# Model Curriculum

**QP Name: Plumbing Supervisor**

**QP Code: PSC/Q0114**

**QP Version: 2.0**

**NSQF Level: 5**

**Model Curriculum Version: 1.0**

Indian Plumbing Skills Council || Unit- 606 & 609, Tower-C, DLF Prime Towers, Phase-1, Okhla, Delhi, 110020

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# Training Parameters

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|---|---|
| **Sector** | Plumbing |
| **Sub-Sector** | Industrial / Non-Industrial Plumbing |
| **Occupation** | Plumbing Systems Installation and Maintenance |
| **Country** | India |
| **NSQF Level** | 5 |
| **Aligned to NCO/ISCO/ISIC Code** | NCO-2015/3123.0302 |
| **Minimum Educational Qualification and Experience** | 10th Class + I.T.I (preferably in Plumbing) with 3 Years of experience as Plumber General<br>OR<br>8th Class with 6 Years of experience as Plumber General |
| **Pre-Requisite License or Training** | NA |
| **Minimum Job Entry Age** | 21 years |
| **Last Reviewed On** | 23/06/2021 |
| **Next Review Date** | 23/06/2026 |
| **NSQC Approval Date** | |
| **QP Version** | 2.0 |
| **Model Curriculum Creation Date** | 23/06/2021 |
| **Model Curriculum Valid Up to Date** | 23/06/2026 |
| **Model Curriculum Version** | 1.0 |
| **Minimum Duration of the Course** | 588 Hours |
| **Maximum Duration of the Course** | 588 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.

- Draft a plan for plumbing assignments
- Discuss the importance of organizing the resources for plumbing tasks
- Apply appropriate techniques to inspect the plumbing work to ensure compliances
- Demonstrate how to repair and maintain plumbing systems
- Apply appropriate health and safety practices at the workplace
- Discuss the importance of working effectively with others
- Demonstrate practices for optimizing resource utilization at the workplace

## 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 |
|---|---|---|---|---|---|
| **Bridge Module** | *04:00 Hours* | *00:00 Hours* | *00:00 Hours* | *00:00 Hours* | **04:00 Hours** |
| Module 1: Introduction to the sector and the job role | 04:00 Hours | 00:00 Hours | 00:00 Hours | 00:00 Hours | 04:00 Hours |
| **PSC/N0143: Prepare for a Plumbing Assignment NOS Version No.: 1.0 NSQF Level: 5** | **96:00 Hours** | **100:00 Hours** | **00:00 Hours** | **00:00 Hours** | **196:00 Hours** |
| Module 2: Basics of Plumbing | 12:00 Hours | 00:00 Hours | 00:00 Hours | 00:00 Hours | 12:00 Hours |
| Module 3: Plumbing Drawings and Documentation | 32:00 Hours | 16:00 Hours | 00:00 Hours | 00:00 Hours | 48:00 Hours |
| Module 4: Site Survey | 28:00 Hours | 44:00 Hours | 00:00 Hours | 00:00 Hours | 72:00 Hours |
| Module 5: Planning and Organising Resources | 24:00 Hours | 40:00 Hours | 00:00 Hours | 00:00 Hours | 64:00 Hours |
| **PSC/N0144: Inspect the Plumbing Work to Ensure Compliances NOS Version No.: 1.0 NSQF Level: 5** | **40:00 Hours** | **88:00 Hours** | **00:00 Hours** | **00:00 Hours** | **128:00 Hours** |
| Module 6: Monitoring and evaluating work | 20:00 Hours | 44:00 Hours | 00:00 Hours | 00:00 Hours | 64:00 Hours |
| Module 7: Ensuring adherence to timelines and quality standards | 20:00 Hours | 44:00 Hours | 00:00 Hours | 00:00 Hours | 64:00 Hours |

