

RURAL SANITATION AND SANITARY PLUMBING [RSSP]

General Information :

1. Name of the Trade : Rural Sanitation and Sanitary Plumbing
2. Entry Qualification : Passed Class VIII
3. Duration of Training : 06 Months [Under Vocational Short Term Course]

Objective of The Course :

The objective of the course is to impart necessary competencies with the focus on technical competencies, skill and knowledge so that they are able to do plumbing work as well as Sanitation work in the rural area for any structures and fix all types of taps, fittings, toilet arrangement, septic tank installation and drainage work.

Rural sanitation and sanitary plumbing has an important role to develop the sound health and mind of the rural people. In'that connection, plumber has significant role in developing rural sanitary system.

At present, the service of the plumber are more essential in fitting of taps, pipe connections, drainage pipe connections, creation of water basins, urinal flushing arrangement and also attending day to day servicing for those items.

Course Break-up :

(a) Practical instruction	:	288 Hours.
(b) Theoretical instruction	:	67 Hours.
(c) Entrepreneurial Instruction	:	05 Hours
Total		= 360 Hours.

Marks Alloted :

- (a) Practical : 400
- (b) Theory : 100

The Course contents to be covered in less then 26 weeks since some weeks will be used for enrolment procedures, leave of the instructor, holidays, examination and tests, industrial visits etc.

Industrial Visit :

Industrial visit in two different work places is essential.

SYLLABUS
Sub: RURAL SANITATION AND SANITARY PLUMBING
(for 6 months Course)
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| 1. | Introduction to plumbing technology used in plumbing. | 03 hrs. |
| 2. | Apply Mechanical Fundamental and Mathematics
as applicable. | 10 hrs. |
| 3. | Interpret diagrams and drawing used for plumbing work. | 30 hrs. |
| 4. | Knowledge of common tool and equipment for
plumbing' including method of testing. | 50 hrs. |
| 5. | Perform workplace communication. | 08 hrs. |
| 6. | Apply welding and soldering techniques in plumbing. | 20 hrs. |
| 7. | Construction of Septic tanks, Soak Wells, Well type
Latrine based on drawings. | 50 hrs. |
| 8. | Install Plumbing components and fitting. (Practical) | 70 hrs. |
| 9. | Maintain safety at the work site. | 09 hrs. |
| 10. | Provide Customer relations for maintenance/servicing. | 10 hrs. |
| 11. | Demonstration of laying glazed soil pipes, cast iron pipes,
P.V.C. pipes Construction of Masonry Manholes intercepting
Chambers, etc. (Practical Class) | 10 hrs. |
| 12. | Installation Tube well (Shallow & Deep) for Domestic Water
suply, Maintenance of Tube wells. | 30 hrs. |

Total : 360 hrs.

2. Apply Mechanical Fundamentals and Mathematics: (10 Hrs.)

THEORY:

- (a) Simple arithmetical knowledge addition, Subtraction, Multiplication Division.
- (b) Use of units Feet and Inches, Meter and Centimeter; Grams Kilograms etc.
- Knowledge of Decimals
- (c) Measurement of Length, expressing sizes diameter, calculation of area and Volume.
- (d) Mass or Weight of various objects say Cement, Sand, Bricks, Water etc.
- (e) Geometrical property of lines, angles, polygons, circles etc.

Mechanical Terms

- Speed, Velocity, Force, Energy, Work, Power and Efficiency.
- Calculation of Mechanical quantity, Lever system and the Mechanical drive. (a) Pressure, Flow, Force Linear movement, Load, Lift.
- (b) Type of pressure, how they relate to Hydraulic power system. (c) International standard units. (S.I. unit)

3. Interpret diagrams and drawings used for plumbing work: (30 Hrs.)

- (a) Describe the convention used in drawings of Mechanical components.
- (b) Explain the meaning of basic abbreviations and symbols used in drawing.
- (c) Identify mechanical components and their specification from drawing.
- (d) Layout drawing of mechanical components.
- (e) Draw free hand mechanical sketches of the components, Fabrication items.
- (f) Describe Conventions used in construction drawings of building structures etc.
- (g) Identify location of electrical components by symbols used in construction drawing.
- (h) Identify the stages of construction at which the installation of pipe line.
- (i) Fitting used in installation
 - (1) Sanitary Fittings and water conducting equipment.
 - (2) List of area where co-operation of other agency is involved.
 - (3) Identify building materials and their property may effect during installation of pipe lines, fittings etc..
- (j) Identify the type of pipes their origin and route from a piping schedule, (k) Develop a piping schedule for a given installations.

