



Model Curriculum

QP Name: Plumbing Site Engineer

QP Code: PSC/Q0115

QP Version: 2.0

NSQF Level: 6

Model Curriculum Version: 1.0

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Training Parameters

Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance
Country	India
NSQF Level	5.5
Aligned to NCO/ISCO/ISIC Code	NCO-2015/ 2142.0301
Minimum Educational Qualification and Experience	<p>Pursuing 4th year UG (in case of 4-year UG with honors/ honors with research) (Civil Engineering or Mechanical Engineering) OR Completed 3-year UG degree program after 12th (Civil Engineering or Mechanical Engineering) OR Pursuing PG diploma after 3-year UG degree (Civil Engineering or Mechanical Engineering) OR Previous relevant Qualification of NSQF Level (5 as Plumbing Supervisor) with 3 Years of experience Relevant</p>
Pre-Requisite License or Training	NA
Minimum Job Entry Age	21 years
Last Reviewed On	28/02/2023
Next Review Date	28/02/2026
NSQC Approval Date	
QP Version	2.0
Model Curriculum Creation Date	28/02/2023
Model Curriculum Valid Up to Date	28/02/2026
Model Curriculum Version	1.0
Minimum Duration of the Course	630 Hours
Maximum Duration of the Course	630 Hours

Program Overview

This section summarizes the end objectives of the program along with its duration.

Training Outcomes

At the end of the program, the learner should have acquired the listed knowledge and skills.

- Demonstrate the planning and scheduling activities for a plumbing project
- Perform the steps involved in Initiating the project
- Demonstrate the tasks performed to ensure timely completion of a plumbing project as per plan
- Demonstrate the steps involved in handing over of plumbing project
- Apply appropriate health and safety practices at the workplace
- Discuss the importance of working effectively with others
- Discuss the Employability and Entrepreneurship Skills

Compulsory Modules

The table lists the modules and their duration corresponding to the Compulsory NOS of the QP.

NOS and Module Details	Theory Duration	Practical Duration	On-the-Job Training Duration (Mandatory)	On-the-Job Training Duration (Recommended)	Total Duration
PSC/N0156: Plan and Initiate a Plumbing Project NOS Version No.: 1.0 NSQF Level: 5.5	75:00 Hours	180:00 Hours	15:00 Hours	00:00 Hours	270:00 Hours
Module 1: Introduction to the sector and the job role	05:00 Hours	00:00 Hours	00:00 Hours	00:00 Hours	05:00 Hours
Module 2: Water Supply Systems	07:00 Hours	00:00 Hours	02:00 Hours	00:00 Hours	09:00 Hours
Module 3: Drainage and waste-water disposal systems	07:00 Hours	00:00 Hours	02:00 Hours	00:00 Hours	09:00 Hours
Module 4: Plumbing fixtures	07:00 Hours	00:00 Hours	02:00 Hours	00:00 Hours	09:00 Hours
Module 5: Specialized plumbing	07:00 Hours	00:00 Hours	02:00 Hours	00:00 Hours	09:00 Hours
Module 6: Basics of Plumbing Projects	07:00 Hours	00:00 Hours	02:00 Hours	00:00 Hours	09:00 Hours
Module 7: Identifying requirements	07:00 Hours	50:00 Hours	02:00 Hours	00:00 Hours	59:00 Hours