| | | | | | |
|---|---|---|---|---|---|
| **PSC/N0145: Ensure Effective Repair and Maintenance of Plumbing Systems** <br> **NOS Version No.: 1.0** <br> **NSQF Level: 5** | **40:00 Hours** | **92:00 Hours** | **00:00 Hours** | **00:00 Hours** | **132:00 Hours** |
| Module 8: Identifying repair and maintenance requirement | 20:00 Hours | 44:00 Hours | 00:00 Hours | 00:00 Hours | 64:00 Hours |
| Module 9: Organising resources for proper repair and maintenance of plumbing systems | 20:00 Hours | 48:00 Hours | 00:00 Hours | 00:00 Hours | 68:00 Hours |
| **PSC/N0136** <br> **Apply health and safety practices at the workplace** <br> **NOS Version No.: 1.0** <br> **NSQF Level: 4** | **16:00 Hours** | **32:00 Hours** | **00:00 Hours** | **00:00 Hours** | **48:00 Hours** |
| Module 10: Health and safety | 16:00 Hours | 32:00 Hours | 00:00 Hours | 00:00 Hours | 48:00 Hours |
| **PSC/N0138: Implement Measures to Work Effectively** <br> **NOS Version No.: 1.0** <br> **NSQF Level: 5** | **16:00 Hours** | **32:00 Hours** | **00:00 Hours** | **00:00 Hours** | **48:00 Hours** |
| Module 11: Team Effectiveness | 16:00 Hours | 32:00 Hours | 00:00 Hours | 00:00 Hours | 48:00 Hours |
| **SGJ/N1702** <br> **Optimize Resources Utilization at workplace** <br> **NOS Version No.: 1.0** <br> **NSQF Level: 3** | **08:00 Hours** | **24:00 Hours** | **00:00 Hours** | **00:00 Hours** | **32:00 Hours** |
| Module 12: Optimum utilization of resources | 08:00 Hours | 24:00 Hours | 00:00 Hours | 00:00 Hours | 32:00 Hours |
| **Total Duration** | **220:00 Hours** | **368:00 Hours** | **00:00 Hours** | **00:00 Hours** | **588:00 Hours** |

# Module Details

## Module 1: Introduction to the sector and the job role
*Bridge Module*

**Terminal Outcomes:**

- Explain the importance of plumbing industry.
- Discuss the various types of plumbing organisations.
- Explain the scope of employment and key responsibilities of a plumbing supervisor.

| Duration: *04:00* | Duration: *00:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>Outline the overview of the plumbing industry.</li><li>State the products and services offered by organisations involved in plumbing installation and maintenance.</li><li>Depict the departments and hierarchy within organisations involved in plumbing installation and maintenance.</li><li>Discuss the scope of employment in the contracting segment of the industry.</li><li>List the key responsibilities of a plumbing supervisor/foreman.</li><li>State the importance of following policies, and procedures related to employment and performance conditions followed by organisations that hire plumbing supervisors.</li></ul> | |
| **Classroom Aids:** ||
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook ||
| **Tools, Equipment and Other Requirements** ||
| Nil ||

# Module 2: Basics of plumbing
*Mapped to PSC/N0143, v 1.0*

**Terminal Outcomes:**

- Explain the processes and relevant standards for water supply, drainage and plumbing installation.
- Identify the various plumbing related systems, materials and tools.

| Duration: 12:00 | Duration: 00:00 |
| --- | --- |
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>Describe the process of main supply of water and drainage.</li><li>Explain the various processes involved in plumbing installations, mechanical and electrical activities.</li><li>List the types, grades, characteristics and application of different pipe fittings and supports used in plumbing systems.</li><li>Discuss the various fixtures and their materials, finishes along with their usages and limitations.</li><li>State the various fit off processes and jointing techniques adopted while installing plumbing pipes, fittings and fixtures.</li><li>Identify the piping and plumbing tools and equipment.</li><li>List the standards applicable to fixture and/or piping installation in plumbing.</li></ul> | |
| **Classroom Aids:** | |
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook | |
| **Tools, Equipment and Other Requirements** | |
| Pipes (such as PVC, cPVC, uPVC, mild steel, cast iron, galvanised iron), pipe fittings, plumbing fixtures of various types and finishes, plumbing accessories, tools, mechanical fasteners (such as nuts, bolts, screws). | |

## Module 3: Plumbing drawings and documentation
### Mapped to PSC/N0143, v 1.0

**Terminal Outcomes:**

- Understand plumbing drawings.
- Identify relevant information from plumbing project documents.

