Computers 5.6. Forms 5.7. Memo 5.8. Two-way radio
6. Forms	6.1. Memorandum 6.2. Requisitioning Form 6.3. Personnel Form 6.4. Safety Report Form
7. Documentation	7.1. Reports (Monthly, Quarterly, Half-Yearly, Annual) 7.2. Plans (Strategic Plan, Operational Plan, Monthly Schedule) 7.3. Monitoring and Evaluation Report 7.4. Minutes of Meetings

Evidence Guide

1. Critical Aspects of competency	Assessment required evidence that the candidate: <ul style="list-style-type: none"> 1.1 Demonstrated knowledge of workplace procedures in receiving, interpreting and conveying verbal & written communication. 1.2 Satisfied the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1. Workplace Communication Policies, Standards and Procedures 2.2. Verbal and Non-verbal communication 2.3. Modes of Communication 2.4. Communication Equipment: Types, Uses and Faults 2.5. Channels of Communication
3. Underpinning Skills	<ul style="list-style-type: none"> 3.1. Receiving verbal instructions. 3.2. Interpreting verbal and written information/ instruction 3.3. Conveying instructions using verbal and written forms of communication 3.4. Completing written documentation 3.5. Participating in workplace meetings and discussions
4. Underpinning Attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in workplace
5. Resource Implication	<ul style="list-style-type: none"> 5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials 5.5 Online communication
6. Methods of Assessment	Competency should be assessed by <ul style="list-style-type: none"> 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.

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	Work in a Team Environment
Unit Code	GN100212A
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSAs) required in working in a team environment. It includes the following: identify OHS policies and procedures, follow personal safety measures, report hazards and risks, respond to emergencies, and maintain personal well-being.
Nominal Hours	18 hours

Elements of competency	Performance Criteria <i>Bold italicized</i> words are detailed in the Range of Variables
1. Define team role and scope	1.1. Role and objectives of the team are defined. 1.2. Team structure, responsibilities and reporting relations are identified from team discussions and other external sources.
2. Identify individual role and responsibility	2.1. Individual roles and responsibilities of team members are identified. 2.2. Reporting relationships among team members are defined and clarified. 2.3. Reporting relationships external to the team are defined and clarified.
3. Participate in team discussions	3.1. Ideas related to team plans are contributed. 3.2. Recommendations for improving team work are put forward.
4. Work as a team member	4.1. Effective forms of communication are used to interact with team members. 4.2. Communication channels are followed. 4.3. OHS practices are followed.

Range Of Variables

Variable	Range (Included but not limited to):
1. Sources of information	1.1. Standard Operating Procedures 1.2. Job Description 1.3. Operations Manual 1.4. Organizational Structure

2. Team Members	<ul style="list-style-type: none"> 2.1. Coach/mentor 2.2. Supervisor/Manager 2.3. Peers/Colleagues 2.4. Employee representative
3. Workplace context	<ul style="list-style-type: none"> 3.1. National Laws and Statutes 3.2. Standard Operating Procedures 3.3. Workplace Rules and Regulations

Evidence Guide

1. Critical Aspects of competency	<p>Assessment required evidence that the learner:</p> <ul style="list-style-type: none"> 1.1 Demonstrated knowledge in working in a team environment. 1.2 Satisfied the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1. Team Structure, Role and Responsibility 2.2. Individual Members' Roles and Responsibilities 2.3. Communication Flow and Reporting Structures 2.4. Team Planning 2.5. Interpersonal Communication Skills 2.6. Team Meeting Procedures 2.7. OHS Practices
3. Underpinning skills	<ul style="list-style-type: none"> 3.1. Identifying the role and responsibility of the team 3.2. Identifying roles and responsibilities of individual members 3.3. Participating in team discussions 3.4. Working as a team member
4. Underpinning Attitudes	<ul style="list-style-type: none"> 4.1 Commitment to occupational health and safety 4.2 Environmental concerns 4.3 Eagerness to learn 4.4 Tidiness and timeliness 4.5 Respect for rights of peers and seniors in workplace 4.6 Communication with peers and seniors in Workplace
5. Resource Implication	<ul style="list-style-type: none"> 5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials

	5.5 Online communication
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>Accreditation Requirements</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	Practice Workplace Cleanliness
Unit Code	GN100312A
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSAs) required to Practice Workplace Cleanliness. It includes five steps, namely: sort, systematize, sweep, standardize, and sustain activities.
Nominal Hours	18 hours

Elements of Competency	Performance Criteria Bold italicized words are detailed in the Range of Variables
1. Sort to dispose unnecessary items	1.1. Items in the workplace are identified and differentiated into necessary and unnecessary. 1.2. Unnecessary items are removed and disposed. 1.3. Inventory of necessary items is updated and maintained.
2. Systematize the workplace	2.1. Necessary items are supplied with identification marks and arranged. 2.2. The best location to place the necessary items is identified. 2.3. Necessary items are regularly checked in their assigned location.
3. Sweep the workplace	3.1. The workplace is kept neat, clean and tidy before, during and after work hours. 3.2. Tools and equipment are kept clean. 3.3. Minor repairs are done to tools and equipment, when necessary. 3.4. Defective tools and equipment are reported to proper authorities.
4. Standardize activities	4.1. Workplace activities are done. 4.2. Workplace decorum is maintained. 4.3. Accidents are reported to authority immediately. 4.4. Work is performed.
5. Sustain housekeeping activities	5.1. 5S procedure is implemented. 5.2. Bottlenecks are identified, improvements are recommended, and actions are taken.

