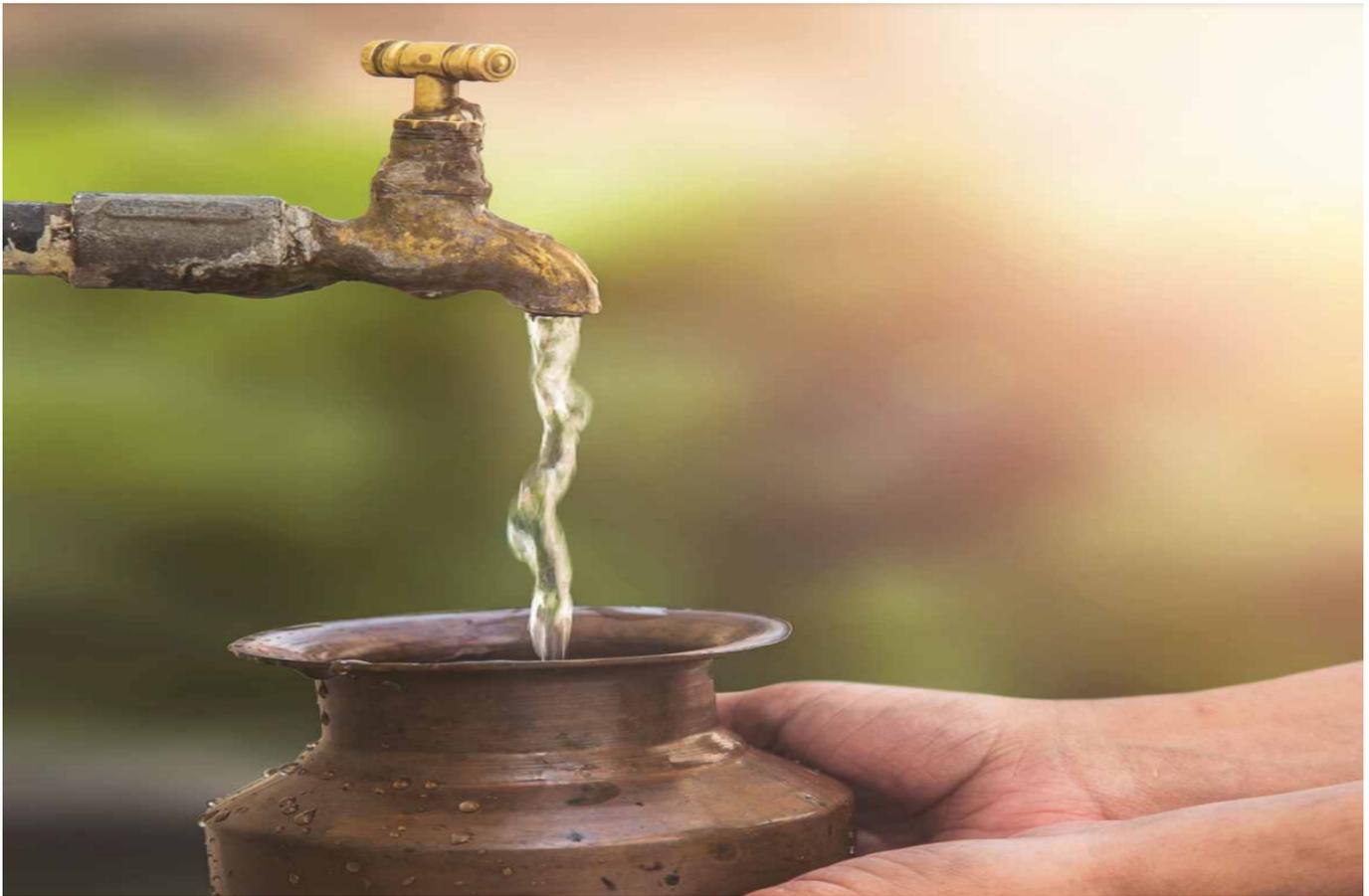


Qualification Pack



Jal Vitaran Sanchaalak (Water Distribution Operator) (Multi - Skill)

QP Code: PSC/Q0122

Version: 1.0

NSQF Level: 4

Water Management and Plumbing Skill Council || Unit No-606, DLF Prime Tower
Okhla Phase-1 New Delhi-110020 || email:standards@wmpsc.in



Qualification Pack

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Qualification Pack

PSC/Q0122: Jal Vitaran Sanchaalak (Water Distribution Operator) (Multi - Skill)

Brief Job Description

Jal Vitaran Sanchaalak (Water Distribution Operator) would act as a one stop solution provider who gives various services to communities under the Jal Jeevan Mission scheme such as plumbing installation, maintenance, repair and operations of various plumbing related structures and systems. The person will also mobilize community members and organize for required resources across a specified geographic area with support from Village Water & Sanitation Committee , Gram Panchayat and government bodies. The person carries operations on basic masonry work along with basic electrical installation.

Personal Attributes

The individual must be able to do laborious work, be a good listener and a team player. The person must be willing to take ownership, be result oriented and have a positive attitude.

Applicable National Occupational Standards (NOS)

Compulsory NOS:

1. [PSC/N0163: Installation and Operations of Plumbing and Water Management Systems](#)
2. [PSC/N0174: Carry out associated Basic Masonry and Manhole Construction Work](#)
3. [PSC/N0166: Perform Installation, Operation and Maintenance of Pumps and Related Machinery at Water Supply Stations and Water Treatment Units](#)
4. [PSC/N0175: Perform basic installation of electrical fixtures and temporary LV connections](#)
5. [PSC/N0136: Apply Health and Safety Practices at the Workplace](#)
6. [PSC/N0149: Assist Village Water Sanitation Committees \(VWSCs\) to Conduct Water Quality Survey](#)
7. [DGT/VSQ/N0101: Employability Skills \(30 Hours\)](#)

Qualification Pack (QP) Parameters

Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing

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Occupation	Plumbing Systems Installation and Maintenance, Material Handling
Country	India
NSQF Level	4
Credits	17
Aligned to NCO/ISCO/ISIC Code	NCO-2015/7126.0101, NCO-2015/3132.0600, NCO-2015/8212.0402, NCO-2015/7112.0201
Minimum Educational Qualification & Experience	12th grade Pass OR Completed 2nd year of the 3-year diploma after 10 (Civil Engineering) OR 10th Class/I.T.I with 2 Years of experience Relevant OR 8th grade pass with 2 years of NTC with 2 Years of experience Relevant OR Previous relevant Qualification of NSQF Level (3 as Assistant Plumber - General with minimum 8th Grade Pass) with 3 Years of experience Relevant OR Previous relevant Qualification of NSQF Level (3.5 with minimum 8th Grade Pass) with 2 Years of experience Relevant
Minimum Level of Education for Training in School	10th Class
Pre-Requisite License or Training	NA
Minimum Job Entry Age	20 Years
Last Reviewed On	NA
Next Review Date	13/06/2026
NSQC Approval Date	13/06/2023
Version	1.0
Reference code on NQR	QM-4PL-00358-2023-V1-WMPS
NQR Version	1.0

Qualification Pack

PSC/N0163: Installation and Operations of Plumbing and Water Management Systems

Description

This unit is about the identification of sites, proper usages of tools and equipment for the installation and operations of plumbing and water management system.

Scope

The scope covers the following :

- prepare for installation of plumbing system
- install plumbing pipes, fittings, sanitary fixtures and CP fittings
- post installation operations and checks

Elements and Performance Criteria

preparation for installation

To be competent, the user/individual on the job must be able to:

- PC1.** collect plumbing material as per type, size and requirement based on specifications from drawings and plans
- PC2.** correct measurement and marking the dimensions for fabrication on the pipes and fittings making allowances for spring-back, distortion and assembly carefully.

install plumbing pipes, fittings, sanitary fixtures and CP fittings

To be competent, the user/individual on the job must be able to:

- PC3.** cut various types of pipes to appropriate length
- PC4.** bend and form the pipes to specified angle and offsets
- PC5.** prepare pipe ends using techniques such as reaming, leveling, filing, grinding, etc.
- PC6.** joining of different type of pipes using fittings and relevant techniques
- PC7.** construct chambers to accommodate drainage systems as per drawings/specifications
- PC8.** locate various drainage components and its route as per plumbing project plans.
- PC9.** carry out installation of the various components of drainage system such as pipes and their fittings, manholes, traps, cleanouts, catch basins, inspection chamber, soak pit etc.
- PC10.** selection of type, size and quantity of fixture according to given specifications
- PC11.** cutting of physical structures such as walls, concrete in line with correct markings and specifications to perform internal pipe installations
- PC12.** install valves and traps as per plumbing project plan
- PC13.** install fixtures as per specifications without damaging fixtures, pipework and the surrounding conditions etc.
- PC14.** install and secure the sensors for touchless fittings and fixtures in the provided slot and insert batteries for sensor-based fittings and fixtures safely

post installation operations and checks

To be competent, the user/individual on the job must be able to:



