ELMS

Establishing an Employer led

Labour Market Secretariat

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Nepal Industrial and Business Sector

Occupational Standard (OS)

of

Plumber Level-2

In jointly implemented by

Occupational classification linkage with NSCO

Occupational Title:	**Plumber**
Level:	**2 (Foreman Level)**
Sector:	**Construction**
Sub – Sector:	**Associated to construction**
OS ID No:	**CT-010-078**
Major Group:	**7**
Sub-major Group:	**71**
Minor Group:	**712**
Unit Group:	**7126**

Occupation Specific Employers Panel:

S.N.	Name	Designation	Organization
1.	Mr. Dhirendra Prasad Jaiswal	Proprietor	Suman Nirman Sewa, Mahagadhi Mai-5, Bara
2.	Mr. Ganesh Phuyal	Proprietor	Bhawana Suppliers, Itahari-4, Sunsari
3.	Mr. Suresh Mishra	Regional Sales Manager	Panchakanya Group (Lumbini,Karnali & Sudurpaschhim), Tilottama-15, Rupandehi
4.	Mr. Bikash Kumar Karna	Regional Sales Manager	Panchakanya Group (Province 1 & 2), Birgunj -21, Parsa
5.	Mr. Bijaya Raj Gyawali	Deputy Marketing Manager	Nepal Hilltop Industries Pvt. Ltd., Kathmandu -29, Gongabu
6.	Mr. Purushottam Adhikari	General Manager	Hilltake Industries, Kathamndu-16, Bagmati
7.	Mr. Pradeep Shukla	Plant Manager	Mangalam Group, Siddharthanagar-4, Bhairawa
8.	Mr. Chabi Raj Joshi	Proprietor	Joshi Hardware, Bhartpur-9, Basanta Chowk, Chitwan
9.	Mr. Sanjaya Poudel	Proprietor	Sanjaya and Sujan Enterprises, Bharatpur-15, Chitwan
10.	Mr. Arjun Sunar	Marketing Manager	Dilaram Enterprises, Kaireni-8, Parsa, Chitwan
11.	Mr. Rameshwor Itani	Proprietor	Syarase Kalika Sanitary Suppliers, Rapti -2 , Gadauli, Chitwan
12.	Mr. Ganesh Pathak	Proprietor	New Jay Ganesh Hardware, Rapti -2 , Gadauli, Chitwan

Occupation Specific Expert Workers Panel:

S.N.	Name	Designation	Organization
1.	Mr. Hiralal Chaudhary	Senior Plumbing Technician	Budhiganga Nirman Sewa, Dhangadi-4, Kailali
2.	Mr. Loknath Adhikari	Senior plumber	Jyoti Jwala Construction, Bharatpur-11, Chitwan
3.	Mr. Bhawani Pd. Chapagain	Technician/Plumber	Naba Nirman Sewa, Birendranagar-11, Surkhet
4.	Mr. Pramod Yadav	Junior Plumber	Suman Nirman Sewa, Mahagadimai-5, Bara
5.	Mr. Jayprakash Yadav	Plumber	Suman Nirman Sewa, Mahagadimai-5, Bara
6.	Mr. Surendra Darlami Magar	Plumber	Bhawana Suppliers, Itahari-3, Sunsari
7.	Mr. Bhojraj Chaudhary	Plumber & Electrician	Aatreya Electrical & Plumbing Works, Butwal-10, Rupandehi
8.	Mr. Bishnu Ghimire	Technician	Nepatop Pvt. Ltd., Devchuli-11, Nawalpur, Susta East
9.	Mr. Suman Chaudhary	Plumbing Technician	Hilltake Plastic and Pipe Industries (P) Ltd., Tikapur-1, Kailali
10.	Mr. Babu Raja Maharjan	Coordinator/Senior plumber	Hilltake Plastic and Pipe Industries (P) Ltd., Kathmandu-16 , Balaju
11.	Mr. Kamal Bahadur Darai	Plumber Technician	Hilltake Plastic and Pipe Industries (P) Ltd., Gaidakot-5, Nawalpur
12.	Mr. Rishi Ram Neupane	Plumber	Shree Mahalaxmi Enterprises, Bharatpur-16, Chitwan

OS Development Workshop facilitated by:

S.N.	Name	Designation	Organization
1.	Raju Bajracharya	Facilitator	Freelance
2.	Yubak Raj Ghimire	Co-facilitator/Recorder	Freelancer

OS Reviewed by ELMS Construction Sector Working Group:

S.N.	Name	Designation	Representation (Organization)
1.	Mr. Gore Sherpa	General Secretary	FNCCI (IPAAN)
2.	Mr. Saurav Sharma	Member	CNI
3.	Mr. Satya Narayan Prajapati	Treasurer	FNCSI
4.	Mr. Santosh Shah	Executive board member	FCAN
5.	Mr. Ramesh Man Shakya	Construction Sector Expert	ELMS

OS Verified by ELMS Technical Advisory Committee:

S.N.	Name	Designation	Organization
1.	Dr. Mahesh Nath Parajuli	Professor	KU
2.	Mr. Kul Bahadur Phadera	Under secretary	MoEST
3.	Mr. Pravat Uprety	Associate Professor	TU
4.	Mr. Kishor KC	Statistics Officer	CBS
5.	Ms. Sharada Ghimire	Deputy. Director	CTEVT, Curriculum Division
6.	Mr. Keshab Ghimire	Deputy Director	CTEVT, NSTB

OS Recommended by ELMS Coordination Committee:

S.N.	Name	Designation	Organization
1.	Mr. Rabin Kumar Shrestha	Focal Person/Ex EC Member	FNCCI
2.	Mr. Sumit Kumar Kedia	Executive Committee Member	FNCCI
3.	Mr. Birendra Raj Pandey	Vice President	CNI
4.	Ms. Megh Nath Neupane	Senior Consultant	CNI
5.	Ms. Shobha Gurung	Vice President	FNCSI
6.	Mr. Mohan Katuwal	Vice President	FNCSI
7.	Mr. Binayak Shah	Senior Vice President	HAN
8.	Mr. Sajan Shakya	Secretary General	HAN
9.	Mr. Nicholas Pandey	Senior Vice President	FCAN
10.	Mr. Roshan Dahal	General Secretary	FCAN

OS Approved by ELMS Board:

S.N.	Name	Designation	Organization
1.	Mr. Shekhar Golchha	President	FNCCI
2.	Mr. Vishnu Kumar Agarwal	President	CNI
3.	Mr. Shyam Prasad Giri	President	FNCSI
4.	Ms. Srijana Rana	President	HAN
5.	Mr. Rabi Singh	President	FCAN
6.	Mr. Chandra Kanta Adhikari	Member Secretary	ELMS

Occupational Description:

A Plumber is a tradesman specialized in installing, replacing and maintaining water and sewage systems, and hydraulic heating systems in residential, commercial and industrial buildings. Plumbers are employed by plumbing contractors, service companies, and construction companies or are self-employed for the community services. Plumbers install piping and equipment in residential, commercial, institutional and industrial buildings and sites. Plumbers use a variety of tools and equipment such as hand and power tools, welding/soldering/brazing equipment, and hoisting and lifting equipment to perform the tasks in their trade. Plumbers work with a variety of piping materials such as copper, steel, plastic, cast iron, cement, fiberglass and special composite materials.

Plumbers need good communication skills to communicate with co-workers and clients. Plumbers require to interpret building and plumbing drawing, knowledge about the pipes and measuring, cutting, joining different pipes and installing fittings and fixture skills. Joining pipe may be done by various means, such as threading, using mechanical joints, welding, soldering/brazing, heating and chemical compounds. Plumber's test and commission systems to ensure proper operation. They also perform scheduled, unscheduled and emergency maintenance and repair works. They inspect piping systems and diagnose system faults and/or malfunctions during repair and maintenance. Safety awareness is essential for every plumbers. Depending on the working condition, they may have to work indoors or outdoors or work at heights and in confined spaces.

Till the date, workers enter as a labor without prior skills and technical knowledge and after apprenticeship of few months or years they became a semi-skilled worker. Currently, residential and commercial building construction business in the country is widening and the investors of this sectors are facing shortage of skilled plumbers. So this occupation has high demand in urban and semi-urban areas of the country.

The occupation **Plumber Level-2 (Foreman Level)** describes the individual with required knowledge for applying basic method of performance, knowledge to select tools, equipment and materials appropriate for the given task. S/he possess the ability to apply basic theory and principle of the common duties and tasks to solve the given assignment. Further, the plumber has ability to act independently in simple core skills and can work under the close supervision of supervisor for some higher level of tasks to ensure the technicality as a co-worker. The plumber supervises assistant worker and labour in the team. Nepal's industrial & business sector expects Individual having set level of skills, knowledge and attitudes which reflect for the improvement of production/services and workers' productivity.

Occupational and environmental safety:

The health hazards in plumbing work expose, especially in the respirable form. Fine dust and waste produced while cutting and grinding on brick and concrete wall, metallic and nonmetallic pipes, adhesives, solvents and welding joints cause lungs with symptoms of scarring cough and shortness of breath. Its most critical effect is a neurotoxin.

Noise pollution created by use of power tools and dust composition can be protected by use of sound proof boards in workshops/workplaces and use of dust collector. Covering the workplace with plastics could be another possible solution for getting rid of dust. Therefore, personal protective equipment including face mask, earplug, hard hat, safety shoes, safety gloves, safety glasses, overall and high visibility safety vests must be used by every plumber when working on welding, brazing, soldering, cutting, drilling and grinding works.

Seal tape cover, metallic cut pieces, packaging materials (papers and plastics), used fittings and broken ceramic pieces are the main wastages produced in plumbing. Precise estimation, recycling of plastics, papers and wrapping materials, metallic cut pieces and used fittings and disposal of ceramics items, rubber items, thermoplast, solvents/cement, containers, and glass pieces in prescribed sites are some ways to minimise pollution caused by the plumbing and increase the environmental safety.

Minimum Job Entry Requirement:

As per the labor law the Nepalese citizen aged 18 years and above and competent as per this occupation standards are eligible to enter in this occupation. To cope the required knowledge and tasks performance standard of this occupation, SEE pass graduates or equivalent qualification are recommended to enter in the skills and knowledge impartation courses. Minimum 2 years' experience with plumber's level 1 can also join this level of occupation.