| Duration: 32:00 | Duration: 16:00 |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>Explain the types and purposes of various project/planning documents related to plumbing.</li><li>Explain the types and purposes of various plumbing drawings and the relevant information available in them.</li><li>Interpret common plumbing symbols from the plumbing drawings.</li><li>State the relevant elements of the International System of Units (SI) for measurement required to perform basic calculations and arithmetic operations based on plumbing drawings.</li></ul> | <ul><li>Read design drawings.</li><li>Demonstrate the plumbing workflow on site as per the plumbing drawing.</li><li>Demonstrate how to extract relevant information from project/planning documents.</li></ul> |
| **Classroom Aids:** ||
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook ||
| **Tools, Equipment and Other Requirements** ||
| Various types of plumbing drawings, plumbing project plans, work schedules, charts, work bulletins, memos ||

## Module 4: Site Survey
### Mapped to PSC/N0143, v 1.0

**Terminal Outcomes:**

- Perform the steps involved in carrying out a site survey to evaluate effectiveness of design and plan documents for plumbing installation.
- Identify modifications required in the design and plan based on site findings.

| Duration: _28:00_ | Duration: _44:00_ |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>State the parameters which form the basis of a site survey and the considerations to be kept in mind while conducting it.</li><li>Explain how to inspect the impact of local contextual factors on the maintenance and repair work plan and requirements, including time, costs and quality by applying various techniques.</li><li>Discuss workplace hazard reporting and handling procedures</li><li>Explain how to identify improvements required in plumbing plan/designs based on relevant contextual factors of a plumbing work site.</li><li>State the importance of providing necessary information to relevant authorities about modification required in plumbing plan/design.</li></ul> | <ul><li>Demonstrate how to perform a survey of a plumbing work site to verify plumbing design and project plan prepared for the site.</li><li>Show how to inspect the structures at the work site with respect to factors that could lead to weakening of pipe installations.</li><li>Apply appropriate techniques to evaluate site condition against workplace safety requirements</li></ul> |
| **Classroom Aids:** | |
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook | |
| **Tools, Equipment and Other Requirements** | |
| Work-site for plumbing installation, plumbing drawings, plumbing project plans, work schedules, measurement tools | |

# Module 5: Planning and Organising Resources
## *Mapped to PSC/N0143, v 1.0*

**Terminal Outcomes:**

- Demonstrate the activities involved in organising resources for plumbing tasks.

| Duration: *24:00* | Duration: *40:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>Explain the basic planning tools and processes.</li><li>State the formula and concepts used to calculate and perform arithmetic operations for estimating manpower and material requirements based on the project plan.</li><li>Discuss the type of manpower required at a plumbing site, their key responsibilities and inter-dependencies.</li><li>List the factors that influence sequencing and scheduling of plumbing tasks in an assignment.</li><li>State the importance of following the workflow with respect to the processes and the concerned personnel for requisitioning material and manpower resources.</li><li>Recall the relevant forms that a plumbing supervisor needs to fill for material requisitioning, reporting and employment of manpower.</li><li>State the importance of following basic material issuance and inventory management principles.</li><li>Explain the importance of ensuring that there is no material shortage once the plumbing work has started.</li><li>State the considerations to be kept in mind while assigning work to team members.</li></ul> | <ul><li>Demonstrate how to determine resource requirements such as manpower, type of materials for plumbing tasks and their quantity based on plumbing drawings and project plan.</li><li>Demonstrate the selection and ordering of materials required for the plumbing tasks.</li><li>Prepare a sample schedule for the plumbing activities and their supervision as per work specifications.</li><li>Prepare a sample work allocation plan for a team based on the schedule of activities. availability of manpower, equipment and weather conditions.</li></ul> |
| **Classroom Aids:** ||
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook ||
| **Tools, Equipment and Other Requirements** ||
| Components of drainage system (drainage pipes, ventilation/anti-siphonage pipes, pipe fittings, traps, cleanouts, catch basins, manholes, inspection chamber, soak pit, storm water drainage pipes), pipes used in drainage system (SW, PVC, CI, AC, RCC, HDP), water traps (as per shape: P-trap, S-trap, Q-trap, bottle trap; as per function: floor-trap, gully trap, intercepting trap), pumps such as submersible water pumps, dewatering pumps (for rainwater piping). ||