- (I) Develop free hand sketches
 - (1) Draw a piping chart for simple bathroom installations.
 - (2) Draw a circuit to control hot and cold water.
 - (3) Draw piping chart for waste water outlet from the Bathroom.

4. Knowledge of Common tools and equipment for plumbing Work including method of Testing (50 Hrs.)

- (a) Types of Materials traditionally used in engineering application are identified wood, rubber, plastic, metal, concrete.
- (b) Comparison of engineering materials in terms of their performance characterizes, thermal conductivity, Electrical Conductivity, Durability, Wear Resistance.
- (c) Selection of suitable Engineering materials.
- (d) Identification of Hand tools Hacksaw, Hammer, Measuring tape spirit level, reamer, Jointing equipment, Spanners, bench vice, pipe wrench and Threading die chisel. Function of such tools; Maintenance of hand tools after work cleaning, Lubricating, Sharpening, storage and safe keeping.
- (e) Use of power tools for Plumbing Electric drill, grinders.
- (f) Knowledge of Workshop procedures, operations. Cutting, Grinding, Drilling; Threading, fixing or bolting, Bending; removing damaged pipe. Drilling, Nailing, Clipping, Riveting, Hammering.,
- (g) Workshop procedures to be followed during work.
- (h) Use of Power tools (like hand drill and grinders) at job Site Precaution required for use of power tools at job site.
- (i) Use of taps, dies, die nuts, thread files etc.
- (j) Bending of pipe by use of Hydraulic bending Machine.
- (k) Care and Storing of hand tools, power tools.

5. Perform Workplace Communication (8 Hrs.)

- (a) Term roles and responsibilities are identified in terms of structure, purpose.
- (b) Ideas, information and opinions relevant to the task are contributed, classification and information should be collected from group members.
- (c) View points to be clarified, points raised by other group should be answered (to avoid interruption).
- (d) Consensus is attained from all group members.

- (e) Information is accessed from appropriate sources to ensure affective Communication skills applied to inform the groups.
- (f) Assistance is provided to colleagues in the workplace as necessary.
- (g) Requests from colleagues are met properly and willingly,
- (h) Workplace goals are identified and performed.
- (i) Records are kept and in accordance with workplace enterprise, procedures and Government regulations.
- (j) Information is complete, concise and logically organized to achieve target.

6. Apply Welding and Soldering Techniques in Plumbing (20 Hrs.)

- (a) Method of using OXY - acetylene arrangement should be explained System of operating OXY - acetylene plant.
- (b) Method of gas welding, Soldering, Brazing, Heating metal for shaping and cutting. Welding and Brazing procedure and materials required.
- (c) Welding faults and its causes, use of protection and safety guard during Welding.
- (d) Inspection of gas cylinders pressure regulator, hoses, torches, necessary.

7. Construction of Septic Tanks, Soak wells, well type toilet. (50 Hrs.)

- (a) (i) Drawing of septic tank, Material used for Construction of Septic tank. Function of a Septic tank and the capacity based on users.
- (ii) Soak well, construction of soak well, Material used for construction of Soak well.
- (iii) Well type toilets, Method of Construction of well type Toilets.
- (b) Method of Estimation based on Septic tank design.
- (c) Fittings like C.I manhole covers, C.I. pipes for out let inlet.
- (d) (i) Method of Masonry Construction of Septic tank soak wells and well type toilet construction,
- (ii) Finishing of Septic tank, Soak Well, Well type toilet.
- (e) Use of Mason's Tools, Knowledge of Brick masonry, use of cement mortar of various proportion, method of bonding bricks in Masonry work.
- (f) Use of cement concrete, method / knowledge of preparing cement concrete mix, (M10, M15)
- (g) Construction of RC. slab for inspection pit, manholes etc.

8. Installation of Plumbing Components Accessories and Fixture. (70 Hrs.)

Practical

Domestic Water Supply

- (a) Identify different types of pipes used for installation
 - (i) G.I pipe, cast iron pipe, P.V.C pipe, Glazed soil pipe and the purpose of their use.
 - (ii) Proper materials are identified to different applications.
 - (iii) Appropriate pipe fitting are identified according to I.S standard and method of installation.
- (b) Pipe work for domestic water supply, jointing system threading, bolting etc.
 - (i) Selection of G.I. or P.V.C pipes of various dia for Water supply system,
 - (ii) Joining method by use of appropriate fittings, reduction in dia incase of distribution system,
 - (iii) Set out pipe run and install pipe work for domestic water supply. The work involves setting out alignment of pipe. Marking out, the nos. of tapping to be made by providing fittings,
 - (iv) Materials and equipment, tools required according to work place procedures,
 - (v) Pipe work installed according to job specification and tested.