Worker's traits:

The desired workers traits for the plumbing work needs mentally and physically fit and strong, having good sense of humor, disciplined and positive attitudes, prompt responsive to the assignment, good team players, high level of passionate, courteous, and having complete knowledge and skills in plumbing and ability to figure out the requirement of clients. Plumbers need to be enjoyed in working with installing pipes, pipe fittings and fixtures, replacing and maintaining water and sewage system in industries, commercial and residential building and using plumbing hand tools, equipment and power tools. Further, skillful in estimating and costing, good time management, punctual in assignment, creative in fittings and fixtures selection and installation, emergency problem resolving of water leakage and blockages, positive to work in blue-collar environment are additional skills required for plumbers. Besides, individual having friendly behaviors, good interpersonal skills and exhibiting strong organizational loyalty and professional ethics are essential attributes needed to enter in this occupation.

Occupational carrier path:

- **Above the Position-** Senior plumber – level 3 (Supervisor Level)
- **Current Position-** Plumber – level 2 (Foreman Level)
- **Below the Position-** Junior/Assistant plumber – level 1 (Assistant Level)

Abbreviation used:

Task Level		Rating number and their meaning
Significance	:	1- Important; 2-Moderately important; 3-Highly important
Ease	:	1- Easy; 2-Moderately easy; 3- Very easy
Occurrence	:	1-Rarely occurred; 2-Moderately occurred; 3-Frequently occurred

N/A	:	Not Applicable
OS	:	Occupation Standard
FNCCI	:	Federation of Nepalese Chambers of Commerce & Industry
CNI	:	Confederation of Nepalese Industries
FNCSI	:	Federation of Nepali Cottage & Small Industries
FCAN	:	Federation of Contractors' Associations of Nepal
HAN	:	Hotel Association Nepal
ELMS	:	Employers Led Market Secretariat
SWG	:	Sector Working Group
TAC	:	Technical Advisory Committee
SOP	:	Standard Operating Procedure
KU	:	Kathmandu University
MoEST	:	Ministry of Education, Science & Technology
TU	:	Tribhuvan University
CBS	:	Central Bureau of Statics
CTEVT	:	Council of Technical Education and Vocational Training
NSTB	:	National Skill Testing Board
Div.	:	Division
PPE	:	Personal Protective Equipment
GI	:	Galvanized Iron
MS	:	Mild Steel
SS	:	Stainless Steel
CI	:	Cast Iron
PPR	:	Polypropylene Random
CPVC	:	Chlorinated polyvinyl chloride)
HDPE	:	High Density Polyethylene.
UPVC	:	Unplasticized Polyvinyl Chloride
PVC	:	Polyvinyl chloride
CP	:	Chrome Plated
WC	:	Water Closet
NRV	:	Non Return Valve
STP	:	Sewage Treatment Plant
RO	:	Reverse Osmosis

List of duties and tasks of Plumbing: level-2

Soft Skills Area			
SN	**Duty statements**	**Task No**	**Task statements**
1.	Demonstrate Positive Attitudes	1.	Manage time for occupational assignment
		2.	Exhibit empathy with customer and team members
		3.	Apply the work ethics of the plumber
		4.	Respond assignment
		5.	Give/ Receive feedback and feed forward
2.	Exhibit Interpersonal Skills	6.	Listen customers' demands, complaints and other information
		7.	Communicate with others about products and services
		8.	Coordinate with customers, team members and stakeholders
		9.	Perform net-working with customers, team and stakeholders
3.	Demonstrate Occupational Leadership	10.	Exhibit behavior of team player among the members
		11.	Make decision at different situation of the occupation
		12.	Solve problem encountered in the occupation
		13.	Take responsibility and accountability of the assignment
		14.	Develop work plan for plumber
Core Skills Area			**of**
SN	**Duty statements**	**Task No**	**Task statements**
4.	Prepare work plan	15.	Prepare plumbing sketch
		16.	Perform estimating and costing
		17.	Prepare list of materials
		18.	Verify materials
		19.	Store materials
		20.	Prepare work schedule
5.	Apply Safety protocol	21.	Apply personal safety (PPE)
		22.	Manage first aid kit
		23.	Barricade workplace
		24.	Apply power tool safety
6.	Manage daily materials	25.	Keep records
		26.	Perform reporting
		27.	Manage set of hand tools in tool box
7.	Perform pipe installation	28.	Perform marking
		29.	Perform wall grooving
		30.	Cut metallic pipe
		31.	Cut non-metallic pipe
		32.	Perform pipe thread cutting
			Metal pipe joint:
		33.	Join GI pipes
		34.	Join MS pipes
		35.	Join copper pipes
		36.	Join CI pipes
			Non-metallic pipe joint:
		37.	Join PPR pipes
		38.	Join CPVC pipes
		39.	Join HDPE pipes
		40.	Join UPVC pipes
		41.	Join PVC pipes
		42.	Joint multilayer composite pipes
		43.	Perform pipe laying
		44.	Install pipe line for irrigation and harvesting.
		45.	Lay pipe line in Soak pit, safety tank and sewage treat plant.

8.	Install sanitary accessories	46.	Install shower set
		47.	Install water closet set
		48.	Fit urinal set
		49.	Install wash basin/kitchen sink
		50.	Fit bidet
		51.	Fit bath tub
		52.	Install CP fittings
		53.	Fit hand dryer
		54.	Install water meter
		55.	Install water pump
		56.	Install overhead tank
9.	Install heating and cooling system	57.	Install solar water heater
		58.	Install heat pump system
		59.	Install geyser
		60.	Install air condition
		61.	Install room heating system
		62.	Install chiller
		63.	Install steamer
		64.	Install Sauna
10.	Install pipe and fitting for filtration system	65.	Install pipe and fittings for Reverse Osmosis (RO) system
		66.	Install pipe and fittings for pre-filter
		67.	Install pipe and fittings for bio-sand filter
		68.	Install pipe and fittings for Jacuzzi and swimming pool
11.	Perform testing	69.	Test pressure of water supply system
		70.	Test drainage system
		71.	Demonstrate application process of bathroom, kitchen fittings and fixtures.
12.	Perform basic maintenance	72.	Repair leaky tap
		73.	Repair leaky flexible connecting pipe
		74.	Replace extension nipple
		75.	Repair leaky water closet
		76.	Repair leaky pipe
		77.	Repair Back flow
		78.	Repair supply blockage problem
		79.	Fix the water lifting problem on pump

Task Competency Standard

Soft Skills Area:			
Task number:	**1**		
Task statement:	**Manage time for occupational assignment**		
Level of task:	Significance	Ease	Occurence
	3	2	3
Terminal performance standard	**Given Condition** • Regular duty hours and work plan **Task:** Manage time for occupational assignment **Time:** N/A **Standard/Criteria:** • The daily work is started and ended as per given work plan (exhibited punctuality), • The work activities are performed as per the given work plan, • The task is completed within the given time frame.		
Related technical knowledge	• Meaning and importance of time management, • Work priority and rescheduling as per the urgency, • Points to be considered while managing time during duty hours.		

Task number:	**2**		
Task statement:	**Exhibit empathy with customers and team members**		
Level of task:	Significance	Ease	Occurence
	2	2	1
Terminal performance standard	**Given Condition** • Any incident (Problems, awkward situation or unusual situation) of customer or team members **Task:** Exhibit empathy with customers and team members **Time:** N/A **Standard/Criteria:** • Feelings (body language, gesture, posture, facial expression) are expressed as per the given incident during the performance; • Acted accordingly as per the feelings.		
Related technical knowledge	• Meaning and importance empathy; • Different situations for empathy; • Points to be considered while exhibiting empathy.		

Task number:	**3**		
Task statement:	**Apply the work ethics of the plumber**		
Level of task:	Significance	Ease	Occurence
	3	2	3
Terminal performance standard	**Given Condition:** • Occupational ethics and Code of conduct of organization or Standard operating procedure (SOP) **Task:** Apply the work ethics of the plumber **Time:** N/A **Standard/Criteria:** • Organisational code of conduct and occupational ethics are followed; • Standard Operating Procedure (SOP) is followed; • The confidentiality of the information is maintained; • The performer is satisfied and motivated in the occupation.		
Related technical knowledge	• Meaning and importance work ethics; • Occupational work ethics; • Code of conducts of organization or SOP.		

Task number:	**4**		
Task statement:	**Respond assignment**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition:** • Any assignment or task order **Task:** Respond assignment **Time:** N/A **Standard/Criteria:** • The task is responded promptly; • The given assignment is noted; • The given assignment is completed within the agreed time.		
Related technical knowledge	• Types of work and urgency; • Importance of timely response; • Time requirement of given assignment; • Methods of dealing with stakeholders.		

Task number:	**5**		
Task statement:	**Give/Receive feedback and feed forward**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Any assignment or task order **Task:** Give/Receive feedback and feed forward **Time:** N/A **Standard/Criteria:** • The feedback is listened actively; • The feedback and feed forward given is noted; • Feedback is started with positive part of the performance; • Constructive feedback is given objectively and specific; • Digestible amount of feedback is given.		
Related technical knowledge	• Meaning and importance of feed forward and feedback; • Types of feedback; • Techniques of giving and receiving feed forward and feedback.		

Task number:	**6**		
Task statement:	**Listen customers' demand, complaints or others information**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Customer or team member is complaining / reporting/providing other information **Task:** Listen customers demand, complaints or others information **Time:** N/A **Standard/Criteria:** • Complaints/ demand and information is listened actively; • Response (nodding the head) is exhibited during active listening; • Questions are asked for clarification; • Complaints/demands and/or other information are clearly noted; • Reporter or complainant is satisfied with plumber's listening skills.		
Related technical knowledge	• Importance of active listening; • Differences between active listening and hearing; • Techniques of active listening.		

Task No:	7		
Task statement:	**Communicate with others about products and services**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Information about products and services to be communicated; • Audience or stakeholders **Task:** Communicate with others about products and services **Time:** N/A **Standard/Criteria:** • Voice is clear and audible; • Vocal is pleasant; • Visual expressions are natural; • Information communicated is concise and complete.		
Related technical knowledge	• Meaning and importance of effective communication; • Effective communication model; • Types of communication; • Means of communication; • Techniques of effective communication.		