## Module 6: Monitoring and evaluating work
### Mapped to PSC/N0144, v 1.0

**Terminal Outcomes:**

- Demonstrate how to carry out an inspection of plumbing installation work-site.
- Perform a mock evaluation of the plumbing installation completed at the work site.

| Duration: *20:00* | Duration: *44:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>State the importance of regular inspection of work.</li><li>List the steps involved in the inspection at the work site for plumbing tasks.</li><li>State the correct installation procedure and industry standards for good plumbing practices that have to be checked during work evaluation.</li><li>List the key factors to be inspected to evaluate the installation in line with the plumbing design and documented implementation procedure.</li><li>Describe the procedure to test the installed plumbing systems and equipment.</li><li>Discuss the probable problematic situations in plumbing activities.</li><li>Explain the importance of cleaning plumbing fixtures and accessories prior to installation.</li><li>Explain the correct process of disposing unwanted waste/debris as per industry practices.</li><li>State the importance of following organisational procedures to share the reports and important documents with the team and designated personnel.</li><li>List common documentation practices with respect to monitoring and evaluation of plumbing work.</li></ul> | <ul><li>Demonstrate how to carry out an inspection of plumbing activities at a work site to check if they are as per plumbing design, work instructions, schedules, budgets and targets.</li><li>Evaluate a sample set of design, deliverables and schedules to identify problems, gaps and delays that could occur.</li><li>Demonstrate how to carry out an inspection to ensure suitability, correct specifications and standards of the plumbing materials and fixtures.</li><li>Perform the steps to check the fixtures and accessories to ensure the cleanliness as per work instructions prior to installations</li><li>Show how to check whether a plumbing installation has been done in accordance with industry defined techniques.</li><li>Demonstrate the tests to be carried out on installed plumbing systems to identify leakages and tight connections.</li><li>Demonstrate the preparation of a report to record the gaps in quality of work and work progress.</li></ul> |
| **Classroom Aids:** ||
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook ||
| **Tools, Equipment and Other Requirements** ||
| Types of fixtures (taps/faucets, valves, water closet, showers, sinks, bath-tubs, basin, wall hung urinals, pop-up drains, water heaters), dishwashing machines, clothes washing machine, types of fasteners and supports (anchors, screws, nuts, bolts, circlips, clamps, wall hangers, carriers, etc.). ||

## Module 7: Ensuring adherence to timelines and standards
### Mapped to PSC/N0144, v 1.0

**Terminal Outcomes:**

- Apply appropriate practices to ensure adherence to timelines while conducting plumbing related activities at site.

| Duration: *20:00* | Duration: *44:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>State the importance of providing suggestions for revising plan in order to adhere to timelines and standards.</li><li>Explain how to inspect the impact of local contextual factors on the maintenance and repair work plan and requirements, including time, costs and quality by applying various techniques.</li><li>Discuss the importance of sharing the modifications/changes in the action plan or schedule with all personnel impacted by the same.</li><li>State the importance of ensuring that the installed materials and fixtures are of correct specifications and standards.</li><li>Discuss best practices for solving problems with respect to adherence to timelines and standards in plumbing installation work.</li></ul> | <ul><li>Extract information regarding revision of requirements by comparing a sample of a revised plan and original plan.</li><li>Demonstrate how to calculate the additional requirement of resources, materials and supplies at the work site based on a sample revised plan.</li></ul> |
| **Classroom Aids:** ||
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook ||
| **Tools, Equipment and Other Requirements** ||
| Plunger, pressure gauges, aerators septic systems, roof drain's strainer basket, Allen wrench, shower drain, pipes tube clamp, saws, pipe cutters, sealing compound, dripping faucets, tongue-and-groove plier, water heaters, washing machines, dishwashers, waste containers and logbook. ||

## Module 8: Identifying repair and maintenance requirement
### Mapped to PSC/N0145, v 1.0

**Terminal Outcomes:**

- Perform the steps involved in visual checking and inspection of existing plumbing systems that require repair or maintenance.

| Duration: 20:00 | Duration: 44:00 |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>State common elements of policies on repair and maintenance of plumbing systems in residential and commercial establishments.</li><li>Discuss the role of plumbing supervisor/foreman in plumbing related repair and maintenance work.</li><li>Explain the inspection procedure for installed plumbing systems.</li><li>List the important considerations to be kept in mind while carrying out MEP activities during the visual checking of plumbing systems for the identification of repair and maintenance requirement.</li><li>Explain how to identify repair and maintenance requirements by referring to product manuals/catalogues.</li><li>List the basic measurements that are performed for various plumbing systems that can help identify faults, if any.</li><li>Explain the process of checking for any active leaks in the piping and plumbing fixtures</li><li>Recall the tests to be conducted for maintaining adequate flow of water.</li><li>Describe the procedure to check for airtight connections of plumbing fittings and accessories.</li><li>Elucidate the harm (corrosion, rusting, wear and tear) caused to pipes by factors such as temperature, pH (acidity levels) and chemical composition, oxidation, ageing and other hazards.</li><li>Identify the signs of corrosion and rusting in plumbing systems.</li><li>Identify the signs of lime scale around fixtures such as shower heads and water faucets.</li></ul> | <ul><li>PC1. Perform the steps to conduct a visual check of a faulty plumbing part/ fixture/ piping check to identify the type of problem.</li><li>PC2. Demonstrate how to conduct relevant checks on a faulty plumbing system to decide the type of repair or preventive maintenance to be performed on it.</li><li>PC4. Apply appropriate techniques to carry out routine measurements to estimate the required resources and accessories.</li><li>PC5. Demonstrate the inspection process for planning space allocation for plumbing installations at a work site.</li><li>PC13. Demonstrate how to conduct tests to check the pressure within the fittings, accessories, piping and pump systems.</li><li>PC14. Perform the steps involved in checking for active leaks such as water spots, moisture or puddles in plumbing systems.</li></ul> |

| | |
|---|---|
| • Summarise the records to be maintained with respect to repair and maintenance of plumbing systems. | |

**Classroom Aids:**

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

**Tools, Equipment and Other Requirements**

Plumbing systems with various types of faults. Measurement tools and tools for testing water pressure and water leaks.

## Module 9: Organising resources for proper repair and maintenance of plumbing systems
### *Mapped to PSC/N0145, v 1.0*

**Terminal Outcomes:**

- Demonstrate the tasks involved in organising resources for proper repair and maintenance of plumbing systems.

| Duration: *20:00* | Duration: *48:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>Explain the importance of repairing, replacing and discarding worn out or damaged parts and accessories.</li><li>List common industry approved techniques for repair and maintenance of plumbing systems.</li><li>Explain how to inspect the impact of local contextual factors on the maintenance and repair work plan and requirements, including time, costs and quality by applying various techniques.</li><li>Explain the importance of briefing the plumbers and clients about the repair and maintenance work to be done.</li><li>State what could be done in situations or problems that do not have a standard solution.</li><li>Discuss the techniques to maintain the required pressure in the plumbing systems</li><li>Recall the treatment techniques for preventing rusting and corrosion of plumbing materials.</li><li>Explain the importance of making the required tools and materials available to the team.</li><li>Discuss the importance of checking the repaired systems for proper functioning before handing it over.</li><li>List the steps involved in the process of handing over the repaired system to client.</li></ul> | <ul><li>Calculate the total cost of the repair and maintenance for a project based on requirements.</li><li>Demonstrate the process of manpower allocation for the plumbing repair and maintenance activity.</li><li>Role-play a situation on how to brief the concerned authority/designated personnel about the type of work to be carried out.</li><li>Role play on how to brief the customers about proper use and upkeep of plumbing equipment after task completion and handover of the maintenance manuals.</li></ul> |
| **Classroom Aids:** ||
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook ||
| **Tools, Equipment and Other Requirements** ||
| Plumbing systems with various types of faults. Measurement tools and tools for testing water pressure and water leaks. Tools for repairing plumbing faults and performing preventive maintenance. ||

## Module 10: 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: *16:00* | Duration: *32:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| • Differentiate between risks and hazards.<br>• Discuss the specific safety and health related problems faced in domestic, commercial and institutional setups.<br>• List the various types of hazards (such as physical, fire, chemical compounds and electrical) that could affect the work process.<br>• List the various hazardous environments and common hazards that can occur during plumbing installation and maintenance along with their precautions and remedial measures.<br>• Discuss the importance of various types of personal protective equipment (PPE).<br>• Discuss where the general health and safety equipment commonly is kept at the workplace.<br>• Explain the various types of safety signs and their significance in the work process.<br>• Discuss various causes of fire and precautionary activities to prevent the fire accident.<br>• 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, $CO_2$, fire extinguishing chemical, sand, blanket, etc. used for extinguishing fire as per the type (as per class A, B, C and D).<br>• Describe rescue techniques applied during a fire hazard or electrocution.<br>• Discuss appropriate basic first aid treatment relevant to the condition e.g. shock, electrical shock, bleeding, minor burns, poisoning, eye injuries etc. | • Perform inspection of a work area in order to identify risks and hazards.<br>• Apply various health and safety precautions to be taken during plumbing work.<br>• Apply personal and workspace hygiene and sanitation practices.<br>• Dramatize workplace emergency and evacuation procedures using role plays.<br>• Demonstrate the correct use of fire extinguishers.<br>• Dramatize, using role play, safe methods of freeing a person from electrocution.<br>• Perform appropriate first aid treatment for various conditions such as bleeding, burns, choking, electric shock and poisoning and injury.<br>• Demonstrate the process of providing cardiopulmonary resuscitation (CPR). |

| | |
|---|---|
| • Discuss potential injuries and health problems associated with incorrect handing 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 11: 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**: *16:00* | **Duration**: *32:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>State the importance of effective communication in the workplace and the impact of poor communication on any employee, employer and customer.</li><li>List various components of effective communication.</li><li>State the advantages and disadvantages of various modes of communication.</li><li>State the importance of teamwork in organizational and individual success.</li><li>Describe the group dynamics and processes</li><li>List the common reasons for interpersonal conflict and ways of managing it effectively.</li><li>Discuss the possible ways to deal with grievances and problems appropriately and effectively</li><li>Explain the concept of goal setting and its importance for self and team.</li><li>State common measures that can be implemented at a plumbing work site to improve workplace productivity and team effectiveness.</li><li>Discuss the importance of adhering to legislation, standards, policies, and procedures relevant to own employment and performance conditions.</li><li>Discuss types of unacceptable behaviour</li><li>Explain the importance of ethics and discipline for professional success</li><li>Explain the impact of gender, disability, cultural and age-related biases, stereotyping at the workplace and in society.</li><li>State the laws, acts, provisions and schemes defined for PwD and against sexual</li></ul> | <ul><li>Dramatize situations showing good practices for handling worker complaints and concerns.</li><li>Dramatize the process of dealing with conflicts among team members.</li><li>Demonstrate the various administrative duties and personnel duties.</li><li>Demonstrate the use of inclusive language (verbal, non-verbal and written) that is gender, disability and culturally sensitive.</li><li>Dramatize the use of appropriate tone, pitch and language to convey politeness, assertiveness, care, professionalism and a non-biased attitude.</li><li>Demonstrate practices to eliminate personal bias based on gender, disability, caste, religion, colour, sexual orientation and culture from routine transactions.</li><li>Demonstrate how to give feedback on individual work performance to each team member for improvement in work quality.</li><li>Demonstrate the best practices for training of workers on performing various plumbing tasks correctly.</li></ul> |

- 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 types and 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 activities at site.