Range Of Variables

Variable	Range (Include but not limited to):
1. Unnecessary Items	1.1. Waste materials 1.2. Papers and other printed materials not related to work activities 1.3. Damaged tools and equipment 1.4. Non-recyclable materials
2. Minor repairs	2.1. Sharpening of tools 2.2. Tightening of nuts, bolts and screws 2.3. Replacing of parts 2.4. Application of oil and lubricants
3. Decorum	3.1. Workplace rules and regulations 3.2. Workplace Code of Ethics
4. 5S	A system of work developed in Japan for housekeeping purposes. It consists of: 4.1. Sort 4.2. Systematize 4.3. Sweep 4.4. Standardize 4.5. Sustain

Evidence Guide

1. Critical Aspects of competency	Assessment required evidence that the candidate: 1.1 Followed Evidence of the routine practice of 5S in the workplace. 1.2 Satisfied the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	2.1. Meaning and Application of 5S 2.2. Purposes of 5S 2.3. Methods of Identifying Weaknesses and Recommending Improvements 2.4. Principles of Efficient Workplace
3. Underpinning Skills	3.1. Communicating 3.2. Planning 3.3. Organizing 3.4. Prioritizing 3.5. Recording 3.6. Problem Solving
4. Underpinning Attitudes	4.1 Commitment to occupational health and safety

	<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 Implication	<p>5.1 Pens</p> <p>5.2 Telephone</p> <p>5.3 Computer</p> <p>5.4 Writing materials</p> <p>5.5 Online communication</p>
6. Methods of Assessment	<p>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 examination</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>

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	Practice Occupational Health and Safety (OHS) procedures
Unit Code	GN100412A
Unit Descriptor	This unit covers the knowledge, skills and attitudes (KSAs) required by Practice Occupational Health and Safety (OHS) procedures. It includes the following: identify OHS policies and procedures, follow personal safety measures, report hazards and risks, respond to emergencies, and maintain personal well-being.
Nominal Hours	30 hours

Elements of Competency	Performance Criteria Bold italicized words are detailed in the Range of Variables
1. Identify OHS policies and procedures.	1.1. OHS policies and safe operating procedures are accessed, clarified. 1.2. Safety signs and symbols are identified and followed 1.3. Emergency response, evacuation procedures and other contingency measures are determined . 1.4. Workplace safety conditions are regularly reported to authority.
2. Apply personal health and safety practices	2.1. Personal protective equipment (PPE) and appropriate clothing are worn correctly and stored after use. 2.2. A clear and tidy workplace is maintained. 2.3. OHS equipment is maintained to keep them operational and compliant.
3. Report hazards and risks.	3.1. Hazards and risks are identified, assessed and controlled. 3.2. Terms of tolerable limits are identified 3.3. Incidents arising from hazards and risks are reported to authority 3.4. Details of incidents are recorded.
4. Respond to emergencies	4.1. Alarms and warning devices are responded to. 4.2. Workplace emergency procedures are followed. 4.3. Emergency response plans and procedures are implemented.

5. Maintain personal well-being	5.1. OHS policies and procedures are adhered to. 5.2. OHS awareness programs are participated in. 5.3. Corrective actions are implemented to correct unsafe conditions in the workplace 5.4. “Fit to work” records are updated and maintained.
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Range Of Variables

Variable	Range (Include but not limited to):
1. OHS Policies and Procedures	1.1. Bangladesh standards for OHS 1.2. Building Code 1.3. Fire Safety Rules and Regulations 1.4. Code of Practice 1.5. Industry Guidelines
2. Safe Operating Procedures	2.1. Orientation on emergency exits, fire extinguishers, fire escape, etc. 2.2. Emergency procedures 2.3. First Aid procedures 2.4. Tagging procedures 2.5. Use of PPE 2.6. Safety procedures for hazardous substances
3. Safety Signs and symbols	3.1. Direction signs (exit, emergency exit, etc.) 3.2. First aid signs 3.3. Danger Tags 3.4. Hazard signs 3.5. Safety tags 3.6. Warning signs
4. Personal Protective Equipment (PPE)	4.1. Gas Mask 4.2. Gloves 4.3. Safety boots 4.4. Helmet 4.5. Face mask 4.6. Overalls 4.7. Goggles and safety glasses 4.8. Ear plugs 4.9. Sun block 4.10. Chemical/Gas detectors