Task number:	8		
Task statement:	**Coordinate with customers, team members and stakeholders**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Agenda or issue or information to be coordinated; • Team members or relevant stakeholders and • Means of coordination. **Task:** Coordinate with customers, team members and stakeholders **Time:** N/A **Standard/Criteria:** • The given agenda, issues or information is shared with respective customers, team members and stakeholders; • The customers, team members and stakeholders are identified as per given the target receivers; • Coordination is done based on the given means of coordination.		
Related technical knowledge	• Meaning and importance coordination; • Means of coordination; • Techniques of effective coordination.		

Task number:	9		
Task statement:	**Perform net-working with customers, team and stakeholders**		
Level of task:	Significance	Ease	Occurrence
	3	1	2
Terminal performance standard	**Given Condition:** • Assignment and Job description. **Task:** Perform net-working with customers, team and stakeholders **Time:** N/A **Standard/Criteria:** • List of customers and stakeholders are prepared; • Necessary communication and coordination are made with customers, team and stakeholders; • Service delivery met the standard of the organization; • Additional service procurement is easily available.		
Related technical knowledge	• Meaning and importance of networking; • Means of networking; • Techniques of effective networking.		

Task number:	10		
Task statement:	**Exhibit behavior of team player among the members**		
Level of task:	Significance	Ease	Occurrence
	2	1	2
Terminal performance standard	**Given Condition:** • Assignment and • Working team. **Task:** Exhibit behavior of team player among the members **Time:** N/A **Standard/Criteria:** • Team members are encouraged; • Ownership of the work is taken collectively; • Cooperative and assertiveness are possessed in the team; • Responsibilities and accountabilities are taken.		
Related technical knowledge	• Meaning and importance of team work; • Characteristics of good team player; • Phases of team formation; • Tips of effective team work.		

Task number:	11		
Task statement:	**Make decision at different situation of the occupation**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition:** • Any assignment with possible unusual situation during the process and Problem or case and time frame **Task:** Make decision at different situation of the occupation **Time:** N/A **Standard/Criteria:** • Decision is taken within given time frame; • Desired result is achieved; • Decision has considered efficient use of time, money and resources.		
Related technical knowledge	• Meaning and importance of decision making; • Simple decision making process.		

Task number:	12		
Task statement:	**Solve problem encountered in the occupation**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition:** • Any problem or case and time frame **Task:** Solve problem encountered in the occupation **Time:** N/A **Standard/Criteria:** • Problem is analyzed; • Possible solutions are identified; • Effective solution is selected; • Solution has considered efficient use of time, money and resources; • Problem is solved in given time frame; • Desired result is achieved.		
Related technical knowledge	• Meaning and importance of problem solving; • List of potential problems in the plumbing; • General problem solving techniques.		

Task number:	13		
Task statement:	**Take responsibility and accountability of the assignment**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition:** • Assignment; • Job description **Task:** Take responsibility and accountability of the assignment **Time:** N/A **Standard/Criteria:** • All team members exhibited dedication to the assignment; • Every member has taken their respective responsibilities and attempted to complete the assignment; • The assignment is completed in time; • The ownership of the results of the assignment are taken collectively.		
Related technical knowledge	• Meaning of responsibility and accountability; • Importance of responsibility and accountability for plumber.		

Task No:	14		
Task statement:	**Develop work plan of plumber**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition:** • List of tasks and their priority order; • Planning forms and format; • Job description. **Task:** Develop work plan of plumber **Time:** N/A **Standard/Criteria:** • Plan is developed as per given task; • Planning is done in given forms and formats; • Activities are listed sequentially in the given forms and format; • The start time and end time of every activity is mentioned. • The responsible person for the activity is mentioned in the plan; • The work plan has considered efficient use of resources (time, money, and people).		
Related technical knowledge	• Meaning of planning; • Importance of planning; • Different planning tools; • Points to be considered while planning.		

Core Skills Area			
Task number:	**15.**		
Task statement:	**Prepare plumbing sketch**		
Level of task:	Significance	Ease	Occurrence
	3	1	1
Terminal performance standard	**Given Condition** • Demand/desire of clients; • Location of site or assignment; • Engineering civil/plumbing drawing. **Task:** Prepare plumbing sketch. **Time:** 20 minutes /sketch. **Standard/Criteria:** • The sketch is as per the customer demand or desire; • The dimensions are clearly mentioned; • Apparatus, fixtures and fittings are denoted by standard sign and symbols; • Sketch is clear, neat and clean.		
Related technical knowledge	• Meaning and importance of plumbing drawing (schematic and Isometric drawing); • Standard size of fittings and fixtures; • Signs, symbols and colour code used in plumbing.		
Safety/precaution	• N/A.		
Tools, equipment and materials	• Drawing paper (A-4); • Pencil, eraser, cutter; • Protractor, ruler, compass, template.		

Task number:	**16.**		
Task statement:	**Perform estimating and costing**		
Level of task:	Significance	Ease	Occurrence
	3	3	2
Terminal performance standard	**Given Condition** • Sketch; • List of plumbing materials; • Price list of the pipe fittings and fixtures; • Labour rate; • Standard estimating forms and format. **Task:** Perform estimating and costing. **Time:** 60 minutes **Standard/Criteria:** • Quantity of plumbing materials are matched with quantity calculated from the given sketch (size, sign & symbol); • Cost of labour and materials are calculated based on given labour rate and price list of pipe fittings and fixtures; • Estimate is done in given standard format; • Cost estimate is matched with the cost estimate done by supervisor.		
Related technical knowledge	• Specification and quality of materials; • Mathematical calculation; • Quantity calculation of materials and labour; • Units of the materials/works; • Cost estimate of plumbing works.		
Safety/precaution	• Make sure the mathematical calculation are correct; • Make sure all items and activities are included in the estimate.		
Tools, equipment and materials	• Standard format, sketch and calculator.		

Task number:	17.		
Task statement:	**Prepare demand list of materials**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Sketch; • Estimate; • Standard and specifications. **Task:** Prepare demand list of materials. **Time:** 30 minutes /list **Standard/Criteria:** • All required materials(pipes, fittings and fixtures) for given plumbing works are included in the list; • Quantities of materials are matched with given sketch and estimate; • Quality of materials are matched with the given standard and specifications.		
Related technical knowledge	• Definition of pipes, fittings and fixtures, their types and sizes; • Functions, specifications and qualities of pipes, fittings and fixtures;		
Safety/precaution	• N/A		
Tools, equipment and materials	• Standard format; • Standards; • Specifications; • Calculator.		

Task number:	18.		
Task statement:	**Verify materials**		
Level of task:	Significance	Ease	Occurrence
	3	3	2
Terminal performance standard	**Given Condition** • Estimated/demand list of materials; • Procured materials and their quantity; • Standard/specification or references of the materials. **Task:** Verify materials. **Time:** 3 minutes /materials (depends on the quantity and specification of materials) **Standard/Criteria:** • Received quantity of materials are matched with the given estimated/demand list of material; • Material qualities are matched with the given standard and specifications or qualities mentioned in the given estimate.		
Related technical knowledge	• Meaning and importance of materials verification in construction; • Plumbing materials (pipes, fittings and fixtures), types and sizes; • Quality and specification of plumbing materials; • Mathematical calculation / measurement of plumbing materials.		
Safety/precaution	• Handle ceramic and glass materials carefully during verification process.		
Tools, equipment and materials	• Estimate or demand list of materials; • Calculator; • Standards or specifications.		

Task number:	19.		
Task statement:	**Store materials**		
Level of task:	Significance	Ease	Occurrence
	3	3	2
Terminal performance standard	**Given Condition** • Store room/place in the site; • Verified materials; • Returned material from site; • Standard storage references, key and pad lock. **Task:** Store materials. **Time:** 4 hours /procurement event. **Standard/Criteria:** • Verified and returned materials are stored in given store/ place (with easy access); • Materials are stored as per their category; • Materials are stored as per instruction given by the manufacturer; • Store is locked with given key and pad lock.		
Related technical knowledge	• Meaning and importance of storing plumbing materials; • Segregation of materials, category or types of plumbing materials; • Procedure of storing plumbing materials.		
Safety/precaution	• Store materials categorically; • Handle ceramic and glass materials carefully.		
Tools, equipment and materials	• Store rack; • Key and padlock.		

Task number:	20.		
Task statement:	**Prepare work schedule**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • List of activities; • Drawing; • Start date, duration of activities and format of schedule; • List of team members. **Task:** Prepare work schedule. **Time:** 60 Minutes /schedule. **Standard/Criteria:** • Work schedule is prepared in a given format; • All plumbing activities are listed out in sequential order; • Different colours are used for different activities; • Start date, end date is mentioned for every activity; • Team member are assigned for each activity.		
Related technical knowledge	• Meaning and importance of work schedule; • Activities in the plumbing and its sequencing order; • Duration required for completing every activity. • Human resource required for every activity.		
Safety/precaution	• Consider work sequences; • Make sure all activities are considered in sequential order.		
Tools, equipment and materials	• Standard formats; • Stationery.		

Task number:	21.		
Task statement:	**Apply personal safety (PPE)**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • PPE (helmet, gloves, safety shoes, goggles, apron, mask, safety harness, ear plug, HV jacket); • Job assignment; • Organisational safety manual or guideline. **Task:** Apply personal safety (PPE). **Time:** 15 minutes /daily routine work. **Standard/Criteria:** • PPE materials are selected based on the activities needed to be accomplished; • PPE are used as per assigned work or given job assignment, during working hours; • Workplace is cleaned every day after completion of work; • PPE is placed at accessible place after application.		
Related technical knowledge	• Importance of PPE and their uses; • Conduction of safety meeting; • Meaning of occupational safety; • Common safety measures; • Organisational safety guidelines.		
Safety/precaution	• Apply PPE; • Handle materials safely and store them at accessible place.		
Tools, equipment and materials	• Occupational safety and health guideline.		