**Classroom Aids:**

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

**Tools, Equipment and Other Requirements**

Nil

## Module 12: Optimum utilisation of resources
### Mapped to SGJ/N1702, v 1.0

**Terminal Outcomes:**

- Use the material in an optimum way at work.
- Use energy/electricity optimally at work.
- Employ practices for minimization of waste generation.
- Demonstrate the process of waste disposal as per industry approved standards.

| Duration: *08:00* | Duration: *24:00* |
|---|---|
| **Theory – Key Learning Outcomes** | **Practical – Key Learning Outcomes** |
| <ul><li>Discuss the practices and impact of inefficient utilization of material and water.</li><li>Describe ways of efficiently managing material and water in the process.</li><li>Explain the basics of electricity.</li><li>List common electrical and thermal equipment used in a plumbing workplace.</li><li>Describe the use of prevalent energy efficient devices.</li><li>List indicators of common electrical problems.</li><li>Discuss common practices of conserving electricity.</li><li>Explain the importance of checking if the equipment/machine is functioning normally before commencing work and ensuring it is rectified.</li><li>Explain the usage of different colours of dustbins.</li><li>Differentiate between recyclable and non-recyclable, and hazardous waste generated.</li><li>Discuss efficient waste management practices.</li><li>Discuss the common ways employed by organizations, to minimize waste generated from plumbing activities.</li><li>Discuss common sources of pollution and ways to minimize it</li><li>Explain the importance of reporting malfunctioning (fumes /sparks /emission /vibration /noise) and lapse in the maintenance of equipment on time.</li></ul> | <ul><li>Identify ways to optimize usage of water and other materials in various tasks/activities/processes.</li><li>Perform inspection to check for spills/leakages at a workplace.</li><li>Apply various material conservation practices with respect to plumbing work.</li><li>Perform inspection of the work area for improperly connected electrical equipment.</li><li>Apply appropriate techniques to use energy/electricity in an optimum way.</li><li>Categorize waste into dry, wet, recyclable, non-recyclable and items of single-use plastics.</li><li>Employ effective waste management / recycling practices.</li></ul> |
| **Classroom Aids:** | |
| Computer, Projection Equipment, PowerPoint Presentation and software, Facilitator's Guide, Participant's Handbook | |
| **Tools, Equipment and Other Requirements** | |
| Energy-saving devices, non-recyclable, recyclable and reusable waste | |

# Annexure

## Trainer Requirements

<table>
<tr>
<td colspan="6" align="center"><b>Trainer Prerequisites</b></td>
</tr>
<tr>
<td rowspan="2"><b>Minimum Educational Qualification</b></td>
<td rowspan="2"><b>Specialization</b></td>
<td colspan="2"><b>Relevant Industry Experience</b></td>
<td colspan="2"><b>Training Experience</b></td>
<td rowspan="2"><b>Remarks</b></td>
</tr>
<tr>
<td><i>Years</i></td>
<td><i>Specialization</i></td>
<td><i>Years</i></td>
<td><i>Specialization</i></td>
</tr>
<tr>
<td>B. Tech/ B.E.</td>
<td>Civil or Mechanical Engineering</td>
<td>5</td>
<td>Plumbing</td>
<td>2</td>
<td>Plumbing</td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>Civil or Mechanical Engineering</td>
<td>7</td>
<td>Plumbing</td>
<td>2</td>
<td>Plumbing</td>
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</tr>
</table>

<table>
<tr>
<td colspan="2" align="center"><b>Trainer Certification</b></td>
</tr>
<tr>
<td align="center"><b>Domain Certification</b></td>
<td align="center"><b>Platform Certification</b></td>
</tr>
<tr>
<td>Certified for Job Role: "Plumbing Supervisor" mapped to QP: "PSC/Q0114, v2.0". Minimum accepted score is 80%.</td>
<td>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%.</td>
</tr>
</table>

## Assessor Requirements

| Assessor Prerequisites | | | | | | |
|---|---|---|---|---|---|---|
| **Minimum Educational Qualification** | **Specialization** | **Relevant Industry Experience** | | **Training/Assessment Experience** | | **Remarks** |
| | | *Years* | *Specialization* | *Years* | *Specialization* | |
| B. Tech/ B.E. | Civil or Mechanical Engineering | 7 | Plumbing | 2 | Plumbing | |
| Diploma | Civil or Mechanical Engineering | 8 | Plumbing | 2 | Plumbing | |

| Assessor Certification | |
|---|---|
| **Domain Certification** | **Platform Certification** |
| Certified for Job Role: "Plumbing Supervisor" mapped to QP: "PSC/Q0114, 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, viva voce and practical.

# 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 |