5. Hazards	5.1. Chemical hazards 5.2. Biological hazards 5.3. Physical Hazards
6. Emergency Procedures	6.1. Fire fighting 6.2. Medical and first aid 6.3. evacuation
7. "Fit to Work" records	7.1. Medical Certificate every year 7.2. Accident reports, if any

Evidence Guide

1. Critical Aspects of competency	Assessment required evidence that the candidate: 1.1 Demonstrated knowledge in practicing occupational health and safety in the workplace. 1.2 Satisfied the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	2.1. OHS Workplace Policies and Procedures 2.2. Work Safety Procedures 2.3. Emergency Procedures 2.4. Types of Hazards (Biological, Chemical and Physical) and Their Effects 2.5. PPE types and uses 2.6. Personal Hygiene Practices 2.7. OHS Awareness
3. Underpinning Skills	3.1. Identifying OHS policies and procedures 3.2. Following personal work safety practices 3.3. Reporting hazards and risks 3.4. Responding to emergency procedures 3.5. Maintaining physical well-being in the workplace
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	5.1 Pens 5.2 Telephone 5.3 Computer

	5.4 Writing materials 5.5 Online communication
6. Methods of Assessment	Competency should be assessed by 6.1 Workplace observation 6.2 Demonstration 6.3 Oral Interview 6.4 Written examination 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>Accreditation Requirements</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 4. The Sector Specific Competencies

Unit of Competency:	Work in the Construction Sector
Unit Code:	CON100112A
Unit Descriptor:	This unit covers the skills, knowledge and attitude in working in the construction sector. It includes the following steps: describe the organizational structure within the construction sector, identify processes and procedures, identify tools, equipment and materials, identify workplace practices, organize own workload, and practice OHS.
Nominal Hours:	24 hours

Elements of Competency	Performance Criteria Bold italicized words are detailed in the Range of Variables
1. Describe the organizational structure within the sector	1.1. Scope, nature and major fields of the construction sector are determined 1.2. The profile of the construction sector in relation to Bangladesh employment conditions is determined 1.3. Trends and technologies relevant to the sector are explained. 1.4. Relevant policies and guidelines are identified and interpreted. 1.5. Instructions as to procedures in achieving quality are obtained, understood and clarified.
2. Identify processes and procedures	2.1. Construction processes are identified, described and explained. 2.2. Work activities are correctly identified. 2.3. Adjustments are interpreted.
3. Identify tools, equipment and materials	3.1. Appropriate manuals are accessed to ensure up-to-date specifications of tools, materials and equipment. 3.2. Construction tools, materials and equipment are identified. 3.3. Substitutes are identified in case of non-availability.
4. Identify workplace requirements	4.1. Workplace requirements are identified and clarified. 4.2. Roles and responsibilities of all personnel are described. 4.3. Workplace's practices are identified.

	4.4. Problem-solving strategies are used to address bottlenecks, inconsistencies and other concerns.
5. Organize own workload	5.1. Own work activities are planned and progress of work is communicated to relevant staff. 5.2. Work activities are completed. 5.3. Difficulties and bottlenecks are identified, and solutions are put forwarded. 5.4. Own work is monitored against workplace standards and areas for improvement identified and acted upon.
6. Practice OHS	6.1. Relevant OHS practices are identified. 6.2. Relevant OHS practices are interpreted and implemented.

Range of Variables

Variables	Range (Include but not limited to):
1. Major Fields	1.1. Construction Site Support (Dogging, Rigging, etc.) 1.2. Carpentry and Form Works 1.3. Masonry, Brick/Block Laying and Concreting 1.4. Surface Finishing, Tiling and Painting 1.5. Roofing 1.6. Plumbing 1.7. Residential Electrical Wiring and Cabling
2. Employment conditions	2.1. Code of Practice 2.2. Salary/Wage System 2.3. Labor Practices 2.4. Anti-Discrimination Policy 2.5. Gender Issues 2.6. Collective Bargaining and Other Practices 2.7. Awards 2.8. Procedures for Handling Disputes 2.9. Innovations in the Sector
3. Instructions	1.1. Specifications and requirements 1.2. Standard operating procedures 1.3. Manuals of Instruction 1.4. Operations Manual 1.5. Environmental Guidelines 1.6. Gender and Develop Guidelines

4. Manuals	<ul style="list-style-type: none"> 4.1. Manual of Instructions 4.2. Manual of Specifications 4.3. Repair Manual 4.4. Quality Manual 4.5. Maintenance Procedure and Troubleshooting
5. Workplace requirements	<ul style="list-style-type: none"> 5.1. Goals and objectives 5.2. Strategic and Operational Plans 5.3. Systems and Processes 5.4. Monitoring and Evaluation 5.5. Reports and Documentation
6. Tools, equipment and materials	Refers to all tools, equipment and materials appropriate for any of the construction fields
7. Problem-solving strategies	<ul style="list-style-type: none"> 7.1. Asking questions 7.2. Feedback and Feed forward system 7.3. Reference to Standard Operating Procedures 7.4. Accessing Information 7.5. Reviews 7.6. Brainstorming
8. OHS	<ul style="list-style-type: none"> 8.1. Reporting hazards, risks and emergencies 8.2. Arrangement of workplaces 8.3. Standard Operating Procedure 8.4. Workplace environment and safety 8.5. Safe storage of tools and equipment 8.6. Use of PPE