Task number:	22.		
Task statement:	**Manage first aid kit**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • List of materials required for the first aid kit. **Task:** Manage first aid kit. **Time:** 2 hours /first aid kit box. **Standard/Criteria:** • The content of the first aid kit is matched with the given list or standard of first aid kit. • The validity or expiry date of emergency medicines are checked. • First aid kit content is updated and placed at visible to all; • First aid kit is placed at easily accessible to all • Emergency numbers are pasted at the front side of the first aid kit.		
Related technical knowledge	• Meaning of first aid and its Importance; • Medication and its importance; • First aid kit and its contents or common list. • Common accident and injury cases in the work place.		
Safety/precaution	• Regular updating of first aid kit is prime; • Keep first aid kit in dry, accessible and visible to all pace.		
Tools, equipment and materials	• First aid kit containing: handyplast, cotton, gloves, sanitizer, bandage, para cetamol, betadine, sprit etc.		

Task number:	23.		
Task statement:	**Barricade workplace**		
Level of task:	Significance	Ease	Occurrence
	3	3	2
Terminal performance standard	**Given Condition** • Working site and types of work. **Task:** Barricade workplace. **Time:** 30 minutes /site of routine work **Standard/Criteria:** • The workplace with possibility of accident is barricaded with warning tape; • Warning sign, symbol and notice boards are kept in place visible to all; • Safety net and safety bar are applied for barricading work place.		
Related technical knowledge	• Meaning of barricading, barricading types and materials ; • Points to be consider while barricading the working site; • Procedure of barricading; • Barricading standard or references.		
Safety/precaution	• Determine safety space in the site; • Handle barricade materials safely.		
Tools, equipment and materials	• Hammer • Warning tape; • warning board; • Safety net; • Safety bar. • Plier; • Wrench; • Nylon rope; • Barricade materials.		

Task number:	24.		
Task statement:	**Apply power tool safety**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Power tools; • Manual and guidelines. **Task:** Apply power tool safety. **Time:** N/A (safety measures should be applied during the whole procedure) **Standard/Criteria:** • Safety covers of power tools are regularly maintained; • Sharp and new cutting wheels are fitted in power tools; • Power supply chord is insulated and free from damage; • Given manual and guidelines are followed for operation and maintenance; • Power tools are used gently.		
Related technical knowledge	• Meaning and importance of power tool safety; • Familiarize with power toll manual and guidelines; • Explain functions and uses of power tools.		
Safety/precaution	• Apply PPE; • Use only genuine and recommended spare parts; • Make sure the power tools are functional; • Handle the power tools safely.		
Tools, equipment and materials	• Angle grinder, hand drill machine; • Breaker; • Heating machine; • Core cutter.		

Task number:	**25.**		
Task statement:	**Keep records**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Day book; • Verified material list; • Requisition form; • List of returned materials. **Task:** Keep records of materials. **Time:** 30 minutes /daily routine work. **Standard/Criteria:** • All materials are received or supplied based on the given requisition form; • All issued and returned materials are entered sequentially in day book; • Day book is filled up daily with ink pen; • Record is free from any corrections; • Daily quantity is verified and the day book is closed; • Day book is signed by authorized person.		
Related technical knowledge	• Day book definition, entry process; • Verification process of record; • Types of requisition forms.		
Safety/precaution	• Make sure there is no space left between the words and lines during entry of the day book; • Ensure there is no re-writing and corrections are made.		
Tools, equipment and materials	• Day book; • Requisition form.		

Task number:	**26.**		
Task statement:	**Perform reporting.**		
Level of task:	Significance	Ease	Occurrence
	2	2	1
Terminal performance standard	**Given Condition** • List of daily consumed materials; • Data from day book; • Standard reporting format. **Task:** Perform reporting. **Time:** 15 minutes for daily reporting. **Standard/Criteria:** • Daily consumed materials are matched with the day book recording; • Daily carried out activities are matched with the planned activities; • All daily activities and consumed materials are reported in given standard reporting format;		
Related technical knowledge	• Importance of reporting and types of reporting format.		
Safety/precaution	• Make sure the deviation in activities and consumed materials are indicated in remarks.		
Tools, equipment and materials	• Standard reporting format and • Stationaries.		

Task number:	27.		
Task statement:	**Manage set of hand tools in tool box**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Tool box; • Hand tools. **Task:** Manage set of hand tools in tool box. **Time:** 15 Minutes /setting. **Standard/Criteria:** • The tool box contains all hand tools: measuring, marking, levelling, cutting and shearing, tightening and loosening tools. • All hand tools are functional and free from damage; • All hand tools are kept separately in order for ease access.		
Related technical knowledge	• Meaning and importance of hand tools and tool box; • Application procedure of hand tools; • Safety measure of hand tools and its application.		
Safety/precaution	• Make sure all hand tools are kept in order in tool box.		
Tools, equipment and materials	• Measuring tape; • Sprit level; • Wrench (slide/pipe), screw driver; • Plier, hacksaw frame; • Chisel, file (half round, flat & full round); • Hammer, chalk, ruler, pipe cuter, • Plumbob, vice grip, die set; • Allen key, line tester, • Silicon gun.		

Task number:	28.		
Task statement:	**Perform marking**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Plumbing lay out sketch/drawing; • Location or site. **Task:** Perform marking. **Time:** 15 minutes /marking or /task. **Standard/Criteria:** • Marking is matched with the dimensions given in the plumbing lay out sketch/drawing; • Markings are done as per standard signs, symbols and colour coding.		
Related technical knowledge	• Meaning and importance of marking in plumbing site; • Interpret plumbing lay out sketch/ drawing; • Measurement, symbol and marking method.		
Safety/precaution	• Marking needs to be clear, neat and clean without any correction; • The marked area needs to be prevented from getting wet or moisture.		
Tools, equipment and materials	• Measuring tape, ruler, chalk, spirit level; • Bevel protractor, right angle, plumbob.		

Task number:	29.		
Task statement:	**Perform wall grooving**		
Level of task:	Significance	Ease	Occurrence
	2	3	3
Terminal performance standard	**Given Condition** • Plumbing layout sketch; • Pipe size; • Marked location (on wall). **Task:** Perform wall grooving. **Time:** 3 hours /set of task. **Standard/Criteria:** • Grooving is done at the marked place (on wall); • The depth of grooving is straight and matched with the given size of the pipe; • Grooving is made horizontal/vertical/or in an angle and matched with the given plumbing layout sketch/drawing; • Grooving is plumb/ levelled with the wall.		
Related technical knowledge	• Meaning and importance of cold chisels, their types and uses; • Explain angle grinder and types of grinding discs; • Procedure of grooving manually with cold chisel, bolster and hammer; • Procedure of grooving with angle grinder.		
Safety/precaution	• Apply PPE (safety gloves, safety shoes, safety goggles, face mask, safety helmet and working apron).		
Tools, equipment and materials	• Cold concrete chisel; • Bolster chisel; • Sledge hammer; • Angle grinder; • Diamond cutting disc; • Dust collector.		

Task number:	30.		
Task statement:	**Cut metallic pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Plumbing sketch/drawing; • Metal pipes; • Metal pipe cutters; • Vice; • Coolant (water/oil). **Task:** Cut metallic pipe. **Time:** 5 minutes /cutting. **Standard/Criteria:** • Metallic pipes are cut as per given size, dimension and measurements in given plumbing sketch/ drawing; • Pipes are cut fully in straight/angle as per given plumbing drawing; • Chips are removed; • Working place is cleaned after completion of work.		
Related technical knowledge	• Meaning and importance of metallic pipe and its types; • List cutting machine/tools, their use, application and cutting wheel; • Methods of clamping.		
Safety/precaution	• Make sure the pipes are never half cut and broken; • Apply PPE.		
Tools, equipment and materials	• Pipe vice, angle grinder; • Cut off machine, hacksaw; • Wheel cutter.		

Task number:	31.		
Task statement:	**Cut non-metallic pipe**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Plumbing sketch/drawing or cutting size. • Types of pipe cutter; • Non-metallic pipe. **Task:** Cut non-metallic pipe. **Time:** 10 minutes /cutting. **Standard/Criteria:** • Pipes are cut as per given size, dimension and measurements in given plumbing sketch/ drawing; • Pipes are cut straight; • Cut is smooth or camferring is done.		
Related technical knowledge	• Define non-metallic pipes, its types and sizes; • Explain cutting procedure.		
Safety/precaution	• Prevent pipe joints from moisture and dirt.		
Tools, equipment and materials	• Pipe cutter; • Tool box.		

Task number:	32.		
Task statement:	**Perform pipe thread cutting**		
Level of task:	Significance	Ease	Occurrence
	2	2	1
Terminal performance standard	**Given Condition** • Plumbing layout sketch; • Types of pipe (GI or MS or SS) **Task:** Perform pipe thread cutting. **Time:** 10 Minutes /end of cut piece of pipe. **Standard/Criteria:** • Thread cut length is matched with the diameter and standard of pipes; • Threads are cut straight and horizontal; • Threads are matched with the respective pipe fittings (free from loose, bend and slip); • Chips are removed.		
Related technical knowledge	• Meaning and importance of pipe thread and thread cutting; • Thread length standard; • Thread cutting dies, handle and types; • Thread cutting procedure.		
Safety/precaution	• Apply PPE; • Make sure the thread cutting die teeth is cleaned.		
Tools, equipment and materials	• Pipe vice; • Die set with handle; • Coolant oil; • Cleaning brush; • Fittings; • Pipes.		

Task number:	33.		
Task statement:	**Join GI pipes**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Plumbing layout sketch; • Piece of GI pipes after threadening; • Quantity or number of pipes to be joined. **Task:** Join GI pipes. **Time:** 10 minutes /joint. **Standard/Criteria:** • GI thread cut length is matched with the diameter and standard of pipes; • GI pipes are joined with respective pipe fittings; • Sealing is done as per given specification; • Sealing materials are not visible; • GI pipe joints are free from leakage after testing.		
Related technical knowledge	• Definition of GI pipes and its sizes; • Explain Joining procedure of GI pipes; • List GI pipe fittings; (socket, reducer, elbow, tee, unions, plugs, cross, nipples, bushes, caps and flanges). • Procedure of GI pipe clamping; • Explain sealing materials.		
Safety/precaution	• Apply PPE and joints needs to be leakage free.		
Tools, equipment and materials	• Pipe vice, vice grip, pipe wrench, teflon tape; • Hemp, pipe vice, lead/soldering, checking socket; • GI Fittings (socket, reducer, elbow, tee, unions, plugs, cross, nipples, bushes, caps and flanges).		