Sanitary accessories and appliances and there installations

- (i) Identify basic types of pipe work and accessories used for Sanitary System.
- (ii) Sanitary appliances- Sink, wash basin, shower, water closet, urinals, Bath tubs, Explain uses of appliances and procedure of installation,
- (iii) Domestic sanitary service accessories Siphons, drains, strainer, lavatory voles (Flushing system) Traps.
- (iv) Domestic appliances and fitting as positioned to measurement according to layout drawing
- (v) Requirement of installation and operational teses
- (vi) TEST the installation - Installation is pressure tested for compliance with job specification and standard, Leaks' detected are rectified.
- (vii) Waste pipe lines for disposal of waste water by Cocealed drain.
- (viii) Method of installation of Cast Iron, Glazed soil pipes, P.V.C pipes for disposal of waste water,

- (ix) Construction Masonry Manhole, intercepting chambers, Master trap pipe, clamping, and inspection,
- (x) Method of jointing pipes and caulking. Manholes with cover, Conducting smoke test after completion of Installment.

9. Maintain Safety at Work Site (09 Hrs.)

- (a) Safety at Work site is most essential. Since the plumbing work is conducted at Ground Level, below ground level and at higher elevations above ground level, it is necessary, that adoption of Safe method of work is ensured.
- (b) Sanitary and plumbing Accessories are made of porcelain, cast iron and plastic, there are possibility that careless handling and placing of such item can cause serious damage to the items as well as injury to a plumber.
- (c) Tools like pipe Wrench, Hammer and chisels etc. used by a plumber are heavy items, If those tool drop from a reasonable height it may lead to injury of the plumber.
- (d) (i) Demonstrate Knowledge of Safe working practices on construction sites,
 - (ii) Carry out safe working practices on construction sites.
- (e) Identify hazards and procedure to avoid accidents at work sites.
- (f) Ensure good house keeping concerning hand tools, portable power tools, scaffolding, excavation of pits, use of ladders, use of chemicals at obscure the concealed erring.
- (g) While lifting heavy items use proper tackles, levels rollers etc. To avoid accidental injury.
- (h) Use of protective Goggles, face shield, safety belt as and when necessary is compulsory,
- (i) Taking undue risk during execution of a job at a construction site should be avoided.
- (j) In any construction site where work is in progress, put up notice for outsiders to avoid the area until the work is completed.

10. Provide Customer relations and estimate a job. (10 Hrs.)

- (a) Obtain the requirement of a customer.
- (b) Importance of customer care and customer services.
- (c) Significance of the good customer and good service to an organization.

- (d) Areas in which standards are identify along with positive attitude for performing the job.
- (e) Communication skill to convince a customer is necessary.
- (f) Analysis of the job and costing should be done and communicated.
- (g) Complete written estimate specifying quality should be given to customer

11. Demonstration of laying glazed soil pipes, cast iron pipes, P V.C pipes. Construction of Masonry Manholes, intercepting Chambers, etc.

12. Installation of hand operated Tube Wells, Deep Tube Wells for domestic water supply. (30 Hrs)

- (a) (i) Hand pump tube wells - the system of hand pump tube wells & its components.
- (ii) Materials required for sinking a hand operated tube well,
- (iii) Maintenance of tube well to ensure its function,
- (b) (i) Deep tube-wells the system of deep tube wells & its components,
- (ii) Materials required for sinking deep tube wells.
- (iii) The electrical pump - pipe line connected to overhead storage tank, supply of electricity.
- (iv) Maintenance of deep tube wells periodic cleaning of overhead storage tanks.

ENTREPRENEURIAL INSTRUCTION

SL No.	Course Curriculum	Hours
1.	Brief idea on nature of small business management and Industrial Technical skill.	
2.	Preparation of schemes and vetting to Financial Institutions/ Lead Bank for obtaining loans.	
3.	Rules for setting up of business / production Unit.	
4.	Maintenance of Accounts; Labour Capital etc.	
5.	Man Management, Communication, Motivation.	
6.	Operational Management.	
7.	Market Survey.	
8.	Quality Control.	
9.	Visit to Industrial units for gathering idea to start the unit.	
10.	Choice of technology as per demand of local people of the District / State.	
11.	Knowledge of Sales Tax etc.	
12.	Brief idea for Registration of SSI, Trade License, Project Report, Proposal for loans etc.	
		Total 05