Evidence Guide

1. Critical aspects of competency	<p>The assessment requires evidence that the candidate:</p> <ul style="list-style-type: none"> 1.1 Demonstrated knowledge in working in the Construction sector 1.2 Satisfying all the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	<ul style="list-style-type: none"> 2.1. Scope and Major Divisions of the Construction Sector 2.2. Relevant Policies and Guidelines in the Construction Sector 2.3. Manuals used in the Construction Sector 2.4. Relevant Terminologies and Acronyms 2.5. Types and Uses of Construction Tools and Materials

	2.6. Workplace Practices 2.7. Occupational Health and Safety Practices 2.8. Recording and Reporting practices
3. Underpinning Skills	3.1. Describing the organization structure 3.2. Identifying construction processes and procedures 3.3. Identifying tools, equipment and materials 3.4. Identifying workplace practices 3.5. Organizing own workload 3.6. Practicing OHS
4. Underpinning 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	5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials 5.5 Online communication
6. Methods of Assessment	Competency should be assessed by 6.1 Workplace observation 6.2 Demonstration 6.3 Oral Interview 6.4 Written examination 6.5 Portfolio
7. Context of Assessment	For certification competency should be assessed individually in the actual work place after completion of the module.

Accreditation Requirements

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Unit of Competency:	Interpret Drawings and Specifications in Construction Manuals
Unit Code:	CON10212A
Unit Descriptor:	This unit covers the knowledge, skill and attitude required in interpreting drawings and specifications in construction manuals. It includes the following steps: identify information, identify drawings and specifications, interpret drawings and specifications, and apply occupational health and safety procedures.
Nominal Hours:	30 hours

Elements of Competency	Performance Criteria <i>Bold italicized</i> words are detailed in the Range of Variables
1. Identify information from manuals	1.1. Appropriate manuals are identified and accessed. 1.2. Version and date of the manual are checked to ensure up-to-date specifications of tools, equipment, materials and procedures.
2. Identify drawings and specifications	2.1. Relevant drawings and specifications are correctly identified. 2.2. Terms and abbreviations are identified. 2.3. Signs and symbols are identified
3. Interpret drawings and specifications	3.1. Drawings and specifications are interpreted. 3.2. Schedules, dimensions and specifications contained in the drawings are interpreted.
4. Store manuals	4.1. Documents are collected and packed. 4.2 Documents are stored to prevent damage, and ready access and updating of information when required.

Ranges of Variables

Variable	Range (Include but not limited to):
1. Documents	1.1 Manufacturer's Specification Manual 1.2 Repair Manual 1.3 Maintenance Procedure Manual 1.4 Periodic Maintenance Manual 1.5. Quality Manual

	1.6. Manual of Instruction
2. Drawings	2.1. Technical Drawings 2.2. Sketch
3. Specifications	3.1. Product specifications 3.2. Performance specifications 3.3. Method specifications
4. Instructions	4.1. Orders 4.2. Special Orders
5. Terms and abbreviations	Refers to all terms and abbreviations associated with the construction sector
6. Signs and symbols	Include all signs and symbols associated with the construction sector

Evidence Guide

1. Critical aspects of competency	The assessment requires evidence that the candidate: 1.1 Interpret drawings and specifications in construction documents 1.2. Satisfying the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	2.1 Types of Construction Manuals 2.2 Identification of Signs and Symbols 2.3 Identification of Units of Measurement 2.4 Identification of Units of Conversion 2.5. Drawings and Specifications 2.6. Terms and Abbreviations Used
3. Underpinning skills	3.1. Identifying appropriate manuals 3.2. Identifying drawings and specifications 3.3. Interpreting drawings and specifications 3.4. Storing manuals
4. Underpinning 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	5.1 Pens 5.2 Telephone 5.3 Computer 5.4 Writing materials

	5.5 Online communication
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.

Accreditation Requirements

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Unit of Competency	Use Hand Tools and Power Tools for the Construction Sector
Unit Code	CON100312A
Unit Descriptor	This unit covers the skills, knowledge and attitude in using hand tools and power tools for the construction sector. It includes the following steps: identify tools, use hand tools, use power tools, practice OHS, and clean up.
Nominal Hours	30 hours

Elements of Competency	Performance Criteria
	Bold italicized words are detailed in the Range of Variables
1. Identify tools	1.1. Appropriate tools are selected. 1.2. Applications of tools are defined. 1.3. Hand tools and power tools are prepared. 1.4. Sources of power supply for power tools recognized.
2. Use hand tools	2.1. Appropriate tool is used. 2.2. Proper hand-eye coordination is applied in the use of hand tools. 2.3. Unsafe or faulty tools are identified and marked for repair.
3. Use power tools	3.1. Route for power supply established in accordance with worker safety requirements. 3.2. Proper sequence of operations is applied in using power tools to produce results. 3.3. Power tools are used.
4. Perform basic preventive maintenance.	4.1. Tools and equipment are cleaned. 4.2. Appropriate lubricants are identified. 4.3. Tools and equipment are lubricated. 4.4. Measuring instruments are checked and calibrated. 4.5. Defective instruments, equipment and accessories are inspected and corrected or replaced 4.6. Tools are inspected, repaired and replaced after use. 4.7. The workplace is cleaned and cleared of debris and unwanted materials.