Task number:	34.		
Task statement:	**Join MS pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipe used; • Piece of pipes after threading. **Task:** Join MS pipe. **Time:** 15 minutes /joint. **Standard/Criteria:** • MS thread length is matched with the diameter and standard of pipes; • MS pipe are joined with respective fittings; • Sealing is done as per given specification; • Sealing materials are not visible; • MS pipe joints are free from leakage after testing.		
Related technical knowledge	• Meaning and importance of MS Pipe and its type; • Joining procedure of MS pipes; • List of MS pipe fittings; • Clamping procedure of different types of MS pipes; • Welding procedure of MS pipe.		
Safety/precaution	• Apply PPE; • Use fire proof gloves, boots and apron; • Use fire extinguisher and fire blanket.		
Tools, equipment and materials	• Pipe vice, chain vice, vice grip; • Pipe wrench, teflon tape, copper sheet; • Fittings (socket, reducer, elbow, Tee, unions, plugs, cross, nipples, bushes, caps and flanges).		

Task number:	35.		
Task statement:	**Join copper pipes**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipes; • Piece of pipes after threading. **Task:** Join copper pipes **Time:** 15 minutes /joint. **Standard/Criteria:** • Copper pipes are joined with respective pipe fittings; • Sealing is done as per given specification; • Sealing materials are not visible; • Soldering is done all around the pipe; • Sealing is done by O-ring; • Copper pipe joints are free from leakage after testing.		
Related technical knowledge	• Meaning and importance of copper pipes and its fittings; • Clamping procedure of copper pipes; • Joining procedure of copper pipes; • Soldering procedure of copper.		
Safety/precaution	• Apply PPE, use fire proof gloves, boots and apron; • Use fire extinguisher and fire blanket.		
Tools, equipment and materials	• Pipe vice, vice grip, pipe wrench; • Teflon tape, copper sheet, Fittings (socket, reducer, elbow, Tee, unions, plugs, cross, nipples, bushes, caps and flanges) and lead/soldering.		

Task number:	36.		
Task statement:	**Join CI pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipes; **Task:** Joint CI pipe. **Time:** 30 minutes /joint. **Standard/Criteria:** • CI pipes are joined with respective fittings; • Lead is filled uniformly around the joint; • Lead is compacted using different caulking tool; • CI pipe joints are free from leakage after testing.		
Related technical knowledge	• Meaning and importance of CI pipes and its fittings; • Clamping procedure of CI pipes; • Joining procedure of CI pipes; • Lead melting and filling in CI joints; • Safety measure of handling of caulking tool.		
Safety/precaution	• Apply PPE; • Use fire proof gloves, boots and apron; • Use fire extinguisher and fire blanket.		
Tools, equipment and materials	• Chain vice, lead (Pb), stove: • Lead melting cast iron pot, sledge hammer, ladle; • Lead packing chisel tools (caulking/yarning iron); • Fittings (socket, reducer, elbow, tee, caps and flanges). • Lead/soldering.		

Task number:	**37.**		
Task statement:	**Join PPR pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipes or • Cutting piece of PPR pipes; • Quantity of pipes needed to be joined. **Task:** Join PPR pipe. **Time:** 10 minutes /joint. **Standard/Criteria:** • PPR pipe are joined with respective fittings; • PPR heating head is selected based on pipe diameter; • End joint of the pipe is aligned and heated to the recommended time; • PPR pipe joints are free from leakage when tested;		
Related technical knowledge	• Definition of PPR pipe and its fittings; • Explain PPR Joining and welding procedure.		
Safety/precaution	• Apply PPE; • Prevent joint from moisture/water and dirt.		
Tools, equipment and materials	• PPR welding machine; • Composite crimping tools; • Chamfering tool; • Heating machine; • Fittings.		

Task number:	**38.**		
Task statement:	**Join CPVC pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipes or cutting piece of CPVC pipes; **Task:** Join CPVC pipe. **Time:** 30 minutes /joint. **Standard/Criteria:** • CPVC pipes are joined with respective fittings; • Adhesive solution is applied as per given specification; • Adhesive solution is dry and hold strongly; • CPVC pipe joints are free from leakage when tested.		
Related technical knowledge	• Meaning and importance of CPVC pipes, its types and fittings; • CPVC pipe joining procedure; • Adhesive solution and its application technique.		
Safety/precaution	• Apply PPE; • Prevent joint from moisture/water and dirt.		
Tools, equipment and materials	• Composite crimping tools; • Chamfering tool; • Adhesive solution; • CPVC fittings.		

Task number:	39.		
Task statement:	Join HDPE pipe		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipe or cutting piece of HDPE pipes; **Task:** Join HDPE pipe **Time:** 10 minutes /joint. **Standard/Criteria:** • HDPE pipes are joined with respective fittings; • Sealing is done as per given specification; • Sealing materials are invisible; • HDPE pipe joints are free from leakage when tested.		
Related technical knowledge	• Meaning and importance of HDPE pipe and its sizes; • Joining procedure of HDPE pipe; • Describe HDPE pipe fittings; • HDPE pipe welding and its types; • Manual welding in hot plate and similar tools; • Teflon sheet and its use in HDPE welding.		
Safety/precaution	• Apply PPE; • Prevent joint from moisture/water and dirt; • Use HDPE welding and hot plates safely.		
Tools, equipment and materials	• Hot plate; • HDPE welding machine; • Teflon sheet; • HDPE pipe facing machine; • Composite crimping tools; • Chamfering tool; • Fittings.		

Task number:	**40.**		
Task statement:	**Join UPVC pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipes or cutting piece of UPVC pipe; **Task:** Join UPVC pipe. **Time:** 30 minutes /joint. **Standard/Criteria:** • UPVC pipes are joined with respective fittings; • Solvent cement is applied as per given specification; • Solvent cement is dry and hold strongly; • UPVC pipe joints are free from leakage when tested.		
Related technical knowledge	• Define UPVC pipe, fittings and its sizes; • Explain UPVC pipe Joining procedure; • Solvent cement and its application techniques.		
Safety/precaution	• Apply PPE; • Handle solvent cement carefully.		
Tools, equipment and materials	• Composite crimping tools; • Chamfering tool; • Solvent cement; • UPVC fittings.		

Task number:	41.		
Task statement:	**Join PVC pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipe or cutting piece of PVC pipes. **Task:** Join PVC pipe. **Time:** 30 Minutes /joint. **Standard/Criteria:** • PVC pipes are joined with respective fittings; • Solvent cement is applied as per given specification; • Solvent cement is dry and hold strongly; • O-ring is fitted tightly and pushed; • PVC pipe joints are free from leakage when tested.		
Related technical knowledge	• Define PVC pipe and its fittings; • Joining procedure of PVC pipes; • O-ring joint (push fit).		
Safety/precaution	• Apply PPE; • Handle solvent cement carefully.		
Tools, equipment and materials	• Composite crimping tools; • Chamfering tool, • Solvent cement • PVC fittings • O-ring.		

Task number:	42.		
Task statement:	**Join multi-layer composite pipe**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Types of pipes or cutting piece of composite pipes; • And quantity or number of joints. **Task:** Join multi-layer composite pipe **Time:** 5 minutes /joint. **Standard/Criteria:** • Composite pipes are joined with respective fittings; • Solvent cement is applied as per given specification; • Solvent cement is dry and hold strongly • Crimping is done at the given mark and tightly fit; • Composite pipe joints are free from leakage when tested.		
Related technical knowledge	• Meaning and importance of multi-layer composite pipe and its fittings; • Composite pipe joining procedure.		
Safety/precaution	• Apply PPE; • Prevent joint from moisture/water and dirt.		
Tools, equipment and materials	• Composite crimping tools; • Solvent cement; • Multi-layer; • Chamfering tool.		

Task number:	43.		
Task statement:	**Perform pipe laying**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Layout sketch; • Location; • Types of pipe fixtures (brackets, C-clamps, clamps, U-clamps). **Task:** Perform pipe laying. **Time:** 4 hours /laying assignment. **Standard/Criteria:** • Pipes are laid in the given location matching the given layout sketch; • Pipes are laid with respective numbers of fixtures (clamps, brackets etc.); • Distances between the pipe clamps are maintained 1m; • Pipes are laid with alignment plumb, levelled and maintained gradient; • Pipes are in capped after laying out of pipes. • Patching (plastering and covering; sealing, packing) is done for sealing – standard.		
Related technical knowledge	• Meaning and importance of pipe fixtures and its types; • Pipe laying procedure.		
Safety/precaution	• Make sure pipes are unbroken when fixing or hammering clamps.		
Tools, equipment and materials	• Tool box; • Drill machine; • Drill bits; • Pipe clamps; • Plastic grips; • Screws; • Trowel; • Shovel; • Pick; • Cement and sand.		

Task number:	44.		
Task statement:	**Install pipe line for irrigation and harvesting**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Storage tank/ recharge pit; • Pump; • Pipe fittings. **Task:** Install pipe line for irrigation and harvesting. **Time:** N/A **Standard/Criteria:** • Outlet of pipe line is connected to the storage tank; • Over flow water is discharged to recharge pit.		
Related technical knowledge	• Define storage tank, its capacity and benefits; • Importance of recharge pit, size, material and connection.		
Safety/precaution	• Apply PPE; • Handle power tools carefully.		
Tools, equipment and materials	• Tool Box; • Hot plate; • HDPE welding machine • Teflon sheet • HDPE pipe facing machine; • Composite Crimping tools; • Power tool.		

Task number:	45.		
Task statement:	**Lay pipe line in soak pit, safety tank and sewage treatment plant**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Soak pit, safety tank, sewage treatment plant ready for pipe laying; • Drawing; • Pipes, fittings. **Task:** Lay pipe line in soak pit, safety tank and sewage treatment plant. **Time:** N/A **Standard/Criteria:** • Inlet pipe, outlet pipe and ventilating pipe is laid out on soak pit, safety tank and sewage treatment plant matching the given drawing. • The height, distance and projection of pipe is maintained as per given drawing. • Pipe joints are leak proof when tested.		
Related technical knowledge	• Meaning, importance and types of safety tank, soak pit and STP; • List pipes and pipe fittings; • Explain pipe laying in safety tank, soak pit and sewerage treatment plant.		
Safety/precaution	• Handle pipes and pipe fittings carefully; • Apply PPE.		
Tools, equipment and materials	• Tool Box with hand tools; • Hot plate; • HDPE welding machine; • Teflon sheet; • HDPE pipe facing machine; • Composite crimping tools; • Power tools.		