Module 8: Facilitating design	07:00 Hours	50:00 Hours	01:00 Hours	00:00 Hours	58:00 Hours
Module 9: Project planning	07:00 Hours	50:00 Hours	01:00 Hours	00:00 Hours	58:00 Hours
Module 10: Organizing for materials, equipment and manpower	07:00 Hours	15:00 Hours	01:00 Hours	00:00 Hours	23:00 Hours
Module 11: Initiating project	07:00 Hours	15:00 Hours	00:00 Hours	00:00 Hours	22:00 Hours
PSC/N0157: Monitor Work at a Plumbing Worksite NOS Version No.: 1.0 NSQF Level: 5.5	75:00 Hours	210:00 Hours	15:00 Hours	00:00 Hours	300:00 Hours
Module 12: Inspection process	20:00 Hours	60:00 Hours	04:00 Hours	00:00 Hours	84:00 Hours
Module 13: Taking corrective action	20:00 Hours	60:00 Hours	04:00 Hours	00:00 Hours	84:00 Hours
Module 14: Stakeholder engagement and liaison	20:00 Hours	50:00 Hours	04:00 Hours	00:00 Hours	74:00 Hours
Module 15: Commissioning the project	15:00 Hours	40:00 Hours	03:00 Hours	00:00 Hours	58:00 Hours
PSC/N0136: Apply health and safety practices at the workplace NOS Version No.: 1.0 NSQF Level: 4	05:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	15:00 Hours
Module 16: Health and safety	05:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	15:00 Hours
PSC/N0138: Implement Measures to Work Effectively NOS Version No.: 1.0 NSQF Level: 5	05:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	15:00 Hours
Module 17: Team effectiveness	05:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	15:00 Hours
DGT/VSQ/N0101: Employability Skills (30 Hours) NOS Version No.: 1.0 NSQF Level: 3	20:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Module 18: Employability Skills	20:00 Hours	10:00 Hours	00:00 Hours	00:00 Hours	30:00 Hours
Total Duration	180:00 Hours	420:00 Hours	30:00 Hours	00:00 Hours	630:00 Hours

Module Details

Module 1: Introduction to the sector and the job role

Bridge Module

Terminal Outcomes:

- Explain the importance of plumbing industry.
- List the key responsibilities of a Site Engineer for plumbing projects.

Duration: 05:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Outline the overview of the plumbing industry. • Discuss the scope of employment in the contracting segment of the industry. • List the key responsibilities of a Site Engineer. 	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Nil	

Module 2: Water supply and distribution systems

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Describe various water supply and distribution systems, their plumbing, design, fabrication and installation requirements.

Duration: 07:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Describe the type of water and sources of water supply to domestic and commercial establishments. Perform water supply requirement calculations for domestic and commercial establishments. Identify the various components of the water storage and distribution systems in domestic and commercial establishments. Describe the plumbing requirements for hot water distribution systems. Describe the various types and grades of pipes, fittings, and materials used in water supply and distribution plumbing systems and their advantages and disadvantages. Describe the various pumps used in water storage and distribution systems and the key considerations for their selection. Explain the various design concepts for water supply and distribution plumbing systems. Discuss the various fabrication and installation techniques used in water supply and distribution plumbing systems and their applications and precautions. Explain the application, advantages and disadvantages of various types of tools and equipment used in the installation of water supply and distribution plumbing systems. Explain the use and types of Ring Main Units. Explain the Pressure Estimation process Explain the use of booster pump and related equipment. Outline the use of hydro pneumatic system like Pressure Vessel, VFD, Pressure Switches etc Describe the pump room design layout in brief. 	

- Describe the PRS/PRV system along with zoning and conventional methods.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

A water supply and distribution system, pipes, fittings, materials, pumps, tools and equipment used in water supply and distribution plumbing systems.

Module 3: Drainage and waste-water disposal systems

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Describe various drainage and waste-water disposal systems, their plumbing, design, fabrication and installation requirements.

Duration: 07:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> List the type of wastes in domestic and commercial establishments that require plumbing systems. Identify the various components of the drainage and waste-water disposal systems in domestic and commercial establishments. Describe the various types and grades of pipes, fittings, and materials used in the drainage and waste-water disposal plumbing and their advantages and disadvantages. Describe the various pumps used in drainage and waste-water disposal systems and the key considerations for their selection. Explain the various design concepts for the drainage and waste-water disposal plumbing systems. Discuss the various fabrication techniques used in the drainage and waste-water disposal plumbing systems and their applications and precautions. Explain the application, advantages and disadvantages of various types of tools and equipment used in the installation of drainage and waste-water disposal plumbing systems. Describe various sewage pipe laying methods both, internal and external, such as sunken slab, fall ceiling with minimum sunk, 2pipe system, anti-siphonage system etc Explain key concepts of manholes, gully trap and the slopes standards to be considered while using PVC/HDPE/SWG/RCC etc Describe the types and working of sewage treatment plants. 	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	

A drainage and waste-water disposal system, pipes, fittings, materials, pumps, tools and equipment used in drainage and waste-water disposal plumbing systems.