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- PC15.** clear the area from hazardous substances, debris and waste as per organizational norms and plan tasks in agreement with others while adhering to time commitments
- PC16.** make sure that all inspection openings and covers are being fitted according to relevant standards and job specifications
- PC17.** test the installations for proper functioning
- PC18.** check and rectify faults that are within limits of expertise and escalate higher authorities to rectify it
- PC19.** backfill excavated areas to secure the installation
- PC20.** clear the work area and dispose, reuse or recycle left over materials according to legislation, regulations, codes of practice and job specification
- PC21.** clean and store tools and equipment according to manufacturer's recommendations and workplace procedures

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** organization's policies on quality and delivery standards, safety and hazards, integrity, dress code, etc.
- KU2.** individual's role in the workflow
- KU3.** risk and impact of not following defined procedures/work instructions
- KU4.** standards, regulations and codes of practice relevant to the plumbing industry
- KU5.** alignment and elevation techniques used in plumbing systems
- KU6.** types of various plumbing fixtures, pipes and fittings
- KU7.** layout of piping systems and types and grades of pipes and fittings
- KU8.** identification of standard plumbing symbols used in sketches and blueprints
- KU9.** techniques of installing the water piping system in a building such as over ground piping, underground piping, piping embedded in concrete, concealed piping, wall mounted piping
- KU10.** standards applicable to the piping installation in plumbing
- KU11.** principles of siphon ball valves in a flushing system
- KU12.** types of plumbing fixtures and fittings that comes with sensor
- KU13.** basic working principal of sensor faucet
- KU14.** principles of valves and sensors in touchless system
- KU15.** description and sizes of pantry and laundry sinks, their waste outlets, bathtubs and its accessories
- KU16.** importance of introducing the traps of the sanitary fittings, both deep seal traps and low seal traps
- KU17.** properties of water, including pressure and flow rates
- KU18.** characteristics and the application of different pipe fittings and fixture supports, including fixing and jointing techniques
- KU19.** process of main supply of water and drainage
- KU20.** description of soil waste pipe, siphon pipe and vent pipe and their importance



Qualification Pack

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** perform arithmetic calculations of addition, subtraction, multiplication, division and conversion processes
- GS2.** read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi
- GS3.** prepare checklists, reports and fill out forms in local language or Hindi/English
- GS4.** measure all dimensions used in plumbing in metric scale
- GS5.** state information, doubts and concerns about work related matters in local language or Hindi/English
- GS6.** plan one's daily tasks to achieve maximum productivity
- GS7.** be punctual and work as per agreed priorities
- GS8.** listen to customer's concerns and doubts carefully and address them
- GS9.** be courteous and polite with customers and team members
- GS10.** establish workable solutions for problems in hand in consultation with others and record them
- GS11.** breakdown relevant work process into its constituent activities for ease of analysis
- GS12.** identify ways to increase productivity and reduce errors

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>preparation for installation</i>	2	6	-	2
PC1. collect plumbing material as per type, size and requirement based on specifications from drawings and plans	1	3	-	1
PC2. correct measurement and marking the dimensions for fabrication on the pipes and fittings making allowances for spring-back, distortion and assembly carefully.	1	3	-	1
<i>install plumbing pipes, fittings, sanitary fixtures and CP fittings</i>	21	29	-	9
PC3. cut various types of pipes to appropriate length	2	3	-	1
PC4. bend and form the pipes to specified angle and offsets	2	3	-	1
PC5. prepare pipe ends using techniques such as reaming, leveling, filing, grinding, etc.	1	3	-	1
PC6. joining of different type of pipes using fittings and relevant techniques	2	3	-	1
PC7. construct chambers to accommodate drainage systems as per drawings/specifications	1	3	-	1
PC8. locate various drainage components and its route as per plumbing project plans.	1	2	-	1
PC9. carry out installation of the various components of drainage system such as pipes and their fittings, manholes, traps, cleanouts, catch basins, inspection chamber, soak pit etc.	2	2	-	0.5
PC10. selection of type, size and quantity of fixture according to given specifications	2	2	-	0.5
PC11. cutting of physical structures such as walls, concrete in line with correct markings and specifications to perform internal pipe installations	2	2	-	0.5
PC12. install valves and traps as per plumbing project plan	2	2	-	0.5

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. install fixtures as per specifications without damaging fixtures, pipework and the surrounding conditions etc.	2	2	-	0.5
PC14. install and secure the sensors for touchless fittings and fixtures in the provided slot and insert batteries for sensor-based fittings and fixtures safely	2	2	-	0.5
<i>post installation operations and checks</i>	7	20	-	4
PC15. clear the area from hazardous substances, debris and waste as per organizational norms and plan tasks in agreement with others while adhering to time commitments	1	3	-	0.5
PC16. make sure that all inspection openings and covers are being fitted according to relevant standards and job specifications	1	3	-	0.5
PC17. test the installations for proper functioning	1	2	-	1
PC18. check and rectify faults that are within limits of expertise and escalate higher authorities to rectify it	1	3	-	0.5
PC19. backfill excavated areas to secure the installation	1	3	-	0.5
PC20. clear the work area and dispose, reuse or recycle left over materials according to legislation, regulations, codes of practice and job specification	1	3	-	0.5
PC21. clean and store tools and equipment according to manufacturer's recommendations and workplace procedures	1	3	-	0.5
NOS Total	30	55	-	15



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0163
NOS Name	Installation and Operations of Plumbing and Water Management Systems
Sector	Plumbing
Sub-Sector	Water Supply & Water Treatment & Quality Control
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	4
Version	1.0
Last Reviewed Date	NA
Next Review Date	13/06/2026
NSQC Clearance Date	13/06/2023



Qualification Pack

PSC/N0174: Carry out associated Basic Masonry and Manhole Construction Work

Description

This unit is about carrying out associated basic masonry and manhole construction work which involves various tasks related to the construction and maintenance of masonry structures and manholes

Scope

The scope covers the following :

- Carry out casting of pole stand
- Carry out operations on scaffold and shuttering
- Identify the materials and bonds for brickwork and masonry and their repair
- Plaster masonry on internal & external surface
- Perform construction of manholes

Elements and Performance Criteria

Carry out casting of pole stand

To be competent, the user/individual on the job must be able to:

- PC1.** create a solid base for the structure to ensure its stability
- PC2.** obtain the necessary materials, including cement, sand, aggregates, and steel bars
- PC3.** mix the concrete ingredients, including cement, sand, and aggregates in the correct proportions
- PC4.** pour the concrete into the formwork in layers
- PC5.** compact the concrete and remove any air pockets
- PC6.** smoothen the surface of the concrete

Carry out operations on scaffold and shuttering

To be competent, the user/individual on the job must be able to:

- PC7.** identify the types of scaffolds and shuttering
- PC8.** consider the safety regulations while setting up scaffold
- PC9.** ensure the components of scaffolds are connected properly
- PC10.** identify the type and size of shuttering as required
- PC11.** ensure that the shuttering is assembled properly
- PC12.** carry out the pouring of framework with concrete

Identify the materials and bonds for brickwork and masonry

To be competent, the user/individual on the job must be able to:

- PC13.** ensure the tools used in brickwork are in good condition.
- PC14.** carry out testing of bricks on field
- PC15.** ensure bricks are soaked in water properly prior to the use
- PC16.** lay and fix bricks as per the applicable bond using mortar

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- PC17.** identify the defects in brickwork that can possibly exist
- PC18.** carry out construction of brick masonry as per the standards
- PC19.** carry out removal of damaged element in brick masonry using different tools
- PC20.** replace the same with new bricks and ensure the proper bonding of old and new surface

Plaster masonry on internal & external surface

To be competent, the user/individual on the job must be able to:

- PC21.** identify materials and tools for plastering
- PC22.** carry out the sieving of aggregates as per the requirement
- PC23.** identify the type of plastering required
- PC24.** moisten out the dry surface of masonry before plastering
- PC25.** perform plastering operations on the wall
- PC26.** check for horizontal and vertical alignment using appropriate tools

Perform construction of manholes

To be competent, the user/individual on the job must be able to:

- PC27.** identify the interval on which manhole is to be constructed as per the drawing
- PC28.** determine the size of manhole and prepare the appropriate mix of mortar for the foundation as per specification
- PC29.** carry out laying of rcc foundation and finishing of the foundation using appropriate tools
- PC30.** plaster the manhole from inside as per specifications