Task number:	46.		
Task statement:	**Install shower set**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Location with fixed plumbing pipes for fixing shower set; • Sketch/standard dimension. **Task:** Install shower set. **Time:** 3 hours /setting. **Standard/Criteria:** • Shower set is installed without damage; • Shower set is installed as per given sketch and standard dimension; • Shower set is levelled; • Shower set is passed in pressure test; • Silicon is used in between the ceramic to ceramic joining points; • Taps are fitted perpendicular to the wall; • Shower set is covered till to its operation; • Hot water and chilled water pipes are insulated.		
Related technical knowledge	• Meaning and importance of shower set, its context, and standard size; • Explain specification of shower set; • Procedure for levelling the shower set.		
Safety/precaution	• Consider visual weight /symmetry of alignment. • Handle shower set carefully; • Apply PPE.		
Tools, equipment and materials	• Tool box with hand tools; • Power tools, shower mixture, shower head, shower tap and fittings.		

Task number:	47.		
Task statement:	**Install water closet set**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Water closet; • Location with fixed plumbing pipes for fixing water closet; • Sketch/standard dimension. **Task:** Install water closet set. **Time:** 4 hours /setting. **Standard/Criteria:** • Water closet set are installed without damage; • Water closet set is installed as per given sketch and standard dimension; • Water closet set is levelled; • Water closet set and siphon are sealed tight; • Silicon is used in between the ceramic to ceramic joining points; • Water closet taps is fitted perpendicular to the wall; • Water closet is covered till to its operation.		
Related technical knowledge	• Definition of water closet set, its context, and standard size; • specification of water closet set; • The levelling and fixing procedure of water closet.		
Safety/precaution	• Handle the water closet set carefully; • Apply PPE.		
Tools, equipment and materials	• Tool box; • Power tools; • Bib cock; • Water closet; • Connecting pipe; • Angle valve; • Health faucet.		

Task number:	48.		
Task statement:	**Fit urinal set**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Urinal set; • Location with fixed plumbing pipes for fitting urinal set; • Sketch/standard dimension. **Task:** Fit urinal set. **Time:** 2 hours /setting **Standard/Criteria:** • Urinal set is installed without damage; • Urinal set is installed as per given sketch and standard dimension; • Urinal set is levelled; • Urinal set are passed in pressure test; • Silicon is used in between the ceramic to ceramic joining points; • Urinal set is fitted perpendicular to the wall; • Urinal set is covered till to its operation.		
Related technical knowledge	• Define Urinal set, its context, and standard size; • Specification of urinal; • Levelling and fixing procedure of urinal set.		
Safety/precaution	• Handle urinal set carefully; • Apply PPE.		
Tools, equipment and materials	• Tool box, power tools, urinal set; • Push valve, waste connecting pipe and sprayer.		

Task number:	49.		
Task statement:	**Install wash basin/kitchen sink set**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Kitchen-sink/ wash basin; • Location with fixed plumbing pipes for wash basin and kitchen sink; • Sketch/standard dimension. **Task:** Install wash basin/kitchen sink set. **Time:** 1 hours /setting. **Standard/Criteria:** • Kitchen sink and wash basin are installed without damage; • Kitchen sink and wash basin are installed as per given sketch and standard dimension; • Kitchen sink and wash basin are levelled; • Supply pipe is checked and passed in pressure test; • Silicon is used in between the ceramic to ceramic joining points; • Taps are fitted perpendicular to the wall; • Kitchen sink and wash basin are covered till to its operation; • Hot water and chilled water pipes are insulated.		
Related technical knowledge	• Meaning and importance of kitchen sink and wash basin, its context, and standard size; • Specification of wash basin and kitchen sink; • Levelling and fixing procedure of wash basin and kitchen sink.		
Safety/precaution	• Handle the kitchen sink and wash basin carefully; • Apply PPE.		
Tools, equipment and materials	• Tool box, power tools; • Wash basin set (basin mixture, wash basin, waste connector, angle valve, connecting pipe); • Sink set (sink mixture, waste connecting, angle valve, connecting pipe).		

Task number:	50.		
Task statement:	**Fit bidet set**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Bidet; • Location with fixed plumbing pipes for fitting bidet; • Sketch/standard dimension. **Task:** Fit bidet. **Time:** 2 hours /setting. **Standard/Criteria:** • Bidet is installed without damage; • Bidet is installed as per given sketch and standard dimension; • Bidet is levelled; • Bidet set is passed in pressure test; • Silicon is used in between the ceramic to ceramic joining points; • Taps are fitted perpendicular to the wall; • Bidet is covered till to its operation; • Hot water and chilled water pipe are insulated.		
Related technical knowledge	• Definition of bidet, its context and standard size; • Specification of bidet set; • List levelling and fixing procedure of bidet set.		
Safety/precaution	• Apply PPE and handle bidet set carefully;		
Tools, equipment and materials	• Tool box, power tools, bidet mixture; • Angle valve, connecting pipe and bidet waste connecting pipe.		

Task number:	51.		
Task statement:	**Fit bath tub**		
Level of task:	Significance	Ease	Occurrence
	3	2	3
Terminal performance standard	**Given Condition** • Bath tub; • Location with fixed plumbing pipes for fitting bath tub; • Sketch/standard dimension. **Task:** Fit bath tub. **Time:** 8 hours /setting. **Standard/Criteria:** • Bath tub is installed without damage; • Bath tub is installed as per given sketch and standard dimension; • Bath tub is levelled; • Bath tub set is passed in pressure test; • Silicon is used in between the ceramic to ceramic joining points; • Tap is fitted perpendicular to the wall; • Bath tub set is covered till to its operation; • Hot water and chilled water pipes are insulated.		
Related technical knowledge	• Meaning and importance of bath tub, its context, and standard size; • Specification of bath tub; • Levelling and fixing procedure of bath tub.		
Safety/precaution	• Handle the bath tub carefully; • Apply PPE.		
Tools, equipment and materials	• Tool box, power tools, bath tub; • Bath mixture and waste connector.		

Task number:	52.		
Task statement:	**Install CP fittings**		
Level of task:	Significance	Ease	Occurrence
	2	3	2
Terminal performance standard	**Given Condition** • C.P fitting fixture (chrome plated bath fittings); • Location and wall marked for CP fittings and fixtures; • Sketch/standard dimension. **Task:** Install CP fitting. **Time:** 3 hours /fitting. **Standard/Criteria:** • CP fitting is installed without damage; • CP fitting is installed as per given sketch and standard dimension; • CP fittings are levelled; • CP fitting is covered till to its operation;		
Related technical knowledge	• Meaning and importance of CP fittings, its context, and standard size; (towel rod towel ring, rack, soap case, paper holder, rob hook, tumbler, folder, dryer); • Specification of different CP fittings; • Levelling and fixing procedure of CP fittings; • Standard height for fixing CP fittings.		
Safety/precaution	• Handle the CP fittings carefully; • Apply PPE.		
Tools, equipment and materials	• Tool box; • Hand drill machine; • Drill bits; • Plastic grips and screws; • C.P fittings. (towel rod towel ring, rack, soap case, paper holder, rob hook, tumbler, folder, dryer).		

Task number:	53.		
Task statement:	**Fit hand dryer**		
Level of task:	Significance	Ease	Occurrence
	2	3	2
Terminal performance standard	**Given Condition** • Hand dryer; • Location with wall marked for fixing dryer; • Sketch/standard dimension. **Task:** Fit hand dryer. **Time:** 3 hours /fitting. **Standard/Criteria:** • Hand dryer is installed without damage; • Hand dryer is installed as per given sketch and standard dimension; • Hand dryer is levelled; • Hand dryer is covered till to its operation.		
Related technical knowledge	• Meaning of hand dryer, its context, and standard size; • Specification of hand dryer; • Levelling and fixing procedure of hand dryer; • Describe fixing height of fixtures.		
Safety/precaution	• Handle the hand dryer carefully; • Apply PPE.		
Tools, equipment and materials	• Tool box; • Power tools: • Hand dryer.		

Task number:	54.		
Task statement:	**Install water meter**		
Level of task:	Significance	Ease	Occurrence
	3	3	1
Terminal performance standard	**Given Condition** • Location with pipe line. **Task:** Install water meter. **Time:** 30 minutes /installation. **Standard/Criteria:** • Water meter is connected with main supply inside the compound wall; • Metre is connected at minimum 150 mm height from the ground; • One control valve is installed before joining the meter; • Meter is connected following the given instruction/arrow.		
Related technical knowledge	• Definition and importance of water meter, and flow unit; • Definition of valves, its types and their uses; • Plumbing fittings and their uses; • Installation procedure of water meter.		
Safety/precaution	• Apply PPE; • Handle the water meter safely; • Cover the meter with lock.		
Tools, equipment and materials	• Tool box; • Water meter; • Nipple: • Gate valve; • Union; • Socket; • Tee; • Elbow; • Teflon tape; • Water meter; • Gate ball/ valve.		

Task number:	55.		
Task statement:	**Install water pump**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Location with pipe line ready for fixing water pump; **Task:** Install water pump. **Time:** 30 Minutes /installation. **Standard/Criteria:** • Water pump is connected at given location; • One ball valve is installed after pump; • Water metre is connected at minimum 150 mm height from the original ground; • One NRV is installed before joining the water pump; • Water pump is connected following the given instructions and arrow; • The installation is leakage free when tested.		
Related technical knowledge	• Definition and importance of water pump; • Procedure for fitting water pump.		
Safety/precaution	• Handle the water pump safely; • Cover the water pump with lock.		
Tools, equipment and materials	• Tool box, Water pump; • Nipple, gate valve; • Union; • Socket; • Tee; • Elbow; • Teflon tape; • NRV.		