5. Practice OHS	5.1. Waste materials are disposed. 5.2. Hazardous materials are identified for separate handling. 5.3. PPE are used. 5.4. Devices to suppress dust are used. 5.5. Safety requirements are being adhered to before, during and after use. 5.6. Accidents and emergency cases are reported. 5.7. The workplace is cleaned and cleared of debris and unwanted materials.
6. Store tools and equipment	6.1. Inventory of tools equipment are conducted, and recorded as per stock register by using forms . 6.2. Tools and equipment are cleaned and stored safely in appropriate location.

Range of Variables

Variables	Range (Include but not limited to):
1. Tools	1.1. Hand Tools 1.2. Power Tools
2. Applications	2.1. Adjusting 2.2. Aligning 2.3. Assembling 2.4. Boring 2.5. Clamping 2.6. Cleaning 2.7. Cutting 2.8. Dismantling 2.9. Finishing 2.10. Hand sharpening 2.11. Lubricating 2.12. Scraping 2.13. Simple Tool Repairs 2.14. Threading 2.15. Tightening
3. Hand tools	3.1. Adjustable spanners 3.2. Auger bits 3.3. Bars (crow and pitch) 3.4. Bench vise 3.5. Bolt cutters

- 3.6. Brace
- 3.7. C-clamp
- 3.8. Chisels
- 3.9. Crosscut saw
- 3.10. Die and stock
- 3.11. Drill bits
- 3.12. Files of all cross-sectional shapes and types
- 3.13. Gouges
- 3.14. Grin let
- 3.15. Hacksaw
- 3.16. Hammers
- 3.17. Hand drill
- 3.18. Hand saws
- 3.19. Measuring Tapes
- 3.20. Nips
- 3.21. Paint Brushes/Rollers
- 3.22. Picks/Mattocks
- 3.23. Pliers
- 3.24. Plumb bob
- 3.25. Punches
- 3.26. Ripsaw
- 3.27. Scarpers
- 3.28. Screwdrivers
- 3.29. Sealant Gun
- 3.30. Shovel/Spades
- 3.31. Sledge Hammers
- 3.32. Sockets
- 3.33. Spanners and Wrenches
- 3.34. Spatula/Putty Knives
- 3.35. Steel tape measure
- 3.36. String Lines
- 3.37. Taps
- 3.38. Triangle
- 3.39. Trowels and Floats
- 3.40. Try square
- 3.41. Vice grip
- 3.42. Wire Cutters
- 3.43. Wooden Planes

4. Power Tools	<ul style="list-style-type: none"> 4.1. Drills 4.2. Nail guns 4.3. Staplers 4.4. Screw Drivers 4.5. Angle Grinders 4.6. Pneumatic wrenches 4.7. Circular saw 4.8. Grinders 4.9. Jigsaws 4.10. Nibblers 4.11. Cutting saw 4.12. Threading machine 4.13. Sanders 4.14. Planers 4.15. Routers 4.16. Pedestal drills 4.17. Pedestal grinders
5. Instructions	<ul style="list-style-type: none"> 5.1. Manufacturer's Specifications and Instructions for specific tools/equipment 5.2. Workplace orders and instructions 5.3. Work schedule documentation 5.4. Procedures
6. PPE	<ul style="list-style-type: none"> 6.1. Dust mask 6.2. Safety glasses/Goggles 6.3. Gloves 6.4. Safety shoes/boots 6.5. Aprons 6.6. Face masks 6.7. Overalls 6.8. Helmet
7. Forms	<ul style="list-style-type: none"> 7.1. Maintenance schedule forms 7.2. Requisition slip 7.3. Inventory Form 7.4. Inspection Forms 7.5. Procedures



Evidence Guide

1. Critical aspects of competency	Assessment requires evidence that the candidate: 1.1 Demonstrated knowledge in using hand tools and power tools 1.2 Satisfied the requirements mentioned in the Performance Criteria and Range of Variables
2. Underpinning knowledge	2.1. Types of Tools 2.1.1. Hand Tools 2.1.2. Power Tools 2.2. Technical Application of Tools 2.3. Procedures in the Use of Hand Tools and Power Tools 2.4. Policies and procedures for Occupational health and Safety 2.4.1. Use of PPE 2.4.2. Handling of Tools and Equipment 2.4.3. Reporting and Documentation 2.5. Preventive Maintenance 2.5.1. Methods and Techniques 2.5.2. Quality Procedures 2.6. Storage Procedures
3. Underpinning Skills	3.1. Collection of appropriate Tools 3.2. Using Hand Tools Correctly 3.3. Using Power Tools Correctly 3.4. Performing Preventive Maintenance 3.5. Practicing OHS 3.6. Storing tools and equipment 3.7. Cleaning Up
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 Implications	The following resources must be provided 5.1 Adequate workplaces 5.2 Construction materials

	<p>5.3 Tools appropriate to the construction process</p> <p>5.4 Information and documentation</p> <p>5.5 Product specifications</p> <p>5.6 Manual, Codes, Standards and reference materials</p>
6. Method 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>

Accreditation Requirements

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Section 5. The Occupation Specific Competencies

Unit of Competency :	Fabricate Pipes
Unit Code :	CONPLM100112A
Unit Descriptor :	This unit covers the knowledge, skills and attitude required to fabricate pipes. It includes collecting tools, equipment and materials, cutting pipes, threading pipes and installing pipes for plumbing.
Nominal hrs. :	45 hours.

Elements of Competency	Performance Criteria <i>Bold italicized</i> words are detailed in the Range of Variables
1. Practice OHS	1.1 PPE is selected and used. 1.2 Waste materials are disposed. 1.3 Hazardous materials are identified for separate handling. 1.4 Devices to suppress dust are used to minimize health risk of workers. 1.5 Safety requirements are being adhered to before, during and after use. 1.6 Accidents and emergency cases are reported.
2. Collect tools, equipment and materials	2.1 Tools and equipment are selected and collected. 2.2 Size of pipes is chosen. 2.3 Pipes are selected and collected.
3. Cut threads	3.1 Pipes are fixed with Pipe vice . 3.2 Diestocks are adjusted. 3.3 Diestock is rotated in clockwise with equal Pressure. 3.4 Oils are used during operation. 3.5 Thread of pipes is done. 3.6 Thread is checked and adjusted.
4. Cut pipes	4.1 Pipes are marked. 4.2 Pipes are fixed with vice. 4.3 Pipes are cut with tolerance .
5. Set pipes	5.1 Pipes are laid down with a standard slope for joining fittings and fixtures. 5.2 Pipes are jointed. 5.3 Pipes are jointed with fittings & fixtures. 5.4 Pipes are jointed with the fixtures. 5.5 Pipes are installed.

6. Clean the workplace	6.1 Cleaning tools and materials are collected and prepared. 6.2 Used tools & equipment are cleaned. 6.3 Workplace is cleaned. 6.4 Waste materials are disposed.
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Range of Variables

Variable	Range (Include but not limited to):
1. PPE	1.1 Dust mask. 1.2 Goggles. 1.3 Safety shoes. 1.4 Apron. 1.5 Hand Gloves.
2. Tools and Equipment	2.1 Measuring tape. 2.2 Marking Chalk. 2.3 Hacksaw with blade. 2.4 Flat file. 2.5 Adjustable wrench. 2.6 Hammer. 2.7 Chain Wrench
3. Size of pipe	3.1 12 mm dia. 3.2 16mm dia. 3.3 25 mm dia. 3.4 32mm dia. 3.5 40mm dia. 3.6 50mm dia. 3.7 62mm dia. 3.8 75mm dia. 3.9 100 mm dia.
4. Pipes	4.1 G.I. Pipe. 4.2 PVC/uPVC pipe. 4.3 M.S. Pipe. 4.4 C.I. pipe. 4.5 Copper Pipe.
5. Vice	5.1 Table vice. 5.2 Pipe vice.
6. Die stock	6.1 Wrenched diestock. 6.2 Hand diestock.

7. Rotation	7.1 n* 180 degree angle 7.2 n*360 degree angle
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Evidence Guide

1. Critical aspects of competency	The assessment requires evidence that the candidate : 1.1 Selected pipe sizes. 1.2 Cut pipes. 1.3 Threaded Pipes. 1.4 Selected and collected Tools and equipment.
2. Underpinning knowledge	2.1 Identifying Tools Equipment & Materials. 2.2 Interpreting drawing. 2.3 Measurement and calculation. 2.4 Types of thread. 2.5 Types of Joints 2.6 Cleaning Sites
3. Underpinning skills	3.1 Preparing Tools Equipment & materials. 3.2 Recognizing different size of plumbing pipe. 3.3 Using of plumbing hand tools. 3.4 Cutting Thread. 3.5 Installing pipe. 3.6 Cleaning site.
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 Tools and equipment are available. 5.3 Materials relevant to proposed activity. 5.4 Drawing and specifications relevant to the task.
6. Method 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.
<p>Accreditation Requirements</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 Competency :	Prepare Pipes for Installation
Unit Code :	CONPLM100212A
Unit Descriptor :	This unit covers the knowledge, skills and attitude required to prepare pipes for installation. It includes collecting tools, equipment and materials, cutting pipes, threading pipes for plumbing.
Nominal hrs. :	45 hours

