



COMPETENCY STANDARD

PLUMBING LEVEL-I

CONSTRUCTION SECTOR



In collaboration with



**NGO FORUM
FOR PUBLIC HEALTH**



In partnership with

Canada

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Foreword

UN High Commissioner for Refugees (UNHCR), in collaboration with International Organization for Migration (IOM), BRAC, Center for Natural Resource Studies (CNRS), and NGO Forum for Public Health, is implementing a skills development project as part of a joint Initiative by International Labour Organization (ILO), UNHCR and BRAC with financial support from Global Affairs Canada (GAC) in the refugee camps of Cox's Bazar and on Bhasan Char.

The project has a target to reach a total of 8,000 refugee youth (18-24) participants for accredited vocational skills training which will be selected across the camps considering the demand of the refugee youths and labour market needs of Rakhine state of Myanmar so that the acquired skills can be utilised after their repatriation. To assess the skills needs of the refugee youths, UNHCR, in collaboration with UCEP Bangladesh, a national pioneer organisation in the vocational skills sector in Bangladesh, commissioned a Skills Needs Assessment in all refugee camps in Cox's Bazar and on Bhasan Char. In alignment with the Skills Needs Assessment findings and commitment, the project developed Competency Standards by adopting Myanmar National Qualification Framework (MNQF) or ASEAN Qualification Reference Framework (AQRF).

Following the requirement of the Myanmar National Qualification Framework (MNQF) or ASEAN Qualification Framework (AQRF), analysing the context of the camps, compatible aptitude and utilisation opportunities for the refugee youth and their educational qualifications, the pool of TVET experts of UCEP Bangladesh has developed course outline of the following ten occupations. Consequently, those ten course outlines have been translated into Competency Standards.

1. Sewing Machine Operation
2. Community Health Worker
3. Concreter
4. Small Engine Mechanic
5. Caregiving
6. Solar (PV) System Installation and Maintenance
7. Electrician (Building)
8. Plumbing
9. Agricultural Crops Production
10. Bakery and Pastry Staff

The following Competency Standard for **Plumbing Level-I** is adapted from the "National Skills Certificate - I in Plumbing, Construction Sector" developed by the Bangladesh Technical Education Board and part of Competency Standard is followed the guidelines of National Skills Standard Authority of Myanmar and Technical Education and Skills Development Authority of the Philippines. Competency standards are benchmarks defining the skills, knowledge and attributes people need to perform a work role.

Qualification Framework Description (Certification System)

To attain the Plumbing Level-I, the candidate must demonstrate competence through assessment covering all the units listed in Section 1. Successful candidates shall be awarded a Certificate of Participation issued jointly by UNHCR and ILO. The qualification of Plumbing Level-I may be attained through the accumulation of Certificates of Competency (COCs) in the following areas:

1. Fabricate Pipes
2. Prepare Pipes for Installation
3. Make Pipe Joints and connections
4. Perform Cutting and Penetration for plumbing works

Successful candidates shall be awarded a Certificate of Participation. Accumulating and submitting all COCs acquired for the relevant units of competency comprising a qualification, an individual shall be issued a Certificate of Participation jointly by UNHCR and ILO to demonstrate the accumulated competencies. The Certificate of Participation may help the person attain the Recognition of Prior Learning (RPL) test in the country of origin or any other third country. Assessment shall focus on the core units of competency. The basic and common units shall be integrated or assessed concurrently with the core units.

General Guidelines for the Assessment

In general, for the competency standard

Method of Assessment:	<ol style="list-style-type: none">1. Interviews/questioning2. Observation3. Demonstration4. Oral/written examination
Context of Assessment:	<ol style="list-style-type: none">1. Training is delivered from camp-based non-registered training centre2. Training materials and the curriculum modules are adopted from MNQF or AQRF3. Training programs are endorsed by the <i>Government of Bangladesh – United Nations Framework on Skills Development for Rohingya Refugee/FDMNs and Host Communities</i>
Information about development and characteristics of the Standard	<p>Course Title: Plumbing Level-I Level: I Nominal Training Duration: 360 Hours</p> <p>This course is designed to enhance the knowledge, desirable skills and attitudes of Plumbing Level-I in accordance with industry standards. It covers Basic, Common and Core Competencies.</p>

Course Structure

Plumbing Level-I

Code	Unit of Competencies	Total Guided Hours		
		Th.	Pr.	Total
Basic Competencies (2 UoCs Required)				
ISEC-CON-PL-01-B	Receive and respond to workplace communication	06	14	20
ISEC-CON-PL-02-B	Follow basic housekeeping procedures	08	22	30
Total in Basic Competencies		14	36	50
Industry Competencies (3 UoCs Required)				
ISEC-CON-PL-01-I	Follow the safety and health procedure	06	24	30
ISEC-CON-PL-02-I	Work in the construction sector	06	24	30
ISEC-CON-PL-03-I	Use Hand Tools and Power Tools	06	24	30
Total in Industry Competencies		18	72	90
Technical Competencies (4 UoCs Required)				
ISEC-CON-PL-01-T	Fabricate Pipes	10	40	50
ISEC-CON-PL-02-T	Prepare Pipes for Installation	10	45	55
ISEC-CON-PL-03-T	Make Pipe Joints and connections	12	45	55
ISEC-CON-PL-04-T	Perform Cutting and Penetration for plumbing works	12	48	60
Total in Technical Competencies		44	178	220
Total Nominal Hours		72	288	360

BASIC COMPETENCIES

- UNIT OF COMPETENCY** : **Receive and respond to workplace communication**
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to receive, respond and act on verbal and written communication.
NOMINAL DURATION : **20 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Follow routine spoken messages	1.1 Required information is gathered by listening attentively and correctly interpreting or understanding information/instructions 1.2 Instructions/information are properly recorded 1.3 Instructions are acted upon immediately in accordance with information received 1.4 Clarification is sought from workplace supervisor on all occasions when any instruction/information is not clear
2. Perform workplace duties following written notices	2.1 Written notices and instructions are read and interpreted correctly in accordance with organizational guidelines 2.2 Routine written instruction are followed in sequence 2.3 Feedback is given to workplace supervisor based on the instructions/information received

RANGE OF VARIABLES

Variable	Range (May include but not limited to)
1. Written notices and instructions	1.1. Handwritten and printed material 1.2. Internal memos 1.3. External communications 1.4. Briefing notes 1.5. General correspondence 1.6. Marketing materials 1.7. Journal articles
2. Organizational Guidelines	2.1 Information documentation procedures 2.2 Company policies and procedures 2.3 Organization manuals 2.4 Service manual

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<ul style="list-style-type: none"> • Knowledge of organizational policies/guidelines in regard to processing internal/external information • Ethical work practices in handling communications • Communication process 	1. Conciseness in receiving and clarifying messages/information/communication 2. Accuracy in recording messages/information
Required major tools and equipment for the UoC: <ol style="list-style-type: none"> 1. Pens 2. Note pads 	

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- UNIT OF COMPETENCY** : **Follow basic housekeeping procedures**
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to apply the basic housekeeping procedures.
NOMINAL DURATION : **30 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Sort and remove unnecessary items	1.1 Reusable, recyclable materials are sorted in accordance with company/office procedures 1.2 Unnecessary items are removed and disposed of in accordance with company or office procedures
2. Arrange items	2.1 Items are arranged in accordance with company/office housekeeping procedures 2.2 Work area is arranged according to job requirements 2.3 Activities are prioritized based on instructions 2.4 Items are provided with clear and visible identification marks based on procedure 2.5 Safety equipment and evacuation passages are kept clear and accessible based on instructions
3. Maintain work area, tools and equipment	3.1 Cleanliness and orderliness of work area is maintained in accordance with company/office procedures 3.2 Tools and equipment are cleaned in accordance with manufacturer's instructions/manual 3.3 Minor repairs are performed on tools and equipment in accordance with manufacturer's instruction/manual 3.4 Defective tools and equipment are reported to immediate supervisor
4. Follow standardized work process and procedures	4.1 Materials for common use are maintained in designated area based on procedures 4.2 Work is performed according to standard work procedures 4.3 Abnormal incidents are reported to immediate supervisor
5. Follow occupational health, safety and environmental requirements	5.1 Work is performed as per instruction 5.2 Company and office decorum are followed and complied with 5.3 Work is performed in accordance with occupational health and safety (OHS) requirements

RANGE OF VARIABLES

Variable	Range (May include but not limited to)
1. Unnecessary items	1.1. Non-recyclable materials 1.2. Unserviceable tools and equipment 1.3. Pictures, posters and other materials not related to work activity 1.4. Waste materials
2. Identification marks	2.1 Labels 2.2 Tags 2.3 Colour coding
3. Decorum	3.1 Company/ office rules and regulations 3.2 Company/ office uniform 3.3 Behaviour
4. Minor repair	4.1 Replacement of parts 4.2 Application of lubricants 4.3 Sharpening of tools 4.4 Tightening of nuts, bolts and screws

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<ul style="list-style-type: none"> • Principles of 5S • Work process and procedures • Safety signs and symbols • General OH&S principles and legislation • Environmental requirements relative to work safety • Accident/Hazard reporting procedures 	<ol style="list-style-type: none"> 1. Basic communication skills 2. Interpersonal skills 3. Reading skills required to interpret instructions 4. Reporting/recording accidents and potential hazards
<p>Required major tools and equipment for the UoC:</p> <ol style="list-style-type: none"> 1. Pens 2. Note pads 3. Marker 4. Colour pens 	

INDUSTRY COMPETENCIES

- UNIT OF COMPETENCY** : **Follow the safety and health procedure**
UNIT DESCRIPTOR : This unit covers the knowledge, skills and attitudes required to perform safety measures effectively and efficiently. It includes identifying areas, tools, materials, time and place in performing safety measures.
NOMINAL DURATION : **30 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Follow safe work practices	1.1 Safety regulations and workplace safety and hazard control practices and procedures based on organization procedures are followed. 1.2 Hazards/ risk in the workplace and their corresponding indicators are identified to minimize or eliminate risk to co-workers, workplace and environment in accordance with organization procedures 1.3 Contingency measures during the events of workplace accidents, fire and other emergencies are complied with in accordance with organization procedures
2. Identify hazards and risks	2.1 Maximum tolerable limits of contaminants based on threshold limit values (TLV) which when exceeded will result in harm or damage to health are identified 2.2 Effects of the hazards are determined. 2.3 OHS issues or concerns and identified workplace hazards are reported to designated personnel in accordance with workplace requirements and relevant OHS legislation
3. Follow emergency procedures	3.1 Follow consistently Occupational Health and Safety (OHS) procedures for controlling hazards/risks in workplace are consistently followed. 3.2 Procedures for dealing with workplace accidents, fire and emergencies are followed in accordance with organization OHS policies 3.3 Personal Protective Equipment (PPE) are correctly used in accordance with organization's OHS procedures

RANGE OF VARIABLES

Variable	Range (May include but not limited to)
1. Safety regulations	1.1. Waste Disposable 1.2. Electrical and Fire Safety precaution 1.3. Signs
2. Hazards	2.1. Chemical 2.2. Electrical 2.3. Falls
3. Risks	3.1. Precaution hazards (use sharp tools) 3.2. Lifeline 3.3. Barricade 3.4. PPE (Masks, Gloves, Boots, Apron, Hat, Eye goggles) 3.5. Signs 3.6. Mask
4. Contingency measures	4.1. Location of first aid kit 4.2. Evacuation 4.3. Agencies contract 4.4. Farm emergency procedures

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<p>Safety Practices</p> <ul style="list-style-type: none"> • Implementation of regulatory controls and policies relative to treatment of area and application of chemicals • Proper disposal of waste materials <p>Codes and Regulations</p> <ul style="list-style-type: none"> • Hazard identification • Emergency procedures <p>Tools & Equipment: Uses and Specification</p> <ul style="list-style-type: none"> • Masks, gloves, boots, overall coats for health protection <p>Maintenance</p> <ul style="list-style-type: none"> • Regular check-up and repair of tools, materials and outfit before and after use 	<ol style="list-style-type: none"> 1. Ability to recognize effective tools, materials, and outfit 2. Ready skills required to read labels, manuals, and other basic safety information
<p>Required major tools and equipment for the UoC:</p> <ol style="list-style-type: none"> 1. Tools, equipment, and outfits appropriate in applying safety measures 	

- UNIT OF COMPETENCY** : **Work in the Construction Sector**
- 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 DURATION** : **30 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated 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.

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ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
6. Follow occupational health, safety (OHS) and environmental requirements	6.1 Relevant OHS practices are identified. 6.2 Relevant OHS practices are interpreted and implemented.

RANGE OF VARIABLES

Variable	Range (May include but not limited to)
1. Major Fields	1.1. Construction Site Support (Dogging, Rigging, etc.) 1.2. Carpentry and Form Works 1.3. Masonry, Brick/Block Laying and Concreting 1.4. Surface Finishing, Tiling and Painting 1.5. Roofing 1.6. Plumbing 1.7. Residential Electrical Wiring and Cabling
2. Employment conditions	2.1. Code of Practice 2.2. Wage System 2.3. Labour Practices 2.4. Gender Issues 2.5. Procedures for Handling Disputes 2.6. Innovations in the Sector
3. Instructions	3.1. Specifications and requirements 3.2. Standard operating procedures 3.3. Manuals of Instruction 3.4. Operations Manual
4. Manuals	4.1. Manual of Instructions 4.2. Manual of Specifications 4.3. Repair Manual 4.4. Quality Manual 4.5. Maintenance Procedure and Troubleshooting
5. Workplace requirements	5.1. Goals and objectives 5.2. Strategic and Operational Plans 5.3. Systems and Processes 5.4. Monitoring and Evaluation 5.5. Reports and Documentation
6. Tools, equipment, and materials	6.1. Refers to all tools, equipment, and materials appropriate for any of the construction fields
7. Problem-solving strategies	7.1. Asking questions 7.2. Feedback and Feed forward system 7.3. Reference to Standard Operating Procedures 7.4. Accessing Information 7.5. Reviews 7.6. Brainstorming
8. OHS	8.1. Reporting hazards, risks, and emergencies 8.2. Arrangement of workplaces 8.3. Standard Operating Procedure 8.4. Workplace environment and safety 8.5. Safe storage of tools and equipment 8.6. Use of PPE

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<ul style="list-style-type: none"> • Scope and Major Divisions of the Construction Sector • Relevant Policies and Guidelines in the Construction Sector • Manuals used in the Construction Sector 	<ol style="list-style-type: none"> 1. Describing the organization structure 2. Identifying construction processes and procedures 3. Identifying tools, equipment, and materials 4. Identifying workplace practices

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<ul style="list-style-type: none">• Relevant Terminologies and Acronyms• Types and Uses of Construction Tools and Materials• Workplace Practices• Occupational Health and Safety Practices• Recording and Reporting practices	<ul style="list-style-type: none">5. Organizing own workload6. Practicing OHS
<p>Required major tools and equipment for the UoC:</p> <ul style="list-style-type: none">1. Pens2. Writing materials3. Computer4. Multi-media projector	

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- UNIT OF COMPETENCY** : **Use Hand Tools and Power Tools**
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 DURATION : **30 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated 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 occupational health, safety (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

Variable	Range (May include but not limited to)
1. Tools	1.1. Hand Tools 1.2. Power Tools
2. Applications	2.1. Adjusting 2.2. Aligning 2.3. Assembling 2.4. 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. Sledgehammers 3.32. Sockets 3.33. Spanners and Wrenches 3.34. Spatula/Putty Knives

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	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	4.1. Drills 4.2. Nail guns 4.3. Angle Grinders 4.4. Pneumatic wrenches 4.5. Circular saw 4.6. Grinders 4.7. Jigsaws 4.8. Nibblers 4.9. Cutting saw 4.10. Threading machine 4.11. Sanders 4.12. Planers 4.13. Routers
5. Instructions	5.1. Manufacturer's Specifications and Instructions for specific tools/equipment 5.2. Workplace orders and instructions 5.3. Work schedule documentation 5.4. Procedures
6. PPE	6.1. Dust mask 6.2. Safety glasses/Goggles 6.3. Gloves 6.4. Safety shoes/boots 6.5. Aprons 6.6. Face masks 6.7. Overalls 6.8. Helmet
7. Forms	7.1. Maintenance schedule forms 7.2. Requisition slip 7.3. Inventory Form 7.4. Inspection Forms 7.5. Procedures

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
Types of Tools <ul style="list-style-type: none"> • Hand Tools • Power Tools Technical Application of Tools Procedures in the Use of Hand Tools and Power Tools	1. Collection of appropriate Tools 2. Using Hand Tools Correctly 3. Using Power Tools Correctly 4. Performing Preventive Maintenance 5. Practicing OHS 6. Storing tools and equipment 7. Cleaning Up

<p>Policies and procedures for Occupational health and Safety</p> <ul style="list-style-type: none">• Use of PPE• Handling of Tools and Equipment• Reporting and Documentation <p>Preventive Maintenance</p> <ul style="list-style-type: none">• Methods and Techniques• Quality Procedures <p>Storage Procedures</p>	
<p>Required major tools and equipment for the UoC:</p> <ol style="list-style-type: none">1. Adequate workplaces2. Construction materials3. Tools appropriate to the construction process4. Information and documentation5. Product specifications6. Manual, Codes, Standards, and reference materials	

TECHNICAL COMPETENCIES

- UNIT OF COMPETENCY** : **Fabricate Pipes**
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 DURATION : **50 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Select and prepare necessary materials	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

RANGE OF VARIABLES

Variable	Range (May 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

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<ul style="list-style-type: none"> • Identifying Tools Equipment & Materials • Interpreting drawing • Measurement and calculation • Types of thread • Types of Joints • Cleaning Sites 	<ol style="list-style-type: none"> 1. Preparing Tools Equipment & materials 2. Recognizing different size of plumbing pipe 3. Using of plumbing hand tools 4. Cutting Thread 5. Installing pipe 6. Cleaning site
<p>Required major tools and equipment for the UoC:</p> <ol style="list-style-type: none"> 1. Workplace location 2. Tools and equipment are available 3. Materials relevant to proposed activity 4. Drawing and specifications relevant to the task 	

- UNIT OF COMPETENCY** : **Prepare Pipes for Installation**
- 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 DURATION** : **55 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated 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 (May include but not limited to)
1. Personal protective equipment (PPE)	1.1. Dust mask 1.2. Goggles 1.3. Safety shoes 1.4. Apron 1.5. Gloves 1.6. 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

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<ul style="list-style-type: none"> • Pipe measurement • Drawing interpretation • Materials use and specification • Economic use of materials 	<ol style="list-style-type: none"> 1. Interpreting plans and details 2. Preparing materials 3. Measurement and mathematics skill 4. Using of plumbing hand tools 5. Using lubricants for threading
<p>Required major tools and equipment for the UoC:</p> <ol style="list-style-type: none"> 1. Workplace location 2. Tools and equipment are available 3. Materials relevant to proposed activity 4. Drawing and specifications relevant to the task 	

- UNIT OF COMPETENCY** : **Make Pipe Joints and Connections**
- 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 DURATION** : **55 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated 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 3.3 Threaded connections are done 3.4 Teflon tape or other related materials are fitted 3.5 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	5.1 Cleaning tools and materials are collected and prepared 5.2 Used tools & equipment are cleaned 5.3 Workplace is cleaned 5.4 Waste materials are disposed

RANGE OF VARIABLES

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

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<ul style="list-style-type: none"> • Measurements • Materials use and specification • Proper use of plumbing hand tools • Economic use of materials • Leak proof Joints 	1. Interpreting plans and details 2. Preparing materials 3. Performing pipe joints 4. Using couplers for hub-less pipes 5. Preparing Leak proof joints
Required major tools and equipment for the UoC: <ol style="list-style-type: none"> 1. Workplace location 2. Tools and equipment are available 3. Materials relevant to proposed activity 4. Drawing and specifications relevant to the task 	

- UNIT OF COMPETENCY** : **Perform Cutting and Penetration for plumbing works**
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 DURATION : **60 Hours**

ELEMENT	PERFORMANCE CRITERIA <i>Italicized terms</i> are elaborated in the Range of Variables
1. Cut and Penetration of wall or floor	1.1 PPE 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 Tools and equipment 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 Materials 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 (May include but not limited to)
1. Personal protective equipment (PPE)	1.1. Gloves 1.2. Hard hat 1.3. Safety shoes 1.4. Goggles 1.5. Earmuff
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

Underpinning Knowledge (To be used as training content in the information sheet of CBLM)	Underpinning Skills (to be used as job in the job sheet of CBLM)
<ul style="list-style-type: none"> • Mensuration • Related drawing reading • Materials use and specification • 5-S Implementation • Knowledge on masonry and cement concrete work processes. 	<ol style="list-style-type: none"> 1. Interpreting plan and details 2. Preparing materials 3. Performing basic masonry and cement concrete works 4. Cleaning workplace
<p>Required major tools and equipment for the UoC:</p> <ol style="list-style-type: none"> 1. Workplace location 2. Tools and equipment appropriate to construction processes 3. Materials relevant to the proposed activity 4. Drawings and specifications relevant to the task 	