Task number:	56.		
Task statement:	**Install overhead tank**		
Level of task:	Significance	Ease	Occurrence
	2	2	2
Terminal performance standard	**Given Condition** • Sketch or layout drawing; • Location with pipe line ready for joining overhead tank. **Task:** Install overhead tank. **Time:** 30 minutes /installation. **Standard/Criteria:** • Overhead tank is connected with pipes at given location; • One gate valve is installed at outlet pipe; • Overhead tank is installed at minimum 150 mm height from the ground; • Air vent is installed after outlet joint of tank; • Over flow pipe is installed close to inlet point.		
Related technical knowledge	• Definition and importance of overhead tank; • Procedure of fitting overhead tank.		
Safety/precaution	• Make sure the base surface is plane, levelled and horizontal; • Apply PPE.		
Tools, equipment and materials	• Tool box, overhead tank; • Socket, elbow; • Nipple; • Union; • Tank connector; • Tee; • Gate valve/ ball valve.		

Task number:	57.		
Task statement:	**Install solar water heater**		
Level of task:	Significance	Ease	Occurrence
	2	1	2
Terminal performance standard	**Given Condition** • Location with pipes ready for installation of solar heater; • Layout drawing; • Capacity of solar water heater; • Installation manual; **Task:** Install solar water heater **Time:** N/A **Standard/Criteria:** • Solar system is installed as per manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of solar system is set as per the given manual; • Hot water and chilled water pipes are insulated; • Hot and cold water discharged as per the requirement when tested.		
Related technical knowledge	• Definition and importance of solar heating system; • Familiarise with instruction and installation manual; • Pros and cons of water heating system; • Procedure of installation of solar water heater; • Safety protocol of solar water heater.		
Safety/precaution	• Apply PPE and apply safety of solar heater; • Orientation of solar panel is critical; • Handle and operate the solar panel carefully.		
Tools, equipment and materials	• Tool box, solar panel with brackets, power tools; • Hot water tank, plumbing materials and pipe insulation materials.		

Task number:	58.		
Task statement:	**Install heat pump system**		
Level of task:	Significance	Ease	Occurrence
	2	1	1
Terminal performance standard	**Given Condition** • Location; • Layout drawing; • Installation manual: • Capacity of heat pump. **Task:** Install heat pump system. **Time:** N/A **Standard/Criteria:** • The heat pump system is installed as per manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of system is set as per the given manual; • Hot water and chilled water pipes are insulated; • Hot and cold water discharged as per the requirement when tested.		
Related technical knowledge	• Definition and importance of heat pump system; • Familiarise with instruction and installation manual; • Safety protocol of heat pump.		
Safety/precaution	• Apply PPE and apply safety of heat pump system; • Handle and operate the heat pump carefully.		
Tools, equipment and materials	• Tool box; • Power tools; • Plumbing materials; • Pipe insulation materials; • Heat pump and accessories.		

Task number:	59.		
Task statement:	**Install Geyser**		
Level of task:	Significance	Ease	Occurrence
	2	1	2
Terminal performance standard	**Given Condition** • Location; • Layout drawing; • Types of geyser and installation manual. **Task:** Install geyser. **Time:** 2 hours /set **Standard/Criteria:** • Geyser is installed as per given manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of system is set as per the given manual; • Hot water and chilled water pipes are insulated. • Hot and cold water discharged as per the requirement when tested.		
Related technical knowledge	• Definition and importance of geyser; • Familiarise with instruction and installation manual; • Safety protocol of geyser.		
Safety/precaution	• Apply PPE and apply safety protocol of geyser installation; • Handle and operate the geyser carefully.		
Tools, equipment and materials	• Tool box; • Power tools; • Geyser; • Plumbing materials; • Pipe insulation materials.		

Task number:	60.		
Task statement:	**Install Air Condition**		
Level of task:	Significance	Ease	Occurrence
	2	1	1
Terminal performance standard	**Given Condition** • Location; • Layout drawing; • Types of air condition and Installation manual. **Task:** Install air condition. **Time:** 4 hours /installation. **Standard/Criteria:** • The Air condition is installed as per given manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of system is set as per the given manual; • Hot water and chilled water pipes are insulated; • Desired room temperature is maintained when tested.		
Related technical knowledge	• Definition and importance of air condition; • Familiarise with instruction and installation manual; • Safety protocol of air condition installation.		
Safety/precaution	• Apply PPE; • Apply safety of air condition; • Handle and operate the air condition carefully.		
Tools, equipment and materials	• Tool box, Power tools; • Air condition and accessories; • Plumbing materials; • Pipe insulation materials.		

Task number:	**61.**		
Task statement:	**Install room heating system**		
Level of task:	Significance	Ease	Occurrence
	2	1	1
Terminal performance standard	**Given Condition** • Location; • Layout drawing; • Installation manual. **Task:** Install room heating system. **Time:** N/A **Standard/Criteria:** • The room heating system is installed as per given manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of system is set as per the given manual; • Hot water and chilled water pipes are insulated; • Desired room temperature is maintained when the system is run.		
Related technical knowledge	• Definition and importance of room heating system; • Familiarise with instruction and installation manual; • Safety protocol of room heating system.		
Safety/precaution	• Apply PPE and apply safety protocol of room heating system; • Handle and operate the room heating system carefully.		
Tools, equipment and materials	• Tool box; • Power tools; • Room heating; • Plumbing materials; • Pipe insulation materials.		

Task number:	**62.**		
Task statement:	**Install chiller**		
Level of task:	Significance	Ease	Occurrence
	2	1	1
Terminal performance standard	**Given Condition** • Location or site for installation; • Layout or drawing; • Types of chiller and installation manual. **Task:** Install chiller. **Time:** N/A **Standard/Criteria:** • Chiller is installed as per given manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of system is set as per the given manual; • Chilled water pipes are insulated; • Chilling temperature is maintained as per the requirement when tested.		
Related technical knowledge	• Definition and importance of chiller; • Familiarise with instruction and installation manual; • Safety protocol of chiller.		
Safety/precaution	• Apply PPE and apply safety protocol of chiller; • Handle and operate the chiller carefully.		
Tools, equipment and materials	• Tool box; • Power tools; • Chiller; • Plumbing materials; • Pipe insulation materials.		

Task number:	63.		
Task statement:	**Install steamer**		
Level of task:	Significance	Ease	Occurrence
	2	1	1
Terminal performance standard	**Given Condition** • Location; • Layout drawing; • Installation manual. **Task:** Install steamer. **Time:** N/A **Standard/Criteria:** • The steamer is installed as per given manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of system is set as per the given manual; • Humidity and temperature is maintained as per the requirement when tested.		
Related technical knowledge	• Definition and importance of steamer; • Familiarise with instruction and installation manual; • Safety protocol of steamer.		
Safety/precaution	• Apply PPE; • Apply safety protocol of steamer; • Handle and operate the steamer carefully.		
Tools, equipment and materials	• Steamer; • Tool box; • Power tools; • Plumbing materials; • Pipe insulation materials.		

Task number:	64.		
Task statement:	**Install sauna**		
Level of task:	Significance	Ease	Occurrence
	2	1	1
Terminal performance standard	**Given Condition** • Location; • Layout drawing; • Types, capacity and installation manual. **Task:** Install sauna. **Time:** N/A **Standard/Criteria:** • The sauna system is installed as per given manual and layout drawing; • Fitted fittings are free from leakage when tested; • Temperature of sauna system is set as per the given manual; • Desired heat is maintained when tested.		
Related technical knowledge	• Definition and importance of sauna; • Familiarise with instruction and installation manual; • Installation procedure of sauna; • Safety protocol of sauna.		
Safety/precaution	• Apply PPE • Apply safety protocol of sauna; • Handle and operate the sauna system carefully.		
Tools, equipment and materials	• Tool box; • Power tools; • Sauna; • Plumbing materials; • Pipe insulation materials.		

Task number:	65.		
Task statement:	**Install pipe and fittings for Reverse Osmosis (RO) system**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Location or site; • Layout or installation drawing; • Types and capacity of RO system. **Task:** Install pipe and fittings for RO system. **Time:** 1 hour /installation. **Standard/Criteria:** • Pipes, fittings and connections are installed and matched with given layout/ drawing. • Pipe and fittings of RO system are free from leakage when tested; • PH (7) and TDS (Total10-20) is matched when tested; • Working place is cleaned after installation.		
Related technical knowledge	• Definition and importance of RO system; • Installation procedure of RO system; • Explain inlet and outlet function of RO system.		
Safety/precaution	• Apply PPE; • Handle brittle parts carefully.		
Tools, equipment and materials	• Tool Box; • Power tools; • Water source; • RO equipment.		

Task number:	66.		
Task statement:	**Install pipe and fittings for pre-filter**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Location or site; • Inlet of main water source; • Types and capacity or pre-filter; • Layout or drawing of installation site. **Task:** Install pipe and fittings for pre-filter. **Time:** N/A **Standard/Criteria:** • Pipe, fittings and connections are installed and matched with given layout drawing. • Pipes and fittings are installed as per given manual and layout drawing; • Pipe and fittings of pre-filter are free from leakage when tested.		
Related technical knowledge	• Definition and importance of filtration system; • Installation procedure of pre-filter; • Explain inlet and outlet function of filtration device.		
Safety/precaution	• Apply PPE; • Handle brittle parts carefully.		
Tools, equipment and materials	• Tool box; • Pre-filter device; • Power tools.		

Task number:	67.		
Task statement:	**Install pipe and fittings for bio-sand filter**		
Level of task:	Significance	Ease	Occurrence
	3	2	2
Terminal performance standard	**Given Condition** • Location at the main source after aeration process; • Layout or drawing. **Task:** Install pipe and fittings for bio-sand filter. **Time:** N/A **Standard/Criteria:** • Pipes, fittings and connections are installed and matched with given layout drawing. • Pipe and fittings of bio-sand filter are free from leakage when tested; • Pipes are connected after the aeration process; • All large filtration materials are kept at bottom.		
Related technical knowledge	• Definition and importance of filtration system; • Familiarise with instruction and installation manual; • Explain inlet and outlet function of filtration device; • Explain filtration materials and its functions.		
Safety/precaution	• Apply PPE; • Handle brittle parts carefully.		
Tools, equipment and materials	• Tool box; • Power tools, • Pot; • Sand; • Coal, aggregate, pebbles and foam; • Pipe fittings.		