Elements Of Competency	Performance Criteria Bold Italicized words are detailed in the Range of Variables
1. Collect tools, equipment and materials	1.1 PPE is selected and used. 1.2 Tools and equipment are selected and collected. 1.3 Size of pipes is chosen. 1.4 Pipes are selected and collected.
2. Cut pipe.	2.1 Pipes are fixed with Pipe vice. 2.2 Pipes are marked. 2.3 Pipes are cut with tolerance .
3. Cut thread on Pipe	3.1 Pipes are fixed with Pipe vice. 3.2 Diestocks are adjusted. 3.3 Diestock is rotated in clockwise with equal Pressure. 3.4 Oils are used during operation. 3.5 Thread is checked and adjusted.
4. Clean the workplace	4.1 Cleaning tools and materials are collected and prepared. 4.2 Used tools & equipment are cleaned. 4.3 Workplace is cleaned. 4.4 Waste materials are disposed.

Range of Variables

Variable	Range (Include but not limited to):
1. Personal protective equipment (PPE)	1.1 Dust mask 1.2 Goggles 1.3 Safety shoes 1.4 Apron 1.5 Gloves

	1.6 Earmuff
2. Tools and equipment	2.1 Pipe vice. 2.2 Pipe cutter. 2.3 Die stock & Die 2.4 Pipe wrench. 2.5 Adjustable wrench. 2.6 Measuring tools. 2.7 Hacksaw with blade.
3. Pipes	3.1 G.I. pipes. 3.2 Plastic pipe.
4. Tolerance	4.1 G.I. Pipes: cut with a ± 3 mm tolerance on its required length. 4.2 PVC/Plastic pipes: cut squarely on its end with a ± 3 mm tolerance.

Evidence Guide

1. Critical aspects of competency	The assessment requires evidence that the candidate : 1.1 Selected and used appropriate processes, tools and equipment to carry out the task. 1.2 Selected materials. 1.3 Identified problems that occur and necessary action to rectify. 1.4 Completed is preparing pipes for installation.
2. Underpinning knowledge	2.1 Pipe measurement. 2.2 Drawing interpretation. 2.3 Materials use and specification. 2.4 Economic use of materials.
3. Underpinning skills.	3.1 Interpreting plans and details. 3.2 Preparing materials. 3.3 Measurement and mathematics skill. 3.4 Using of plumbing hand tools. 3.5 Using lubricants for threading.
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 implications	The following resources should be provided- 5.1 Workplace 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. Method 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

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Unit Competency :	Make Pipe Joints and Connections
Unit Code :	CONPLM100312A
Unit Descriptor :	This unit covers the knowledge, skills and attitude required to make pipe joints and connections. It includes: fitting joints and fitting for PVC/uPVC; performing threaded pipe joints and connection; and caulking joints for plumbing.
Nominal hrs. :	45 hours

Elements Of Competency	Performance Criteria Bold italicized words are detailed in the Range of Variables
1. Collect tools, equipment and materials	1.1 PPE is selected. 1.2 Tools and equipment are selected and collected. 1.3 Size of pipes is chosen. 1.4 Pipes are selected and collected.
2. Make joints and fitting for GI,PVC/uPVC	2.1 Measurements are taken. 2.2 GI, PVC/ uPVC pipes are jointed with strict Adherence. 2.3 GI, PVC/ uPVC pipes joints are selected. 2.4 Pipe ends are cleaned prior to fit-up. 2.5 Trial fitting is performed prior to final fit-up.
3. Perform threaded pipe joints and connection	3.1 Measurements are taken. 3.2 Pipes are laid down. 3.2 Threaded connections are done. 3.3 Teflon tape or other related materials are fitted. 3.4 Tools and equipment are selected.
4. Make joints Leak proof	4.1 Joints are firmly packed with hemp and fitted with molten pig below the rim the hub. 4.2 Lead or epoxy is caulked thoroughly at the Inside and outside edges of the joints. 4.3 Couplers are used to connect pipes and fittings to hub-less pipes.

5. Clean the workplace	<p>5.1 Cleaning tools and materials are collected and prepared.</p> <p>5.2 Used tools & equipment are cleaned.</p> <p>5.3 Workplace is cleaned.</p> <p>5.4 Waste materials are disposed.</p>
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Range of Variables

Variable	Range (Include but not limited to):
1. PPE	<p>1.1 Dust mask</p> <p>1.2 Goggles</p> <p>1.3 Safety shoes</p> <p>1.4 Apron</p> <p>1.5 Gloves</p> <p>1.6 Helmet</p> <p>1.7 Earmuff</p> <p>1.8 Safety Belt</p>
2. Tools and equipment	<p>2.1 Pipe Cutter/hack saw with blade</p> <p>2.2 Hammer</p> <p>2.3 Pipe wrench</p> <p>2.4 Pipe thread Cutter</p> <p>2.5 Pipe vice</p> <p>2.6 Thread cutting machine</p>
3. GI/PVC/uPVC Pipe joints	<p>3.1 T-joint</p> <p>3.2 Y-joint</p> <p>3.3 Cross Tee-joint</p>