Module 4: Plumbing fixtures

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Describe various plumbing fixtures, their plumbing requirements
- Explain the factors to be considered while selecting the appropriate fixtures

Duration: 07:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the various types of fixtures and the materials and finishes used in them. • Describe the plumbing requirements for various fixtures. • Explain the factors to be considered while selecting the appropriate fixtures for residential and commercial establishments. 	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Various types of fixtures of different types of materials and finishes. Properly installed fixtures.	

Module 5: Specialised plumbing

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Describe various types of specialised plumbing that a commonly used.

Duration: 07:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> Describe the specialised plumbing requirements for rainwater disposal and harvesting systems. Describe the specialised plumbing requirements for fixtures for toilets for disabled. Describe the specialised plumbing requirements for fire suppression systems. Describe the specialised plumbing requirements for multi-storey buildings and hotels. Describe the specialised plumbing requirements for fuel-gas supply. Describe the specialised plumbing requirements for hospitals and laboratories. Describe the specialised plumbing requirements for factories. Describe the specialised plumbing requirements for water and waste treatment plants. Explain the concepts of recharge pits. Describe the external area drainage system such as landscaping and parking area Describe the information available in NFPA Tables and their use 	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Properly installed rainwater disposal and harvesting systems, fixtures for toilets for disabled, fire suppression systems, multi-storey buildings and hotels, fuel-gas supply, hospitals and laboratories, factories and water and waste treatment plants.	

Module 6: Basics of Plumbing Projects

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Describe various types of plumbing projects.
- Describe the key stakeholders and activities involved in plumbing projects

Duration: 07:00	Duration: 00:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the types of plumbing projects. • State the roles and responsibilities of various key personal involved in plumbing projects. • Discuss the Mechanical, Electrical and Plumbing (MEP) activities being performed for plumbing projects and their sequence. 	
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Sites visit to a few types of plumbing project sites.	

Module 7: Identifying requirements

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Extract and compile information of requirements of the plumbing project from stakeholder inputs, contract document and existing drawings and plans.

Duration: 07:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • List the various types of drawings, blueprints, designs, contractual documents and plans associated with plumbing projects, their purpose. • Describe the information required for identifying requirements that can be extracted from the drawings, blueprints, designs, contractual documents and plans associated with plumbing projects • Explain relevant NFPA, NEPA, NBC standards for fire and plumbing installations. • Discuss techniques to evaluate the existing design of buildings. 	<ul style="list-style-type: none"> • Analyse a sample set of stakeholders' inputs and plumbing contract and drawings to prepare a compilation of objectives and considerations for a plumbing project plan • Extract relevant information from a sample set of client briefing and technical inputs.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Sample drawings, blueprints, designs, contractual documents, plans and set of stakeholders' inputs, client briefing and technical inputs for plumbing projects.	

Module 8: Facilitating design

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Demonstrate the process of surveying a site
- Prepare design basis report (DBR) based on site survey findings

Duration: 07:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the purpose and process of site survey for project strategy and design. • Reproduce a site survey checklist. • Explain the importance of communicating the inputs obtained through site surveys to the designers and management for modifications • Explain the purpose and key elements of design basis report (DBR) for facilitating the project design. • State the kind of site related information that could provide technical support to architects, design engineers and experts to strengthen the designs. 	<ul style="list-style-type: none"> • Demonstrate the process of surveying a site to identify impact of local conditions on project strategy and design. • Prepare a sample design basis report (DBR) based on the site survey findings.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
A site where the plumbing work must be done for site survey, sample design basis report	

Module 9: Project planning

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Demonstrate the various steps involved in preparing a plumbing project plan.