Task number:	68.		
Task statement:	**Install pipe and fittings for Jacuzzi and swimming pool**		
Level of task:	Significance	Ease	Occurrence
	2	2	2
Terminal performance standard	**Given Condition** • Location: Inlet of the swimming pool and Jacuzzi; • Layout or drawing. **Task:** Install pipe and fittings for Jacuzzi and swimming pool. **Time:** N/A **Standard/Criteria:** • Pipe, fittings and connections are installed and matched with given layout or drawing. • Pipe and fittings of Jacuzzi and swimming pool are free from leakage when tested; • Filter device are connected at the inlet of swimming pool and Jacuzzi.		
Related technical knowledge	• Meaning and importance of Jacuzzi and swimming pool; • Definition and importance of filtration system; • Installation procedure of pipe line and fittings in Jacuzzi and swimming pool; • Inlet and outlet functions of filtration; • Different types of filtration devices.		
Safety/precaution	• Apply PPE; • Handle brittle parts carefully.		
Tools, equipment and materials	• Tool box; • Power tools; • Filtration set. • Different types of filtration device; • Pipe fittings.		

Task number:	69.		
Task statement:	**Test pressure of water supply system**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Location with pipe laid; • Installed water supply system; • Standard reference of pressure (10 kg). **Task:** Test pressure of water supply system. **Time:** 10 Minutes /test. **Standard/Criteria:** • The pressure testing is done as per the given standard procedure or • The test result of the performer is as per the test result of the supervisor. (An installed water supply pipes needs to be free from leakage when tested in max. pressure of 10 kg pressure bar test up to 24 hours)		
Related technical knowledge	• Meaning and importance of standard pressure at each point; • Procedure of testing pressure; • Standard pressure bar of water supply system; • Leakage checking procedure.		
Safety/precaution	• Apply PPE; • Barricade the test area till completion of testing...		
Tools, equipment and materials	• Testing pump with PSI meter; • Smoke testing machine; • Tool box tools; • Seal tape (teflon).		

Task number:	70.		
Task statement:	**Test drainage system**		
Level of task:	Significance	Ease	Occurrence
	3	3	1
Terminal performance standard	**Given Condition** • Location or site with pipe laid. **Task:** Test drainage system. **Time:** 10 minutes /test. **Standard/Criteria:** • An installed drainage pipes free from leakage in smoke blower test and flow in sanitary fixtures is free and smooth are accepted.		
Related technical knowledge	• Procedure of testing drainage system ; • Leakage checking in drainage system.		
Safety/precaution	• Apply PPE and barricade test area during testing procedure.		
Tools, equipment and materials	• Smoke testing machine; • Tool box; • Seal tape (teflon); • Sanitary fixtures (floor drain, bath tub, lavatory, urinal, shower and toilet).		

Task number:	71.		
Task statement:	**Demonstrate application process of bathroom, kitchen fitting and fixtures.**		
Level of task:	Significance	Ease	Occurrence
	3	3	2
Terminal performance standard	**Given Condition** • Location with completed all plumbing and sanitation works; • List of critical points needed for demonstration; • Team of family members or users. **Task:** Demonstrate application process of bathroom, kitchen fittings and fixtures. **Time:** 30 Minutes /demonstration (varies depending on types of installation and volume of sanitation works). **Standard/Criteria:** • The safe application of fittings and fixtures are demonstrated to the client; • All critical and important points are covered in demonstration; • The interest/queries of the customer are addressed clearly; • Safe handling of the fittings and fixtures are emphasized.		
Related technical knowledge	• Importance of application process demonstration of sanitary installation; • Functions, procedures, critical points, safety points and instructional manual of all fittings and fixtures.		
Safety/precaution	• N/A		
Tools, equipment and materials	• Tool box; • Note book.		

Task number:	72.		
Task statement:	**Repair leaky tap**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Connected leaky tap, new tap and spare parts. **Task:** Repair leaky tap. **Time:** 15 minutes /tap **Standard/Criteria:** • Leakage problem is troubleshooted; • The tap is replaced with spare parts (washer, spindle); • Leaky tap is replaced with new tap; • Replaced tap is free from leakage when turned on gently; • Working area is cleaned after repairing.		
Related technical knowledge	• Function of main parts of tap • Spare parts for repair and maintenance.		
Safety/precaution	• Apply PPE; • Handle the spare parts of tap carefully.		
Tools, equipment and materials	• Tool box; • Teflon tape; • Spare parts of tap; • New tap.		

Task number:	73.		
Task statement:	**Repair leaky flexible connecting pipe**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Connected connecting pipe with leakage; **Task:** Repair leaky flexible connecting pipe. **Time:** 15 minutes /leakage. **Standard/Criteria:** • Leakage problem is troubleshooted; • Leaked flexible pipe is replaced with spare parts (washer); • The damaged flexible connecting pipe is replaced with new pipe; • Replaced pipe is free from leakage; • Working area is cleaned after repairing.		
Related technical knowledge	• Meaning and importance of flexible connecting pipe; • Spare parts of flexible connecting pipe.		
Safety/precaution	• Apply PPE; • Handle the connecting pipe and its spare parts carefully; • Troubleshoot leakage point of the flexible point carefully.		
Tools, equipment and materials	• Tool box; • Connector; • Spare parts (washer, o-ring, socket).		

Task number:	74.		
Task statement:	**Replace extension nipple**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Location – supply point on wall; • Broken/crack/damage nipple; **Task:** Replace extension nipple. **Time:** 10 minutes /replacement. **Standard/Criteria:** • Damaged extension nipple is removed from the supply point; • Spare nipple is covered with teflon tape and tightened; • Working area is cleaned after replacement.		
Related technical knowledge	• Procedure for removing broken/cracked extension nipple.		
Safety/precaution	• Apply PPE; • Tighten the extension nipple gently without damage.		
Tools, equipment and materials	• Tool box tools; • Connector; • Teflon tape: • Spare nipple.		

Task number:	75.		
Task statement:	**Repair leaky water closet (WC)**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Location or site of leaky WC. **Task:** Repair leaky water closet. **Time:** 25 minutes /closet **Standard/Criteria:** • The leaky water closet is troubleshooted for leakage; • Damaged parts (float cock, syphon, push button, seat cover, washer) are replaced; • The leaky water closet is removed and replaced with new; • New water closet is free from leakage when tested; • Water closet is tested for free and smooth flow of water and sludge; • Working area is cleaned after repairing.		
Related technical knowledge	• Function of WC and its parts; • Trouble shoot leakage spots of WC; • Overview of overall service of WC.		
Safety/precaution	• Apply PPE; • Handle the water closet and its spare parts carefully.		
Tools, equipment and materials	• Tool Box; • Spare parts (float cock, syphon, push button, seat cover, washer).		

Task number:	76.		
Task statement:	**Repair leaky pipe**		
Level of task:	Significance	Ease	Occurrence
	3	3	1
Terminal performance standard	**Given Condition** • Location or site with water seepage area. **Task:** Repair leaky pipe. **Time:** 25 minutes /leakage **Standard/Criteria:** • Leaky pipe is troubleshooted for leakage; • Pipe fittings are replaced; • Damaged leaky pipe is replaced; • Pipe is free from leakage when tested; • Patching and back filling is done; • Working area is cleaned after repairing.		
Related technical knowledge	• Meaning and importance of pipe repairing and pipe fittings.		
Safety/precaution	• Apply PPE; • Handle the pipes and pipe fittings carefully.		
Tools, equipment and materials	• Tool Box; • Patching and back filling tools; • Spare pipe and pipe fittings; • Pressure testing pump; • Teflon tape.		

Task number:	77.		
Task statement:	**Repair back flow**		
Level of task:	Significance	Ease	Occurrence
	3	1	1
Terminal performance standard	**Given Condition** • Blocked manhole, full safety tank or • Air vent absent in drainage or • Not maintained slope in pipe laying or • Pipe sagging condition. **Task:** Repair back flow. **Time:** 1 hour /case **Standard/Criteria:** • Sludge from manhole and safety tank is removed; • Air vent is placed/connected; • Slope/gradient is maintained (Drainage – 3%; Sewage – 1%); • Pipe is lifted and maintained the gradient; • Man hole and pipe is checked for free and smooth flow of water and sludge; • Manhole is tested for back flow; • The pipes are covered with back filling materials; • Working place is cleaned after repairing.		
Related technical knowledge	• Describe cause and effect of back flow; • Rectify the back flow; • List possible solution of back flow.		
Safety/precaution	• Apply PPE; • Handle tools and materials carefully; • Seal manhole tightly; • Clean safety tank regularly; • Lay the pipe at the height of 1 meter below the ground.		
Tools, equipment and materials	• Tool box, patching and back filling tools and materials; • Earth work tools, jumper tools, cast iron rammer (Dhurmus).		

Task number:	78.		
Task statement:	**Repair supply blockage problem**		
Level of task:	Significance	Ease	Occurrence
	3	1	3
Terminal performance standard	**Given Condition** • Supply system with blockage problem; • Air lock or • Existence of insects / external bodies in the pipe. **Task:** Repair supply blockage problem. **Time:** N/A **Standard/Criteria:** • The pipe is troubleshooted for blockage; • Compressor/pressure cum power machines are used to remove the dirt and insects from the supply; • Air release valve is installed at the air lock place; • Supply pipe is tested for free and smooth flow of water; • Other pipes and fitting are ensured free from damage; • Working area is cleaned after repairing.		
Related technical knowledge	• Describe cause and effect of blockage; • Troubleshooting of the blockage; • List of the possible solutions of blockage; • List of the chemicals used for solving blockage.		
Safety/precaution	• Apply PPE and handle the pipes and chemicals carefully.		
Tools, equipment and materials	• Tool box and power tools.		

Task number:	**79.**		
Task statement:	**Fix the water lifting problem on pump**		
Level of task:	Significance	Ease	Occurrence
	3	3	3
Terminal performance standard	**Given Condition** • Water pump with poor water lifting; • Air lock or non-return valve (NRV); • Water source. **Task:** Fix the water lifting problem in pump. **Time:** N/A **Standard/Criteria:** • Pump is troubleshooted for poor water lifting; • Air is released; • NRV is cleaned/replaced; • Water is lifted in full capacity when tested.		
Related technical knowledge	• Importance of cause and effect of poor water lifting in water pump; • Rectifying problem of poor water lifting in water pump; • List out the possible solutions of the problem.		
Safety/precaution	• Apply PPE; • Handle the pump carefully.		
Tools, equipment and materials	• Tool box and NRV.		

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