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** different types of ingredients and equipment for casting pole stand
- KU2.** types of formworks
- KU3.** familiar with single scaffolds, double scaffolds, cantilever scaffolds, suspended scaffolds, steel scaffolds, timber scaffolds, aluminium scaffolds, plywood shuttering, steel shuttering
- KU4.** assembling of the shuttering using nails, screws, or bolts
- KU5.** standard practices for good masonry work
- KU6.** rules and regulations for handling tools, equipment, material and storing them safely
- KU7.** types of sketches for building brick structures
- KU8.** basic principle of measurement
- KU9.** types of grades in concrete
- KU10.** types of brick
- KU11.** different types of bonds used in brick masonry
- KU12.** using basic tools like plumb bob, spirit level, line thread etc.
- KU13.** equipment such as measuring tape, plumb bob, spirit level, bevel square, mason square, shovel, concrete mixer etc.
- KU14.** cement mix proportion, water-cement ratio
- KU15.** different methods of curing of masonry structure



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- KU16.** repairing and finishing of masonry work
- KU17.** different tools used in pointing such as stiff brush, soft brush pointing trowel, pointing bar, hose/buckets/plastic drums, mortar board, wire brush, etc.
- KU18.** types of mortar mix used in pointing
- KU19.** types of pointing such as struck pointing, flush pointing, grooved pointing, recessed pointing, etc.
- KU20.** standard practices for plastering work
- KU21.** equipment used in plastering
- KU22.** gradation of sand for internal and external plaster
- KU23.** different methods and techniques used for plastering internal and external, masonry work
- KU24.** types of plasters like sand faced, rough cast, pebble cast plaster etc.
- KU25.** grading and types of reinforcement
- KU26.** calculation intervals along the sewer or drainage as per drawing
- KU27.** metal steps for manholes
- KU28.** appropriate concrete cover

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** prepare checklists, reports and fill out forms in local language or Hindi/English
- GS2.** perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS3.** establish priorities and deadlines in consultation with others and record them
- GS4.** plan one's daily tasks to achieve maximum productivity
- GS5.** be punctual and work as per agreed priorities
- GS6.** manage distractions and maintain workplace discipline
- GS7.** listen to customer's concerns and doubts carefully and address them
- GS8.** read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or English
- GS9.** state information, doubts and concerns about work related matters in local language or Hindi/English
- GS10.** be courteous and identify ways to increase productivity and reduce errors
- GS11.** breakdown relevant work process into its constituent activities for ease of analysis and identify ways to increase productivity and reduce error
- GS12.** establish workable solutions for problems in hand in consultation with others and record them

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Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Carry out casting of pole stand</i>	6	12	-	5
PC1. create a solid base for the structure to ensure its stability	1	2	-	1
PC2. obtain the necessary materials, including cement, sand, aggregates, and steel bars	1	2	-	1
PC3. mix the concrete ingredients, including cement, sand, and aggregates in the correct proportions	1	2	-	1
PC4. pour the concrete into the formwork in layers	1	2	-	1
PC5. compact the concrete and remove any air pockets	1	2	-	0.5
PC6. smoothen the surface of the concrete	1	2	-	0.5
<i>Carry out operations on scaffold and shuttering</i>	6	9	-	5
PC7. identify the types of scaffolds and shuttering	1	1	-	0.5
PC8. consider the safety regulations while setting up scaffold	1	1	-	0.5
PC9. ensure the components of scaffolds are connected properly	1	2	-	1
PC10. identify the type and size of shuttering as required	1	2	-	1
PC11. ensure that the shuttering is assembled properly	1	2	-	1
PC12. carry out the pouring of framework with concrete	1	1	-	1
<i>Identify the materials and bonds for brickwork and masonry</i>	8	13	-	4
PC13. ensure the tools used in brickwork are in good condition.	1	1	-	0.5

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC14. carry out testing of bricks on field	1	1	-	0.5
PC15. ensure bricks are soaked in water properly prior to the use	1	1	-	0.5
PC16. lay and fix bricks as per the applicable bond using mortar	1	2	-	0.5
PC17. identify the defects in brickwork that can possibly exist	1	2	-	0.5
PC18. carry out construction of brick masonry as per the standards	1	2	-	0.5
PC19. carry out removal of damaged element in brick masonry using different tools	1	2	-	0.5
PC20. replace the same with new bricks and ensure the proper bonding of old and new surface	1	2	-	0.5
<i>Plaster masonry on internal & external surface</i>	6	10	-	3
PC21. identify materials and tools for plastering	1	1	-	0.5
PC22. carry out the sieving of aggregates as per the requirement	1	1	-	0.5
PC23. identify the type of plastering required	1	2	-	0.5
PC24. moisten out the dry surface of masonry before plastering	1	2	-	0.5
PC25. perform plastering operations on the wall	1	2	-	0.5
PC26. check for horizontal and vertical alignment using appropriate tools	1	2	-	0.5
<i>Perform construction of manholes</i>	4	6	-	3
PC27. identify the interval on which manhole is to be constructed as per the drawing	1	1	-	0.5
PC28. determine the size of manhole and prepare the appropriate mix of mortar for the foundation as per specification	1	1	-	1



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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC29. carry out laying of rcc foundation and finishing of the foundation using appropriate tools	1	2	-	1
PC30. plaster the manhole from inside as per specifications	1	2	-	0.5
NOS Total	30	50	-	20



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National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0174
NOS Name	Carry out associated Basic Masonry and Manhole Construction Work
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	4
Version	1.0
Last Reviewed Date	NA
Next Review Date	13/06/2026
NSQF Clearance Date	13/06/2023

Qualification Pack

PSC/N0166: Perform Installation, Operation and Maintenance of Pumps and Related Machinery at Water Supply Stations and Water Treatment Units

Description

This unit is about installing pumps systems, efficient pump operation, preventive maintenance of the pump and related machinery such as motor, valves and electrical components at water distribution and storage systems at water supply stations and water treatment units.

Scope

The scope covers the following :

- install pump and related equipment
- operate the pump
- maintain the pump and related machinery
- maintain sump and storage tanks
- Maintain water meters and flow meters
- Operate, maintain and repair pipelines and water treatment units

Elements and Performance Criteria

Install pump and related equipment

To be competent, the user/individual on the job must be able to:

- PC1.** understand water supply and drainage systems in rural India
- PC2.** assemble pump components, equipment and prepare the tools, area and materials for the task as per Manufacturer's policy
- PC3.** locate and mark position for inlet and outlet supply connections of pump
- PC4.** fix the pump at the designated location as per instruction and connect the hoses of inlet and outlet supply to the pump
- PC5.** make provisions for electrical and other required connections
- PC6.** install and connect pump components without any damage to pump, fixture, pipe work and the surrounding environment followed by adjusting the pressure/flow as per required supply and demand
- PC7.** check for cracks, defects and anomalies in the pumping apparatus, condition of couplings in the equipment, pumping on both suction and discharge sides
- PC8.**
 - check the oil level, fuel level, radiator coolant, air release valve and engine condition of a diesel operated pump and prime the same
 - .
- PC9.** understand the usages and installation of different valves pertaining to plumbing and water management

Operate the pump

To be competent, the user/individual on the job must be able to:

- PC10.** prepare a schedule for running the main pumps and the standby

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- PC11.** prime the centrifugal pump before start of operations before ensuring operation of the pump with full efficiency to improve output gain
- PC12.** operate the delivery valve; close bypass valves of reflux valve, sluice valve and butterfly valve; monitor sound, vibration, temperature and other related parameters to ensure smooth operation of the pump
- PC13.** check pump motor alignment and maintain input/output parameters
- PC14.** inspect the pump, related machinery and water supply system for faults, leaks, sparks, improper functioning, wear and tear or evidence of tampering
- PC15.** maintain a record of all pump operations timings, voltage, current, reading on gauges and flow meter, temperature, water level and any problem that occurred during the operations
- PC16.** perform operations on 3-Phase & Single-Phase Pump Operation Connections

Maintain the pump and related machinery

To be competent, the user/individual on the job must be able to:

- PC17.** identify, repair or replace sparking motors, leaking or worn out parts and tighten the foundation bolts
- PC18.** calibrate all vital instruments such as pressure gauge, vacuum gauge, ammeter, voltmeter, watt meters, frequency meter, tachometer and flow meter
- PC19.** conduct performance test of the pump discharge, head, efficiency and troubleshoot faults as per standard operating procedures
- PC20.** conduct various operations on pump control panel board for 3-phase and single phase pump

Maintain sump and storage tanks

To be competent, the user/individual on the job must be able to:

- PC21.** dewater, clean, disinfect and rinse sump and tank as per standard operating procedures
- PC22.** desilt the pump house area and perform leakage test to carry out rectification if needed

Maintain water meters and flow meters

To be competent, the user/individual on the job must be able to:

- PC23.** clean the dirt box or strainer and replace gaskets upon its wear and tear
- PC24.** prevent water seepage into the water meter and clean the chamber where the meter is installed
- PC25.** disassemble and reassemble the water meter for verification or repair
- PC26.** check the range, zero setting of the flow meter, inspect for bearing wear out and deposits in flow meter or corrosion of attached pipes
- PC27.** take action as per standard operating procedure to troubleshoot common faults in water meters and flow meters

Operate, maintain and repair pipelines and water treatment units

To be competent, the user/individual on the job must be able to:

- PC28.** operate water pipelines with required pressure by opening and shutting off the valves gradually
- PC29.** flush the system to clear sediments; service the valve chamber and valves; inspect the pipelines for damage, wear and tear, leakage, entrainment and water hammer and locate the leaks in the pipes
- PC30.** repair damaged pipelines and replace faulty parts like gaskets, valves joints and pipes that are not repairable

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- PC31.** start and shut off the filtration process and adjust the rate of filtration as needed by adding chemicals
- PC32.** inspect equipment on a regular basis to ensure proper functioning and adherence to safety standards; monitor operating conditions, meters, gauges and collect and test water and sewage samples
- PC33.** record meter, gauge readings, and operational data to operate equipment
- PC34.** clean and maintain equipment, tanks, filter beds and other work areas

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** standards, policies, and procedures followed in the company relevant to the task
- KU2.** workplace safety requirements, hazard reporting and handling procedures
- KU3.** various types of pumps used in residential, agricultural and commercial setups and their terminologies
- KU4.** components of pump systems and related equipment, tools and materials used and preparatory requirements for pump system installation
- KU5.** basic knowledge on saddle and ferrule connections in pumping apparatus
- KU6.** types of water supply and its implication on pumping system, performance measures, applications & properties of water pumps as per manufacturers' specifications
- KU7.** mathematical calculations, measurement of units, levelling and alignment procedures
- KU8.** different types of pumping apparatus (reciprocating, rotary etc.), valves and associated equipment ,gauges, dials, monitoring apparatus and their purposes
- KU9.** dos and don'ts of various pumping systems as per their Standard Operating Procedures (SOPs) specified by the manufacturer.
- KU10.** function and operation of various valves such as bypass valves of reflux valve, sluice valve and butterfly valve during operation of the pumps
- KU11.** common sounds, vibrations, temperature and other related parameters that can change during the operation of the pump and their significance.
- KU12.** impact of various physical parameters like temperature, pressure, etc. on the properties of final output
- KU13.** importance of maintaining a record of pump operation timings
- KU14.** various preventive maintenance tasks to be performed timely and considerations to be taken while making a preventive maintenance schedule
- KU15.** calibration procedure of all vital instruments such as pressure gauge, vacuum gauge, ammeter, voltmeter, watt meters, frequency meter, tachometer and flow meter
- KU16.** performance testing procedure of the pump for discharge, head and efficiency and action to be taken for common faults
- KU17.** overview of water distribution and storage systems at water supply stations
- KU18.** operational and maintenance requirements and procedures for sump and storage tanks, water meters and flow meters
- KU19.** rate of filtration and need for adjustment and chemicals used in the water treatment units
- KU20.** various meter and gauges and information to be gathered from them



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KU21. importance and procedure of water and sewage testing and maintaining records

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** prepare checklists, reports and fill out forms in local language or Hindi/English
- GS2.** perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS3.** establish priorities and deadlines in consultation with others and record them
- GS4.** plan one's daily tasks to achieve maximum productivity
- GS5.** be punctual and work as per agreed priorities
- GS6.** manage distractions and maintain workplace discipline
- GS7.** listen to customer's concerns and doubts carefully and address them
- GS8.** read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or English
- GS9.** state information, doubts and concerns about work related matters in local language or Hindi/English
- GS10.** be courteous and identify ways to increase productivity and reduce errors
- GS11.** breakdown relevant work process into its constituent activities for ease of analysis and identify ways to increase productivity and reduce error
- GS12.** establish workable solutions for problems in hand in consultation with others and record them

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Install pump and related equipment</i>	7	13	-	3.5
PC1. understand water supply and drainage systems in rural India	0.5	1	-	0.25
PC2. assemble pump components, equipment and prepare the tools, area and materials for the task as per Manufacturer's policy	0.5	1	-	0.25
PC3. locate and mark position for inlet and outlet supply connections of pump	1	2	-	0.5
PC4. fix the pump at the designated location as per instruction and connect the hoses of inlet and outlet supply to the pump	1	2	-	0.5
PC5. make provisions for electrical and other required connections	1	2	-	0.5
PC6. install and connect pump components without any damage to pump, fixture, pipe work and the surrounding environment followed by adjusting the pressure/flow as per required supply and demand	1	2	-	0.5
PC7. check for cracks, defects and anomalies in the pumping apparatus, condition of couplings in the equipment, pumping on both suction and discharge sides	1	2	-	0.5
PC8. • check the oil level, fuel level, radiator coolant, air release valve and engine condition of a diesel operated pump and prime the same • .	1	1	-	0.5
PC9. understand the usages and installation of different valves pertaining to plumbing and water management	-	-	-	-
<i>Operate the pump</i>	6	12	-	3
PC10. prepare a schedule for running the main pumps and the standby	1	2	-	0.5

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC11. prime the centrifugal pump before start of operations before ensuring operation of the pump with full efficiency to improve output gain	1	2	-	0.5
PC12. operate the delivery valve; close bypass valves of reflux valve, sluice valve and butterfly valve; monitor sound, vibration, temperature and other related parameters to ensure smooth operation of the pump	1	2	-	0.5
PC13. check pump motor alignment and maintain input/output parameters	1	2	-	0.5
PC14. inspect the pump, related machinery and water supply system for faults, leaks, sparks, improper functioning, wear and tear or evidence of tampering	1	2	-	0.5
PC15. maintain a record of all pump operations timings, voltage, current, reading on gauges and flow meter, temperature, water level and any problem that occurred during the operations	1	2	-	0.5
PC16. perform operations on 3-Phase & Single-Phase Pump Operation Connections	-	-	-	-
<i>Maintain the pump and related machinery</i>	3	4	-	1.5
PC17. identify, repair or replace sparking motors, leaking or worn out parts and tighten the foundation bolts	1	2	-	0.5
PC18. calibrate all vital instruments such as pressure gauge, vaccum gauge, ammeter, voltmeter, watt meters, frequency meter, tachometer and flow meter	1	1	-	0.5
PC19. conduct performance test of the pump discharge, head, efficiency and troubleshoot faults as per standard operating procedures	1	1	-	0.5
PC20. conduct various operations on pump control panel board for 3-phase and single phase pump	-	-	-	-
<i>Maintain sump and storage tanks</i>	2	4	-	1
PC21. dewater, clean, disinfect and rinse sump and tank as per standard operating procedures	1	2	-	0.5

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC22. desilt the pump house area and perform leakage test to carry out rectification if needed	1	2	-	0.5
<i>Maintain water meters and flow meters</i>	5	9	-	2.5
PC23. clean the dirt box or strainer and replace gaskets upon its wear and tear	1	2	-	0.5
PC24. prevent water seepage into the water meter and clean the chamber where the meter is installed	1	2	-	0.5
PC25. disassemble and reassemble the water meter for verification or repair	1	2	-	0.5
PC26. check the range, zero setting of the flow meter, inspect for bearing wear out and deposits in flow meter or corrosion of attached pipes	1	2	-	0.5
PC27. take action as per standard operating procedure to troubleshoot common faults in water meters and flow meters	1	1	-	0.5
<i>Operate, maintain and repair pipelines and water treatment units</i>	7	13	-	3.5
PC28. operate water pipelines with required pressure by opening and shutting off the valves gradually	1	2	-	0.5
PC29. flush the system to clear sediments; service the valve chamber and valves; inspect the pipelines for damage, wear and tear, leakage, entrainment and water hammer and locate the leaks in the pipes	1	2	-	0.5
PC30. repair damaged pipelines and replace faulty parts like gaskets, valves joints and pipes that are not repairable	1	2	-	0.5
PC31. start and shut off the filtration process and adjust the rate of filtration as needed by adding chemicals	1	2	-	0.5

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC32. inspect equipment on a regular basis to ensure proper functioning and adherence to safety standards; monitor operating conditions, meters, gauges and collect and test water and sewage samples	1	2	-	0.5
PC33. record meter, gauge readings, and operational data to operate equipment	1	2	-	0.5
PC34. clean and maintain equipment, tanks, filter beds and other work areas	1	1	-	0.5
NOS Total	30	55	-	15



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0166
NOS Name	Perform Installation, Operation and Maintenance of Pumps and Related Machinery at Water Supply Stations and Water Treatment Units
Sector	Plumbing
Sub-Sector	Water Supply & Water Treatment & Quality Control
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	2
Version	1.0
Last Reviewed Date	NA
Next Review Date	13/06/2026
NSQC Clearance Date	13/06/2023

Qualification Pack

PSC/N0175: Perform basic installation of electrical fixtures and temporary LV connections

Description

This unit covers the installation of electrical fixtures and temporary low voltage (LV) connections, which is done by assessing the location and gather necessary tools and materials. This unit also covers the connection the LV cables using wire nuts and strip the wires as needed and mounting the fixture securely, ensuring proper alignment.

Scope

The scope covers the following :

- Identify the tools
- Prepare for setup
- Installation of electrical fixtures
- Installation and maintenance of temporary LV connection
- Electrical maintenance and troubleshooting

Elements and Performance Criteria

Identify the tools

To be competent, the user/individual on the job must be able to:

- PC1.** identify the roles and responsibilities of an electrician
- PC2.** ensure the electrical, hand and power tools are in good working condition
- PC3.** ensure the safe storage of tools after and before use
- PC4.** perform cleaning of the tools with the help of brush reaked in oil, grease and dust

Prepare for setup

To be competent, the user/individual on the job must be able to:

- PC5.** perform visual checks to the house wiring
- PC6.** identify electrical material requirements based on electrical fittings and layouts
- PC7.** identify the protecting device
- PC8.** able to identify the types of cable with colour coding, type of wire, neutral, earth, phase
- PC9.** check for quality, brand, gauge, specifications of wiring fixtures
- PC10.** read and interpret single phase wiring diagram
- PC11.** carry out necessary measurements of cables
- PC12.** carry out marking on wall
- PC13.** assist in planning and mark locations of raceways and electrical fixtures
- PC14.** carry out drilling, cutting works as and when necessary

Installation of electrical fixtures

To be competent, the user/individual on the job must be able to:

- PC15.** identify the types of conduits and fixtures for installation

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- PC16.** install electrical fixtures, fittings (such as DBs, switch boards, switches, sockets, lights and wall brackets) at specified locations
- PC17.** carry out termination of cables as per standard practice
- PC18.** perform necessary tests to ensure safe condition of electrical circuit during and post wiring activity using appropriate tools
- PC19.** ensure the temporary lightning arrangement is being carried out with the help of required tools.
- PC20.** measure earth resistance and leakage as per requirement, using appropriate electrical devices.
- PC21.** carry out electrical earthing work adopting standard procedure and using appropriate earthing components as per instructions
- PC22.** install earthing strips by embedding in concrete, screwing, bolting or by welding in high-rise structures

Installation and maintenance of temporary LV connection

To be competent, the user/individual on the job must be able to:

- PC23.** establish new LV connection as per circuit load requirement
- PC24.** ensure the temporary panel/db is connected with main power outlet.
- PC25.** carry out installation of flexible conduit pipes through RCC structures or through chased wall surface as per instructions
- PC26.** identify and install protective devices of correct power rating, at appropriate locations of wiring

Electrical maintenance and troubleshooting

To be competent, the user/individual on the job must be able to:

- PC27.** able to perform quality check for domestic electrical wiring and temporary panels
- PC28.** adhere to electrical safety norms and act/ report efficiently on detection of any unsafe situation
- PC29.** identify the faults with lightning arrangement
- PC30.** replace faulty electrical fixtures, fittings, LV wiring as and when necessary

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** standard practices for electrical wiring
- KU2.** rules and regulations for handling and storing required electrical tools, equipment and materials safely.
- KU3.** personal protection including the use of related safety gears & equipment
- KU4.** guidelines provided in Indian Standard code of practice applicable to electrical wiring works
- KU5.** guidelines provided by ISI for LV wiring operations
- KU6.** able to read and interpret electrical drawings, circuit diagrams and/or related schematics for single and three phase lv house wiring system
- KU7.** estimate required material quantity



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- KU8.** manufacturer guidelines for use of hand and power tools and measuring devices and electrical fitting fixtures
- KU9.** three phases single phase connections as per electrical drawing.
- KU10.** specification, color coding of different components used in electrical earthing work
- KU11.** principle of different methods of earthing i.e. pipe, plate, etc.
- KU12.** protective devices like fire alarm, MCB, ELCB, MCCB
- KU13.** current tentative market rate of common electrical items
- KU14.** common electrical brands and their products
- KU15.** standard house wiring procedure and best practices
- KU16.** right procedure of handling of electrical fixtures
- KU17.** use of ladders, scaffolds, PPEs, shock resistance gloves during working in a live circuit
- KU18.** use of different common electrical hand and power tools like different pliers, earth tester, tong tester, voltage tester, multimeter, etc
- KU19.** standard procedure of storing, stacking electrical material, tools and equipment at workplace

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** Prepare checklists, reports and fill out forms in local language or Hindi/English
- GS2.** Understand the various colour codes, as per standard electrical, mechanical and civil nomenclature.
- GS3.** Ability to read from different sources- books screens in machines and signage
- GS4.** Perform arithmetic calculations of addition, subtraction, multiplication and division processes
- GS5.** Read and interpret information (symbols, dimensions, terminology, dates etc.) given in local language or Hindi
- GS6.** State information, doubts and concerns about work related matters in local language or Hindi/English
- GS7.** Plan one's daily tasks to achieve maximum efficiency
- GS8.** Be punctual and work as per agreed priorities
- GS9.** Manage distractions and maintain workplace discipline
- GS10.** Listen to the higher authorities carefully
- GS11.** Be courteous
- GS12.** Identify ways to increase efficiency and reduce errors
- GS13.** Read and understand manuals, health and safety instructions, memos, other company documents.
- GS14.** Communicate with supervisor

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Identify the tools</i>	4	7	-	2
PC1. identify the roles and responsibilities of an electrician	1	2	-	0.5
PC2. ensure the electrical, hand and power tools are in good working condition	1	2	-	0.5
PC3. ensure the safe storage of tools after and before use	1	1.5	-	0.5
PC4. perform cleaning of the tools with the help of brush reaked in oil, grease and dust	1	1.5	-	0.5
<i>Prepare for setup</i>	10	17	-	7.5
PC5. perform visual checks to the house wiring	1	2	-	1
PC6. identify electrical material requirements based on electrical fittings and layouts	1	2	-	1
PC7. identify the protecting device	1	2	-	1
PC8. able to identify the types of cable with colour coding, type of wire, neutral, earth, phase	1	2	-	1
PC9. check for quality, brand, gauge, specifications of wiring fixtures	1	2	-	1
PC10. read and interpret single phase wiring diagram	1	2	-	0.5
PC11. carry out necessary measurements of cables	1	2	-	0.5
PC12. carry out marking on wall	1	1	-	0.5
PC13. assist in planning and mark locations of raceways and electrical fixtures	1	1	-	0.5
PC14. carry out drilling, cutting works as and when necessary	1	1	-	0.5
<i>Installation of electrical fixtures</i>	8	14	-	5.5

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC15. identify the types of conduits and fixtures for installation	1	2	-	1
PC16. install electrical fixtures, fittings (such as DBs, switch boards, switches, sockets, lights and wall brackets) at specified locations	1	2	-	1
PC17. carry out termination of cables as per standard practice	1	2	-	1
PC18. perform necessary tests to ensure safe condition of electrical circuit during and post wiring activity using appropriate tools	1	2	-	0.5
PC19. ensure the temporary lightning arrangement is being carried out with the help of required tools.	1	2	-	0.5
PC20. measure earth resistance and leakage as per requirement, using appropriate electrical devices.	1	2	-	0.5
PC21. carry out electrical earthing work adopting standard procedure and using appropriate earthing components as per instructions	1	1	-	0.5
PC22. install earthing strips by embedding in concrete, screwing, bolting or by welding in high-rise structures	1	1	-	0.5
<i>Installation and maintenance of temporary LV connection</i>	4	6	-	3
PC23. establish new LV connection as per circuit load requirement	1	2	-	1
PC24. ensure the temporary panel/db is connected with main power outlet.	1	2	-	1
PC25. carry out installation of flexible conduit pipes through RCC structures or through chased wall surface as per instructions	1	1	-	0.5
PC26. identify and install protective devices of correct power rating, at appropriate locations of wiring	1	1	-	0.5

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Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Electrical maintenance and troubleshooting</i>	4	6	-	2
PC27. able to perform quality check for domestic electrical wiring and temporary panels	1	2	-	0.5
PC28. adhere to electrical safety norms and act/report efficiently on detection of any unsafe situation	1	2	-	0.5
PC29. identify the faults with lightning arrangement	1	1	-	0.5
PC30. replace faulty electrical fixtures, fittings, LV wiring as and when necessary	1	1	-	0.5
NOS Total	30	50	-	20



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0175
NOS Name	Perform basic installation of electrical fixtures and temporary LV connections
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing
Occupation	Plumbing Systems Installation and Maintenance, Material Handling
NSQF Level	4
Credits	4
Version	1.0
Last Reviewed Date	NA
Next Review Date	13/06/2026
NSQC Clearance Date	13/06/2023

Qualification Pack

PSC/N0136: Apply Health and Safety Practices at the Workplace

Description

This unit is about practices to be executed at the workplace which is crucial for creating a safe and secure working environment that promotes the well-being of employees and minimizes the risk of accidents, injuries, and occupational illnesses. Here's a description outlining the key aspects of implementing health and safety practices at the workplace.

Scope

The scope covers the following :

- Follow safety measures to avoid accidents
- Daily inspection of tools and equipment
- Deal with emergencies

Elements and Performance Criteria

Follow safety measures to avoid accidents

To be competent, the user/individual on the job must be able to:

- PC1.** identify risks and hazards at the workplace
- PC2.** wear personal protective equipment (PPE) as per the type of plumbing work
- PC3.** place protective barricades and signages around the pits and trenches
- PC4.** isolate the plumbing fittings and fixtures from electrical wiring to avoid accidents
- PC5.** adhere to organisational procedures for reporting hazards and incidents to relevant authorities
- PC6.** establish ventilation before entering underground work areas
- PC7.** work safely in and around trenches, elevated places and confined areas
- PC8.** ensure tools and hazardous materials are not left unattended
- PC9.** ensure good housekeeping in order to prevent hazards e.g. fire
- PC10.** dispose waste materials and used PPE according to regulations and codes of practice

Follow hygiene and sanitation practices

To be competent, the user/individual on the job must be able to:

- PC11.** follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing etc.
- PC12.** clean and disinfect work area, materials/supplies, equipment etc. before and after use.
- PC13.** report hygiene and sanitation issues to appropriate authority

Use tools, equipment and materials safely

To be competent, the user/individual on the job must be able to:

- PC14.** check that the tools, equipment and materials are in good condition and as per industry standards before use
- PC15.** use power tools and machinery that are grounded
- PC16.** replace or repair split or loose tools before use



Qualification Pack

PC17. store and transport various plumbing materials safely

Deal with emergencies

To be competent, the user/individual on the job must be able to:

PC18. follow workplace emergency and evacuation procedures

PC19. use a fire extinguisher correctly

PC20. use safe methods to free a person from electrocution

PC21. administer appropriate first aid (such as CPR etc.) to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. possible causes of risk, hazard or accident in the workplace

KU2. organisational procedures for upkeep of tools and plumbing materials, health and safety

KU3. location of all the general health and safety equipment in the workplace

KU4. meaning of hazards and risks

KU5. hazardous environment encountered during work such as underground areas, elevated areas, areas with water and electricity supply, presence of biological waste, under construction sites etc.

KU6. work practices and precautions to control and prevent risks, hazards and accidents

KU7. importance of each personal protective equipment used such as eye protection mask, hard hats, gloves, apron, rubber boots etc.

KU8. tools and plumbing equipment as per latest industry standards

KU9. preventative and remedial actions to be taken in case of exposure to toxic materials

KU10. specific safety and health related problems faced in domestic, commercial and institutional setups

KU11. various causes of fire and precautionary activities to prevent the fire accident

KU12. techniques of using the different fire extinguishers

KU13. rescue techniques applied during a fire hazard

KU14. various types of safety signs and meaning

KU15. appropriate basic first aid treatment relevant to the condition e.g. shock, electrical shock, bleeding, minor burns, poisoning, eye injuries etc.

KU16. potential injuries and ill health associated with incorrect handling of tools and equipment

Generic Skills (GS)

User/individual on the job needs to know how to:

GS1. write an accident/incident report in local language or English

GS2. read and comprehend labels, charts, signages, manuals, plumbing symbols etc.

GS3. question coworkers appropriately in order to clarify instructions and other issues



Qualification Pack

- GS4.** plan and organize the work schedule, work area, tools, equipment and materials for improved productivity
- GS5.** determine key considerations and priorities when faced with problems
- GS6.** seek official and authorised sources of help and guidance to resolve problems that cannot be solved at one's level of authority

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Follow safety measures to avoid accidents</i>	12	32	-	5
PC1. identify risks and hazards at the workplace	1	2	-	0.5
PC2. wear personal protective equipment (PPE) as per the type of plumbing work	1	2	-	0.5
PC3. place protective barricades and signages around the pits and trenches	1	4	-	0.5
PC4. isolate the plumbing fittings and fixtures from electrical wiring to avoid accidents	1	4	-	0.5
PC5. adhere to organisational procedures for reporting hazards and incidents to relevant authorities	1	4	-	0.5
PC6. establish ventilation before entering underground work areas	1	4	-	0.5
PC7. work safely in and around trenches, elevated places and confined areas	1	3	-	0.5
PC8. ensure tools and hazardous materials are not left unattended	1	3	-	0.5
PC9. ensure good housekeeping in order to prevent hazards e.g. fire	2	3	-	0.5
PC10. dispose waste materials and used PPE according to regulations and codes of practice	2	3	-	0.5
<i>Follow hygiene and sanitation practices</i>	3	8	-	2
PC11. follow recommended personal hygiene and sanitation practices, for example, washing/sanitizing hands, covering face with a bent elbow while coughing/sneezing etc.	1	3	-	1
PC12. clean and disinfect work area, materials/supplies, equipment etc. before and after use.	1	3	-	0.5
PC13. report hygiene and sanitation issues to appropriate authority	1	2	-	0.5

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Use tools, equipment and materials safely</i>	7	8	-	1
PC14. check that the tools, equipment and materials are in good condition and as per industry standards before use	2	2	-	0.25
PC15. use power tools and machinery that are grounded	2	2	-	0.25
PC16. replace or repair split or loose tools before use	1	2	-	0.25
PC17. store and transport various plumbing materials safely	2	2	-	0.25
<i>Deal with emergencies</i>	8	12	-	2
PC18. follow workplace emergency and evacuation procedures	2	3	-	0.5
PC19. use a fire extinguisher correctly	2	3	-	0.5
PC20. use safe methods to free a person from electrocution	2	3	-	0.5
PC21. administer appropriate first aid (such as CPR etc.) to victims in case of cuts, bleeding, burns, choking, electric shock, poisoning etc.	2	3	-	0.5
NOS Total	30	60	-	10



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0136
NOS Name	Apply Health and Safety Practices at the Workplace
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing, Water Supply & Water Treatment & Quality Control, Sewerage & Sewage Treatment, Drainage, Water Harvesting & Ground Recharging, Firefighting & Safety Systems, Gas & Piping (Industrial / Medical), HVAC & Steam, Manufacturing of Plumbing / Firefighting Products, Micro-Hydel Power
Occupation	Plumbing Systems Installation and Maintenance, Designing, Sales, Material Handling, Plumbing Servicing, Plumbing Plant Operations
NSQF Level	4
Credits	0.5
Version	2.0
Last Reviewed Date	18/02/2025
Next Review Date	18/02/2028
NSQF Clearance Date	18/02/2025

Qualification Pack

PSC/N0149: Assist Village Water Sanitation Committees (VWSCs) to Conduct Water Quality Survey

Description

This unit deals in detail with certain tasks performed by the Jal Mitra in co-ordination with village community members, committees and gram panchayat. The tasks relate to scheme planning, social mobilization and enhancing community ownership for the adoption and implementation of Jal Jeevan Mission and its associated elements like water conservation, efficient water usage practices, sustainability of piped water schemes and conduct water quality surveying.

Scope

The scope covers the following :

- Gather data and provide inputs required for planning of the scheme
- Mobilize participation of communities and enhance their ownership
- Maintain the quality of water by various techniques as per given standards

Elements and Performance Criteria

Gather data and provide inputs required for planning of the scheme

To be competent, the user/individual on the job must be able to:

- PC1.** conduct survey to estimate the water requirements in consultation with the Village Water and Sanitation Committee (VWSC)
- PC2.** undertake drinking water quality tests for the geographic area
- PC3.** collate information for water budgeting and water quality mapping
- PC4.** identify location in the community where water quality boards can be put up
- PC5.** collate community related data and suggestions for water conservation, grey water re-use and water usage efficiency potential
- PC6.** verify data and information collected before handover to the relevant authorities
- PC7.** provide suggestions for creating tools and techniques that will engage the community members

Mobilize participation of communities and enhance their ownership

To be competent, the user/individual on the job must be able to:

- PC8.** conduct stakeholder analysis
- PC9.** enroll communities to participate in various schemes for water conservation and water usage efficiency practices
- PC10.** co-ordinate with the village committees and gram panchayat for implementation of schemes for water conservation and efficient water usage
- PC11.** setup water quality board at gram panchayat for ensuring planning, cleaning and maintenance of water harvesting structures
- PC12.** facilitate the creation of a roadmap for Participatory Rural Appraisal (PRA) activities
- PC13.** engage communities through various tools of Participatory Rural Appraisal (PRA) in co-ordination with village committees and gram panchayat



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- PC14.** ensure participation of diverse social groups of the village from different religions, castes and age groups for triangulation
- PC15.** initiate dialogue and discussion between community members to find solutions on critical issues like health, sanitation, hygiene, etc.
- PC16.** promote campaigns by conducting workshops, distributing flyers, organising rallies and other awareness building activities
- PC17.** impart training to various local level stakeholders for use and care of the systems and structures installed

Maintain the quality of water by various techniques as per given standards

To be competent, the user/individual on the job must be able to:

- PC18.** identify the correct method of water sampling according to the standard operating procedure
- PC19.** obtain the water sample from the source and send samples for laboratory testing
- PC20.** test the water sample for its quality using the water testing kits
- PC21.** identify the TDS level and pH of the water
- PC22.** identify for fecal contamination and heavy metals composition in water
- PC23.** check for the various color coding in kit to ensure the different water quality parameters
- PC24.** perform the various tests with the help of water quality testing
- PC25.** share the water quality testing result with the appropriate higher authorities
- PC26.** ensure that the quality of water is not preceding the water quality standards as per government guidelines.

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

- KU1.** various water conservation and efficient water usage solutions and schemes
- KU2.** data and information required for planning various water conservation and efficient water usage solutions and schemes and how to obtain that data
- KU3.** importance of data verification and data triangulation
- KU4.** basic water quality mapping and water budgeting concepts and practices
- KU5.** role of community and importance of mobilizing community members for successful implementation of water conservation and efficient water usage practices and schemes
- KU6.** stakeholders involved in selection and implementation of water conservation and efficient water usage solutions and schemes
- KU7.** how to conduct PRAs, structure and roles and responsibilities of VWSCs and other rural committees
- KU8.** social and behavioural change required at the community level
- KU9.** various types of campaigns and campaign activities
- KU10.** key messages for awareness building of community members and other stakeholders
- KU11.** cleaning and maintenance of water conservation structures

Generic Skills (GS)



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User/individual on the job needs to know how to:

- GS1.** read and write common information from water quality reports, campaign related published materials, etc.
- GS2.** fill in relevant forms for data collation and sharing
- GS3.** co-ordinate with community members, committees and gram panchayats
- GS4.** plan the work activities in a flow to minimize the inconvenience of others i.e. co-workers, users.
- GS5.** plan work activities and communicate to others whose work plans and timelines may be affected
- GS6.** identify the objectives, concerns and priorities of the user and client
- GS7.** apply problem solving skills
- GS8.** work in a disciplined and focused manner
- GS9.** communicate and discuss work flow related difficulties and problems in order to find out solution from official authorities that can't be solved at one's level of authority

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Gather data and provide inputs required for planning of the scheme</i>	7	14	-	6
PC1. conduct survey to estimate the water requirements in consultation with the Village Water and Sanitation Committee (VWSC)	1	2	-	1
PC2. undertake drinking water quality tests for the geographic area	1	2	-	1
PC3. collate information for water budgeting and water quality mapping	1	2	-	1
PC4. identify location in the community where water quality boards can be put up	1	2	-	1
PC5. collate community related data and suggestions for water conservation, grey water re-use and water usage efficiency potential	1	2	-	1
PC6. verify data and information collected before handover to the relevant authorities	1	2	-	0.5
PC7. provide suggestions for creating tools and techniques that will engage the community members	1	2	-	0.5
<i>Mobilize participation of communities and enhance their ownership</i>	10	19	-	5
PC8. conduct stakeholder analysis	1	2	-	0.5
PC9. enroll communities to participate in various schemes for water conservation and water usage efficiency practices	1	2	-	0.5
PC10. co-ordinate with the village committees and gram panchayat for implementation of schemes for water conservation and efficient water usage	1	2	-	0.5
PC11. setup water quality board at gram panchayat for ensuring planning, cleaning and maintenance of water harvesting structures	1	2	-	0.5
PC12. facilitate the creation of a roadmap for Participatory Rural Appraisal (PRA) activities	1	2	-	0.5

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC13. engage communities through various tools of Participatory Rural Appraisal (PRA) in co-ordination with village committees and gram panchayat	1	2	-	0.5
PC14. ensure participation of diverse social groups of the village from different religions, castes and age groups for triangulation	1	2	-	0.5
PC15. initiate dialogue and discussion between community members to find solutions on critical issues like health, sanitation, hygiene, etc.	1	2	-	0.5
PC16. promote campaigns by conducting workshops, distributing flyers, organising rallies and other awareness building activities	1	2	-	0.5
PC17. impart training to various local level stakeholders for use and care of the systems and structures installed	1	1	-	0.5
<i>Maintain the quality of water by various techniques as per given standards</i>	13	17	-	9
PC18. identify the correct method of water sampling according to the standard operating procedure	1.5	2	-	1
PC19. obtain the water sample from the source and send samples for laboratory testing	1.5	2	-	1
PC20. test the water sample for its quality using the water testing kits	1.5	2	-	1
PC21. identify the TDS level and pH of the water	1.5	2	-	1
PC22. identify for fecal contamination and heavy metals composition in water	1.5	2	-	1
PC23. check for the various color coding in kit to ensure the different water quality parameters	1.5	2	-	1
PC24. perform the various tests with the help of water quality testing	1.5	2	-	1
PC25. share the water quality testing result with the appropriate higher authorities	1	1	-	1



Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC26. ensure that the quality of water is not preceding the water quality standards as per government guidelines.	1.5	2	-	1
NOS Total	30	50	-	20



Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	PSC/N0149
NOS Name	Assist Village Water Sanitation Committees (VWSCs) to Conduct Water Quality Survey
Sector	Plumbing
Sub-Sector	Industrial / Non-Industrial Plumbing, Water Supply & Water Treatment & Quality Control
Occupation	Plumbing Systems Installation and Maintenance
NSQF Level	4
Credits	1.5
Version	2.0
Last Reviewed Date	NA
Next Review Date	13/06/2026
NSQC Clearance Date	13/06/2023



Qualification Pack

DGT/VSQ/N0101: Employability Skills (30 Hours)

Description

This unit is about employability skills, Constitutional values, becoming a professional in the 21st Century, digital, financial, and legal literacy, diversity and Inclusion, English and communication skills, customer service, entrepreneurship, and apprenticeship, getting ready for jobs and career development.

Scope

The scope covers the following :

- Introduction to Employability Skills
- Constitutional values - Citizenship
- Becoming a Professional in the 21st Century
- Basic English Skills
- Communication Skills
- Diversity & Inclusion
- Financial and Legal Literacy
- Essential Digital Skills
- Entrepreneurship
- Customer Service
- Getting ready for Apprenticeship & Jobs

Elements and Performance Criteria

Introduction to Employability Skills

To be competent, the user/individual on the job must be able to:

PC1. understand the significance of employability skills in meeting the job requirements

Constitutional values - Citizenship

To be competent, the user/individual on the job must be able to:

PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices

Becoming a Professional in the 21st Century

To be competent, the user/individual on the job must be able to:

PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.

Basic English Skills

To be competent, the user/individual on the job must be able to:

PC4. speak with others using some basic English phrases or sentences

Communication Skills

To be competent, the user/individual on the job must be able to:

PC5. follow good manners while communicating with others

PC6. work with others in a team



Qualification Pack

Diversity & Inclusion

To be competent, the user/individual on the job must be able to:

PC7. communicate and behave appropriately with all genders and PwD

PC8. report any issues related to sexual harassment

Financial and Legal Literacy

To be competent, the user/individual on the job must be able to:

PC9. use various financial products and services safely and securely

PC10. calculate income, expenses, savings etc.

PC11. approach the concerned authorities for any exploitation as per legal rights and laws

Essential Digital Skills

To be competent, the user/individual on the job must be able to:

PC12. operate digital devices and use its features and applications securely and safely

PC13. use internet and social media platforms securely and safely

Entrepreneurship

To be competent, the user/individual on the job must be able to:

PC14. identify and assess opportunities for potential business

PC15. identify sources for arranging money and associated financial and legal challenges

Customer Service

To be competent, the user/individual on the job must be able to:

PC16. identify different types of customers

PC17. identify customer needs and address them appropriately

PC18. follow appropriate hygiene and grooming standards

Getting ready for apprenticeship & Jobs

To be competent, the user/individual on the job must be able to:

PC19. create a basic biodata

PC20. search for suitable jobs and apply

PC21. identify and register apprenticeship opportunities as per requirement

Knowledge and Understanding (KU)

The individual on the job needs to know and understand:

KU1. need for employability skills

KU2. various constitutional and personal values

KU3. different environmentally sustainable practices and their importance

KU4. Twenty first (21st) century skills and their importance

KU5. how to use basic spoken English language

KU6. Do and dont of effective communication

KU7. inclusivity and its importance

KU8. different types of disabilities and appropriate communication and behaviour towards PwD

KU9. different types of financial products and services



Qualification Pack

- KU10.** how to compute income and expenses
- KU11.** importance of maintaining safety and security in financial transactions
- KU12.** different legal rights and laws
- KU13.** how to operate digital devices and applications safely and securely
- KU14.** ways to identify business opportunities
- KU15.** types of customers and their needs
- KU16.** how to apply for a job and prepare for an interview
- KU17.** apprenticeship scheme and the process of registering on apprenticeship portal

Generic Skills (GS)

User/individual on the job needs to know how to:

- GS1.** communicate effectively using appropriate language
- GS2.** behave politely and appropriately with all
- GS3.** perform basic calculations
- GS4.** solve problems effectively
- GS5.** be careful and attentive at work
- GS6.** use time effectively
- GS7.** maintain hygiene and sanitisation to avoid infection

Qualification Pack

Assessment Criteria

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
<i>Introduction to Employability Skills</i>	1	1	-	-
PC1. understand the significance of employability skills in meeting the job requirements	-	-	-	-
<i>Constitutional values - Citizenship</i>	1	1	-	-
PC2. identify constitutional values, civic rights, duties, personal values and ethics and environmentally sustainable practices	-	-	-	-
<i>Becoming a Professional in the 21st Century</i>	1	3	-	-
PC3. explain 21st Century Skills such as Self-Awareness, Behavior Skills, Positive attitude, self-motivation, problem-solving, creative thinking, time management, social and cultural awareness, emotional awareness, continuous learning mindset etc.	-	-	-	-
<i>Basic English Skills</i>	2	3	-	-
PC4. speak with others using some basic English phrases or sentences	-	-	-	-
<i>Communication Skills</i>	1	1	-	-
PC5. follow good manners while communicating with others	-	-	-	-
PC6. work with others in a team	-	-	-	-
<i>Diversity & Inclusion</i>	1	1	-	-
PC7. communicate and behave appropriately with all genders and PwD	-	-	-	-
PC8. report any issues related to sexual harassment	-	-	-	-
<i>Financial and Legal Literacy</i>	3	4	-	-
PC9. use various financial products and services safely and securely	-	-	-	-

Qualification Pack

Assessment Criteria for Outcomes	Theory Marks	Practical Marks	Project Marks	Viva Marks
PC10. calculate income, expenses, savings etc.	-	-	-	-
PC11. approach the concerned authorities for any exploitation as per legal rights and laws	-	-	-	-
<i>Essential Digital Skills</i>	4	6	-	-
PC12. operate digital devices and use its features and applications securely and safely	-	-	-	-
PC13. use internet and social media platforms securely and safely	-	-	-	-
<i>Entrepreneurship</i>	3	5	-	-
PC14. identify and assess opportunities for potential business	-	-	-	-
PC15. identify sources for arranging money and associated financial and legal challenges	-	-	-	-
<i>Customer Service</i>	2	2	-	-
PC16. identify different types of customers	-	-	-	-
PC17. identify customer needs and address them appropriately	-	-	-	-
PC18. follow appropriate hygiene and grooming standards	-	-	-	-
<i>Getting ready for apprenticeship & Jobs</i>	1	3	-	-
PC19. create a basic biodata	-	-	-	-
PC20. search for suitable jobs and apply	-	-	-	-
PC21. identify and register apprenticeship opportunities as per requirement	-	-	-	-
NOS Total	20	30	-	-

Qualification Pack

National Occupational Standards (NOS) Parameters

NOS Code	DGT/VSQ/N0101
NOS Name	Employability Skills (30 Hours)
Sector	Cross Sectoral
Sub-Sector	Professional Skills
Occupation	Employability
NSQF Level	2
Credits	1
Version	1.0
Last Reviewed Date	08/05/2025
Next Review Date	30/04/2028
NSQC Clearance Date	08/05/2025

Assessment Guidelines and Assessment Weightage

Assessment Guidelines

1. Criteria for assessment for each Qualification Pack will be created by the Sector Skill Council. Each Performance Criteria (PC) will be assigned marks proportional to its importance in NOS. SSC will also lay down the proportion of marks for Theory and Skills Practical for each PC.
2. The assessment for the theory part will be based on the knowledge bank of questions created by the SSC.
3. Assessment will be conducted for all compulsory NOS, and where applicable, on the selected elective/option NOS/set of NOS.
4. Individual assessment agencies will create unique question papers for the theory part for each candidate at each examination/training center (as per assessment criteria below).
5. Individual assessment agencies will create unique evaluations for skill practical for every student at each examination/ training center based on these criteria.
6. To pass the Qualification Pack assessment, every trainee should score a minimum of 60% of % aggregate marks to successfully clear the assessment.

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7. In case of unsuccessful completion, the trainee may seek reassessment on the Qualification Pack.

Minimum Aggregate Passing % at QP Level : 60

(Please note: Every Trainee should score a minimum aggregate passing percentage as specified above, to successfully clear the Qualification Pack assessment.)

Assessment Weightage

Compulsory NOS

National Occupational Standards	Theory Marks	Practical Marks	Project Marks	Viva Marks	Total Marks	Weightage
PSC/N0163.Installation and Operations of Plumbing and Water Management Systems	30	55	0	15	100	20
PSC/N0174.Carry out associated Basic Masonry and Manhole Construction Work	30	50	0	20	100	20
PSC/N0166.Perform Installation, Operation and Maintenance of Pumps and Related Machinery at Water Supply Stations and Water Treatment Units	30	55	0	15	100	20
PSC/N0175.Perform basic installation of electrical fixtures and temporary LV connections	30	50	0	20	100	20
PSC/N0136.Apply Health and Safety Practices at the Workplace	30	60	0	10	100	10
PSC/N0149.Assist Village Water Sanitation Committees (VWSCs) to Conduct Water Quality Survey	30	50	0	20	100	5
DGT/VSQ/N0101.Employability Skills (30 Hours)	20	30	-	-	50	5
Total	200	350	-	100	650	100



Qualification Pack

Acronyms

NOS	National Occupational Standard(s)
NSQF	National Skills Qualifications Framework
QP	Qualifications Pack
TVET	Technical and Vocational Education and Training
NCVET	National Council for Vocational Education and Training
WMPSC	Water Management and Plumbing Skill Council
QP	Qualification Pack
MC	Model Curriculum
NSQF	National Skills Qualification Framework
NSQC	National Skills Qualification Committee
NOS	National Occupational Standards
NCO	National Classification of Occupations
ES	Employability Skills

Qualification Pack

Glossary

Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests.
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components.
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry.
Job role	Job role defines a unique set of functions that together form a unique employment opportunity in an organisation.
Occupational Standards (OS)	OS specify the standards of performance an individual must achieve when carrying out a function in the workplace, together with the Knowledge and Understanding (KU) they need to meet that standard consistently. Occupational Standards are applicable both in the Indian and global contexts.
Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task.
National Occupational Standards (NOS)	NOS are occupational standards which apply uniquely in the Indian context.
Qualifications Pack (QP)	QP comprises the set of OS, together with the educational, training and other criteria required to perform a job role. A QP is assigned a unique qualifications pack code.
Unit Code	Unit code is a unique identifier for an Occupational Standard, which is denoted by an 'N'
Unit Title	Unit title gives a clear overall statement about what the incumbent should be able to do.
Description	Description gives a short summary of the unit content. This would be helpful to anyone searching on a database to verify that this is the appropriate OS they are looking for.
Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required.

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Knowledge and Understanding (KU)	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard.
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility.
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities.
Core Skills/ Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles.
Electives	Electives are NOS/set of NOS that are identified by the sector as contributive to specialization in a job role. There may be multiple electives within a QP for each specialized job role. Trainees must select at least one elective for the successful completion of a QP with Electives.
Options	Options are NOS/set of NOS that are identified by the sector as additional skills. There may be multiple options within a QP. It is not mandatory to select any of the options to complete a QP with Options.
Sector	Sector is a conglomeration of different business operations having similar business and interests. It may also be defined as a distinct subset of the economy whose components share similar characteristics and interests
Sub-sector	Sub-sector is derived from a further breakdown based on the characteristics and interests of its components
Occupation	Occupation is a set of job roles, which perform similar/ related set of functions in an industry
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Performance Criteria (PC)	Performance Criteria (PC) are statements that together specify the standard of performance required when carrying out a task

Qualification Pack

National Occupational Standard	National Occupational Standard (NOS) are occupational standards which apply uniquely in the Indian context
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Scope	Scope is a set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on quality of performance required
Knowledge and Understanding	Knowledge and Understanding (KU) are statements which together specify the technical, generic, professional and organisational specific knowledge that an individual needs in order to perform to the required standard
Organisational Context	Organisational context includes the way the organisation is structured and how it operates, including the extent of operative knowledge managers have of their relevant areas of responsibility
Technical Knowledge	Technical knowledge is the specific knowledge needed to accomplish specific designated responsibilities
Generic Skills (GS)	Core skills or Generic Skills (GS) are a group of skills that are the key to learning and working in today's world. These skills are typically needed in any work environment in today's world. These skills are typically needed in any work environment. In the context of the OS, these include communication related skills that are applicable to most job roles
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