Duration: 07:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the essentials of project planning such as objectives, scope, schedule, budget, requirements, quality criteria, stakeholder list, project resources, procurement strategy, project constraints, risk management, communications plan and tools for planning and scheduling. • Describe the key features of plumbing project plans. • State the steps involved in preparing estimations, costing and budget reports. • Explain the measurements and hydraulic calculations for planning for plumbing and fire protection systems. • Explain the importance of accuracy in identification of measurements and calculations with respect to plumbing work. • Discuss the factors that help to calculate the timelines, quantity materials required and costs involved. • Explain the steps involved in estimating manpower requirements and their costing, based on the work plan • List some constraints that commonly impact the planning for a plumbing project. • Discuss optimal solutions for technical problems envisaged during plumbing tasks. • Discuss best practices for planning a strategy for completion of plumbing project within the given budgets and constraints. • before finalising plan. • Explain the importance of obtaining approval from authority for the plan and schedule before finalizing it. • Describe quality assurance/quality control (QA) (QC) measures at a plumbing site. • Clarify the QA QC duties as per Municipal Accounting Manual (MAM) 	<ul style="list-style-type: none"> • Demonstrate the process of extraction of relevant information from a sample plumbing project design and specifications. • Carry out measurements and hydraulic calculations to identify the required equipment and materials for a plumbing project. • Demonstrate how to estimate manpower requirements based on the work plan. • Demonstrate how to adjust timelines, costs and quantity of materials in line with modifications made in the design. • Carry out standard estimations and costing for a plumbing project and prepare a budget report based on the same. • Prepare a sample schedule of tasks to be performed for a plumbing project

- List the workplace safety requirements and the health and safety hazards at the workplace.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Storekeeping resources (such as storage media, logbooks, entry registers, Microsoft Excel etc.); plumbing materials, tools and equipment; product catalogues, relevant project documents and client briefings, plumbing products based on type, grades and specifications; pipes, fittings, joints, accessories and related hardware; plumbing tools and equipment; lubricants and chemicals used in plumbing work.

Module 10: Organising for materials, equipment and manpower

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Demonstrate the processes involved in organising for materials, equipment and manpower for a plumbing project.

Duration: 07:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the importance of timely delivery of materials to the site. • Describe the procurement and contracting needs of project and site. • Discuss some good practices for identifying potential suppliers and contractors for sourcing manpower, equipment and material at the work site. • State common steps involved in requisitioning process for ordering tools, equipment and supplies in various organisations. • Discuss the essentials of the ordering process for tools, equipment and supplies as required for the project. • Examine some negotiation techniques that can be used to agree a price with vendors. • State the areas where a site engineer could be required for facilitating the contracting for manpower supply as per requirement. • Explain the importance of following up with vendors for material delivery as per standard operating procedure (SOP). • Discuss common stockroom processes. • Elucidate key considerations to be kept in mind while verifying suppliers' and contractors' bills. 	<ul style="list-style-type: none"> • Dramatize the negotiation techniques that can be used to agree a price with vendors. • Demonstrate the various stockroom process adopted to ensure adequate stock of equipment and supplies in the stockroom. • Perform verification of sample contractors' and suppliers' bills for manpower, equipment and materials
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Sample contracts for suppliers and contractors, sample requisitioning and ordering documentation, a stocked stockroom with complete documentation of various stockroom processes.	

Module 11: Initiating project

Mapped to PSC/N0156, v 1.0

Terminal Outcomes:

- Perform the site preparation activities at a plumbing project site.
- Demonstrate the activities involved in work allocation

Duration: 07:00	Duration: 15:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Describe the plumbing site preparation activities. • List the various facilities that are required at plumbing sites such as water, electricity, toolrooms and washrooms, and how to organise for them. • Explain the purpose of work schedules, work plans, charts, work bulletins and memos generally prepared to initiate work for a project. • Explain the importance of proper handover of all the project documents to the supervisor prior to starting the work. 	<ul style="list-style-type: none"> • Demonstrate the various preparatory activities for the site including setting boundaries and signage, clearing waste and hazards, levelling the area, etc. • Show how to prepare site diaries and work allocation sheets for the project undertaken. • Demonstrate the preparation of detailed work plans based on sample project plan provided. • Dramatize the steps involved in allocation of work and providing instructions to the team. • Demonstrate the implementation of various quality assurance/quality control (QA)/(QC) measures for activities/items mentioned in a project plan.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
A site where a plumbing project must be initiated	

Module 12: Inspection process

Mapped to PSC/N0157, v 1.0

Terminal Outcomes:

- Perform various checks to monitor the progress and quality of work

Duration: 20:00	Duration: 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the objectives of inspection a plumbing project execution. • State key considerations to be taken while inspecting. • Describe the procedure to be followed to inspect buildings for proper functioning of fire protection and plumbing installations. • State the challenges faced while inspecting multiple plumbing sites as per the proposed timeframe. • List the key considerations to review the specifications of the materials. • Explain the importance of accuracy in identification of measurements and calculations with respect to plumbing work. • Explain the steps involved in checking site plans, drawings and quantities for accuracy of calculations. • Discuss the key considerations to review the specifications of the materials. • Describe the methods to analyse material consumption and ensure minimal wastage. • Describe the process of documentation to be followed for the plumbing project. • State various techniques to dispose the scrap generated during plumbing tasks. • State proper storage procedure for materials and equipment relevant to the project. • Describe the quality inspection process. • Describe the joint measurement process. • List the steps in the procedure to be followed to inspect buildings for plumbing requirements. • State the required pressure, flow and temperature of water at different outlets. • Describe the techniques to dispose the scrap generated during plumbing tasks. 	<ul style="list-style-type: none"> • Demonstrate the processes of tracking the work under progress at a site as per calculations, layouts and schematic mark-ups defined. • Conduct a check of plans, drawings and quantities for accuracy of calculations relevant to the project. • Perform a check whether the piping installations and fixtures are in adherence to project drawing and specifications. • Perform a check to ensure that the materials being used, and work performed is in accordance with the required specifications. • Observe the material consumption to identify if there has wastage is happening. • Check if the documentation for materials stocking and consumption is being properly maintained at the work site. • Carry out a comparison of the work completed with the milestones defined in the project plan. • Perform a check whether the tools, equipment and materials are stored as per manufacturer's instructions. • Conduct an inspection of the quality of products that are being received at the work site. • Perform a quality inspection, joint measurement and billing for running account (RA) of an ongoing project. • Inspect all the installed systems for proper functioning. • Perform a check to ensure that the scrap generated during work activities is disposed in a timely and industry prescribed manner. • Perform a check if the workforce adheres to health and safety (HSE) norms at the work site.

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| <ul style="list-style-type: none"> • Explain the process of documentation to be followed for the plumbing project inspection. • Describe how to record the status of work being performed at the worksite. • Explain the importance of reporting the work progress and requirements to the project managers, project engineers, contractors etc. | <ul style="list-style-type: none"> • Demonstrate the preparation of a log related to day-to-day execution and planning of work and resources. |
|---|--|

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

A site where a plumbing project work is in progress

Module 13: Taking corrective action

Mapped to PSC/N0157, v 1.0

Terminal Outcomes:

- Demonstrate the various corrective actions that can be taken to remedy any delay or discrepancy in the progress of the plumbing project.

Duration: 20:00	Duration: 60:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • typical issues or faults that can arise during inspection and commissioning exercise • methodology to rectify the issues that can arise during inspection and commissioning exercise • Discuss common problems that cause delay and discrepancies in a plumbing project fulfilment and possible corrective measures and work arounds. • Suggest remedies for technical problems provided. • Explain the importance of consulting with team for possible remedies. 	<ul style="list-style-type: none"> • Evaluate the reason of delay and discrepancies from plan based on inspection report. • Demonstrate the modification of the work plan to incorporate corrective actions. • Dramatize the situation of providing instructions to team about the changes in plan.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Sample work inspection reports and work plans	

Module 14: Stakeholder engagement and liaison

Mapped to PSC/N0157, v 1.0

Terminal Outcomes:

- Describe various plumbing fixtures, their plumbing requirements
- Explain the factors to be considered while selecting the appropriate fixtures

Duration: 20:00	Duration: 50:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the importance of effective engagement with stakeholders. • State the internal and external stakeholders in a plumbing project and their roles and requirements. • Discuss the liaising requirements for plumbing projects. • Explain the importance of keeping clients and their representatives informed about the work progress and deviations from plan and their reasons 	<ul style="list-style-type: none"> • Roleplay liaising with project consultants, subcontractors, supervisors, planners, quantity surveyors and general workforce for resolving routine problems. • Role-play liaising with the procurement department to ensure that there are adequate resources present at the worksite • Role-play liaising with the local authority to ensure compliance with local regulations and by-laws.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
Nil	

Module 15: Commissioning the project

Mapped to PSC/N0157, v 1.0

Terminal Outcomes:

- Describe various plumbing fixtures, their plumbing requirements
- Explain the factors to be considered while selecting the appropriate fixtures

Duration: 15:00	Duration: 40:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Explain the commissioning process. • List the various types of defects in plumbing installations such as leakages, improper alignment, etc • Describe the tests used to check for proper installation and functioning of plumbing systems. • Elaborate on the importance of coordinating with civil team, finishing team, mechanical electrical plumbing (MEP) design team, consultant, and contractor for the clearances. 	<ul style="list-style-type: none"> • Test installed plumbing systems for proper functioning • Test installed plumbing systems for leakages and/or damages • Check the pressure and characteristic of water flow in just installed system. • Demonstrate how to identify and rectify any anomalies which arise during commissioning exercise. • Dramatize the training of owner's staff in equipment maintenance and systems operation. • Show how to guide the plumbing team in conducting the handover exercise. • Prepare a sample handover documentation and project completion report.
Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	
Tools, Equipment and Other Requirements	
A ready for commissioning plumbing installation site.	

Module 16: Health and safety

Mapped to PSC/N0136, v 1.0

Terminal Outcomes:

- Describe the various risks and hazards at the workplace and their preventive and corrective measures
- Employ preventive and corrective measures to protect self and others from common workplace hazards and risk

Duration: 05:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Differentiate between risks and hazards. • Discuss the specific safety and health related problems faced in domestic, commercial and institutional setups. • List the various types of hazards (such as physical, fire, chemical compounds and electrical) that could affect the work process. • List the various hazardous environments and common hazards that can occur during plumbing installation and maintenance along with their precautions and remedial measures. • Discuss the importance of various types of personal protective equipment (PPE). • Discuss where the general health and safety equipment commonly is kept at the workplace. • Explain the various types of safety signs and their significance in the work process. • Discuss various causes of fire and precautionary activities to prevent the fire accident. • List the different techniques that employ various methods (such as using extinguishers, water hose, sprinklers, sand bucket, wet blanket, etc.) and materials such as water, powder, foam, CO₂, fire extinguishing chemical, sand, blanket, etc. used for extinguishing fire as per the type (as per class A, B, C and D). • Describe rescue techniques applied during a fire hazard or electrocution. • Discuss appropriate basic first aid treatment relevant to the condition e.g., shock, electrical shock, bleeding, minor burns, poisoning, eye injuries etc. 	<ul style="list-style-type: none"> • Perform inspection of a work area to identify risks and hazards. • Apply various health and safety precautions to be taken during plumbing work. • Apply personal and workspace hygiene and sanitation practices. • Dramatize workplace emergency and evacuation procedures using role plays. • Demonstrate the correct use of fire extinguishers. • Dramatize, using role play, safe methods of freeing a person from electrocution. • Perform appropriate first aid treatment for various conditions such as bleeding, burns, choking, electric shock and poisoning and injury. • Demonstrate the process of providing cardiopulmonary resuscitation (CPR).

- Discuss potential injuries and health problems associated with incorrect handling of tools and equipment.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Personal protective equipment (such as eye protector, hard hats, safety belts, gloves, protective clothing), plumbing tools and materials, power tools, required machinery, fire extinguisher, first aid kit.

Module 17: Team Effectiveness

Mapped to PSC/N0138, v 1.0

Terminal Outcomes:

- Apply effective communication techniques with team and stakeholders.
- Describe approaches to handle queries, concerns and welfare of workers.
- Role play a situation on how to demonstrate behaviours indicating respect for all genders and PwD.