Evidence Guide

1. Critical aspects of Competency	Competency assessment requires evidence that the candidate: 1.1 Selected materials in accordance with specification and requirement. 1.2 Fitted-up joint and fittings. 1.3 Performed threaded connections in accordance with specification. 6.1 Caulked joint in accordance with specification and job requirements.
2. Underpinning knowledge	2.1 Measurements. 2.2 Materials use and specification. 2.3 Proper use of plumbing hand tools. 2.4 Economic use of materials. 2.5 Leak proof Joints.
3. Underpinning skills	3.1 Interpreting plans and details. 3.2 Preparing materials. 3.3 Performing pipe joints. 3.4 Using couplers for hub-less pipes. 3.5 Preparing Leak proof joints.
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 implications	The following resources should be provided: 5.1 Workplace 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.
<p>Accreditation Requirements</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 Competency :	Perform Cutting and Penetration for plumbing works
Unit Code :	CONPLM100412A
Unit Descriptor :	This unit covers the knowledge, skills and attitudes to Perform Cutting and Penetration for plumbing works. It includes: cutting wall and floor; and laying out the pipes.
Nominal hrs. :	45 hours

Elements Of Competency	Performance Criteria
	Bold italicized words are detailed in the Range of Variables
1. Cut and Penetration of wall or floor	1.1 <i>PPE</i> are used. 1.2 Pipes Lay-out diagram in wall or floor are completed. 1.3 Cutting walls are made without causing damage to floors/walls and adjacent installations. 1.4 Correct usage of <i>Tools and equipment</i> is observed. 1.5 Cut walls and floor surface restore to original condition.
2. Lay-out pipe	2.1 Work instructions are read and interpreted. 2.2 <i>Materials</i> are collected. 2.3 layouts of pipes are made. 2.4 Work dimension and alignment of work are done.
3. Clean the workplace	3.1 Cleaning tools and materials are collected and prepared. 3.2 Used tools & equipment are cleaned. 3.3 Workplace is cleaned. 3.4 Waste materials are disposed.

Range of Variables

Variable	Range (Included but not limited to)
1. PPE	1.1 Gloves 1.2 Hard hat 1.3 Safety shoes 1.4 Goggles 1.5 Ear Muff

2. Tools and equipment	2.1 Hammer 2.2 Cold chisel 2.3 Saw 2.4 Drill 2.5 Hacksaw 2.6 Pushcart 2.7 Spirit level 2.8 Shovel 2.9 Pointing trowel 2.10 Push pull rule 2.11 Concrete cutter
3. Materials	3.1 Cement 3.2 Sand 3.3 Bricks 3.4 Brick/stone chips

Evidence Guide

1. Critical aspects of competency	Competency assessment requires evidence that the candidate : 1.1 Read and interpreted work instructions according to requirements. 1.2 Selected materials in accordance with specifications and requirements. 1.3 Performed pipe layout. 1.4 Cut walls and floors according to lay-out. 1.5 Demonstrated compliance with safety regulations applicable to work site operations. 1.6 Accurately set out dimensions and alignment of work. 1.7 Identified faults and problems that occur and made necessary action to rectify.
2. Underpinning Knowledge	2.1 Mensuration 2.2 Related drawing reading 2.3 Materials use and specification 2.4 5-S Implementation 2.5 Knowledge on masonry and cement concrete work processes.

3. Underpinning Skills	3.1 Interpreting plan and details. 3.2 Preparing materials. 3.4 Performing basic masonry and cement concrete works. 3.3 Cleaning workplace.
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 Implications	The following resources should be provided : 5.1 Workplace location. 5.2 Tools and equipment appropriate to construction processes. 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 Demonstration 6.2 Oral Interview 6.3 Written examinations 6.4 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.

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 for plumbing 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 six 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 calculation 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		
TVQF 6			Diploma	4-year Diploma	Supervisor/Middle Manager/Sub-Assistant Engineer
TVQF 5		**NSC -V		NSS Master	Highly-Skilled Worker/Supervisor
TVQF 4		**NSC -IV		NSS 1/HSC (Voc) Year 11/12	Skilled Worker
TVQF 3		**NSC -III		NSS 2/SSC (Voc) Year 10	Semi-skilled Worker
TVQF 2		**NSC -II		NSS 3/SSC (Voc) Year 9	Basic Skilled Worker
TVQF 1		**NSC -I		NSS Basic/Basic Trade Course	Basic Worker
Pre-Voc 2	*NPVC -II			None	Pre-Vocational Trainee
Pre-Voc 1	*NPVC -I			None	Pre-Vocational Trainee

*NPVC – National Pre-Vocational Certificate

**NSC – National Skill Certificate

Annex 3. Qualification Level Descriptors

BTVQF Level	Knowledge	Skill	Responsibility	Job Class
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

BTVQF Level	Knowledge	Skill	Responsibility	Job Class
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.	Pre-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	Pre-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

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