Duration: 05:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • State the importance of effective communication in the workplace and the impact of poor communication on any employee, employer and customer. • List various components of effective communication. • State the advantages and disadvantages of various modes of communication. • State the importance of teamwork in organizational and individual success. • Describe the group dynamics and processes • List the common reasons for interpersonal conflict and ways of managing it effectively. • Discuss the possible ways to deal with grievances and problems appropriately and effectively • Explain the concept of goal setting and its importance for self and team. • State common measures that can be implemented at a plumbing work site to improve workplace productivity and team effectiveness. • Discuss the importance of adhering to legislation, standards, policies, and procedures relevant to own employment and performance conditions. • Discuss types of unacceptable behaviour • Explain the importance of ethics and discipline for professional success • Explain the impact of gender, disability, cultural and age-related biases, stereotyping at the workplace and in society. • State the laws, acts, provisions and schemes defined for PwD and against sexual harassment of women in workplace by the Government bodies. 	<ul style="list-style-type: none"> • Dramatize situations showing good practices for handling worker complaints and concerns. • Dramatize the process of dealing with conflicts among team members. • Demonstrate the various administrative duties and personnel duties. • Demonstrate the use of inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive. • Dramatize the use of appropriate tone, pitch and language to convey politeness, assertiveness, care, professionalism and a non-biased attitude. • Demonstrate practices to eliminate personal bias based on gender, disability, caste, religion, colour, sexual orientation and culture from routine transactions. • Demonstrate how to give feedback on individual work performance to each team member for improvement in work quality. • Demonstrate the best practices for training of workers on performing various plumbing tasks correctly.

- Discuss basic gender concepts such as gender power relations, gender roles, access and control, gender sensitivity, gender equity and equality.
- Discuss the importance of gender sensitivity and equality.
- Discuss indicators of harassment and discrimination based on gender, disability, caste, religion, colour, sexual orientation and culture at workplace.
- State general organisational norms and procedures applied to protect against harassment and discrimination.
- Discuss the importance of reporting incidents of harassment and discrimination to appropriate authority.
- List common causes for lag in performance of the plumbing team as well as possible solutions to bridge the gap.
- Explain the importance of providing feedback on individual work performance to each team member for improvement in work quality.
- Explain the importance of training the workers involved in plumbing installation.
- State basic considerations while training the plumbing team members.

Classroom Aids:

Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook

Tools, Equipment and Other Requirements

Nil

Module 18: Employability Skills (30 Hours)

Mapped to DGT/VSQ/N0101, v 1.0

Terminal Outcomes:

- Describe the importance and values of employability skills and apprenticeship opportunities to meet job demands.
- Explain basic communication skill, digital and financial literacy skills for customer-oriented outcome.

Duration: 20:00	Duration: 10:00
Theory – Key Learning Outcomes	Practical – Key Learning Outcomes
<ul style="list-style-type: none"> • Discuss the Employability Skills required for jobs in various industries • List different learning and employability related GOI and private portals and their usage • Explain the constitutional values, including civic rights and duties, citizenship, responsibility towards society and personal values and ethics such as honesty, integrity, caring and respecting others that are required to become a responsible citizen • Discuss importance of relevant 21st century skills. • Exhibit 21st century skills like Self-Awareness, Behavior Skills, time management, critical and adaptive thinking, problem-solving, creative thinking, social and cultural awareness, emotional awareness, learning to learn etc. in personal or professional life. • Describe the benefits of continuous learning. • Explain the importance of active listening for effective communication • Discuss the significance of working collaboratively with others in a team • Demonstrate how to behave, communicate, and conduct oneself appropriately with all genders and PwD • Discuss the significance of escalating sexual harassment issues as per POSH act. • Outline the importance of selecting the right financial institution, product, and service 	<ul style="list-style-type: none"> • Show how to practice different environmentally sustainable practices. • Show how to use basic English sentences for everyday conversation in different contexts, in person and over the telephone • Read and interpret text written in basic English • Write a short note/paragraph / letter/e - mail using basic English¹¹. Create a career development plan with well-defined short- and long-term goals • Demonstrate how to communicate effectively using verbal and nonverbal communication etiquette. • Create sample word documents, excel sheets and presentations using basic features • Create a professional Curriculum Vitae (CV)

- Demonstrate how to carry out offline and online financial transactions, safely and securely
- List the common components of salary and compute income, expenditure, taxes, investments etc.
- Discuss the legal rights, laws, and aids.
- Describe the role of digital technology in today's life.
- Demonstrate how to operate digital devices and use the associated applications and features, safely and securely
- Discuss the significance of displaying responsible online behavior while browsing, using various social media platforms, e-mails, etc., safely and securely
- Utilize virtual collaboration tools to work effectively
- Explain the types of entrepreneurship and enterprises
- Discuss how to identify opportunities for potential business, sources of funding and associated financial and legal risks with its mitigation plan
- Describe the 4Ps of Marketing-Product, Price, Place and Promotion and apply them as per requirement
- Create a sample business plan, for the selected business opportunity
- Describe the significance of analyzing different types and needs of customers
- Explain the significance of identifying customer needs and responding to them in a professional manner.
- Discuss the significance of maintaining hygiene and dressing appropriately
- Use various offline and online job search sources such as employment exchanges, recruitment agencies, and job portals respectively
- Discuss the significance of maintaining hygiene and confidence during an interview
- Perform a mock interview
- List the steps for searching and registering for apprenticeship opportunities

Classroom Aids:	
Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook	

Annexure

Trainer Requirements

Trainer Prerequisites						
Minimum Educational Qualification	Specialization	Relevant Industry Experience		Training Experience		Remarks
		Years	Specialization	Years	Specialization	
P.hd/M.Tech	Civil / Mechanical Engineering	1	Relevant	1	Relevant	
B.E/B.Tech	Civil / Mechanical Engineering	3	Relevant	1	Relevant	
Diploma	Civil / Mechanical Engineering	4	Relevant	1	Relevant	

Trainer Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Plumbing Site Engineer” mapped to QP: “PSC/Q0115, v2.0”. Minimum accepted score is 80%.	Recommended that the Trainer is certified for the Job Role: “Trainer”, mapped to the Qualification Pack: “MEP/Q2601”. Minimum accepted score as per MEPSC guidelines is 80%.

Assessor Requirements

Assessor Prerequisites						
Minimum Educational Qualification	Minimum Educational Qualification	Minimum Educational Qualification		Minimum Educational Qualification		Minimum Educational Qualification
		Years	Specialization	Years	Specialization	
P.hd/M.Tech	Civil / Mechanical Engineering	1	Relevant	1	Relevant	
B.E/B.Tech	Civil / Mechanical Engineering	3	Relevant	1	Relevant	
Diploma	Civil / Mechanical Engineering	4	Relevant	1	Relevant	

Assessor Certification	
Domain Certification	Platform Certification
Certified for Job Role: “Plumbing Site Engineer” mapped to QP: “PSC/Q0115, v2.0”. Minimum accepted score is 80%.	Recommended that the Assessor is certified for the Job Role: “Assessor”, mapped to the Qualification Pack: “MEP/Q2701”. Minimum accepted score as per MEPSC guidelines is 80%.

Assessment Strategy

Assessment is done through third parties who are affiliated to IPSC as Assessment Body. Assessors are trained & certified by IPSC through Training of Assessors program. The assessment involves two processes. The first process is gathering the evidence of the competency of individuals. The second part of the assessment process is the judgement, based on the evidence as to whether a person is competent as per the standard or not. The assessment plan contains the following information:

- What will be assessed, i.e., the competency based on each NOS
- How assessment will occur i.e., methods of assessment
- When the assessment will occur
- Where the assessment will take place i.e., context of the assessment (workplace/simulation)
- The criteria for decision making i.e., those aspects that will guide judgements and
- Where appropriate, any supplementary criteria used to make a judgement on the level of performance.

The assessment is conducted through theory, practical, project and viva voice.

References

Glossary

Term	Description
Declarative Knowledge	Declarative knowledge refers to facts, concepts and principles that need to be known and/or understood in order to accomplish a task or to solve a problem.
Key Learning Outcome	Key learning outcome is the statement of what a learner needs to know, understand and be able to do in order to achieve the terminal outcomes. A set of key learning outcomes will make up the training outcomes. Training outcome is specified in terms of knowledge, understanding (theory) and skills (practical application).
OJT (M)	On-the-job training (Mandatory); trainees are mandated to complete specified hours of training on site
OJT (R)	On-the-job training (Recommended); trainees are recommended the specified hours of training on site
Procedural Knowledge	Procedural knowledge addresses how to do something, or how to perform a task. It is the ability to work, or produce a tangible work output by applying cognitive, affective or psychomotor skills.
Training Outcome	Training outcome is a statement of what a learner will know, understand and be able to do upon the completion of the training .
Terminal Outcome	Terminal outcome is a statement of what a learner will know, understand and be able to do upon the completion of a module . A set of terminal outcomes help to achieve the training outcome.

Acronyms and Abbreviations

Term	Description
QP	Qualification Pack
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards