**CURRICULUM**

**FOR THE TRADE OF**

# SANITARY HARDWARE FITTER

**UNDER**

**APPRENTICESHIP TRAINING SCHEME**

सत्यमेव जयते
Government of India

**GOVERNMENT OF INDIA**
**MINISTRY OF SKILL DEVELOPMENT& ENTREPRENURESHIP**
**DIRECTORATE GENERAL OF TRAINING**

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1. Central Staff Training & Research Institute, Kolkata

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**Co-ordinator for the course:**R.N.MANNA, Training Officer, CSTARI, Kolkata

| Sl. No. | Name & Designation Sh./Mr./Ms. | Organization | Expert Group Designation |
|---|---|---|---|
| **1.** | NirmalyaNath, Astt. Director of Trg. | CSTARI, Kolkata | Expert |
| **2.** | R.N.MANNA, Training Officer | CSTARI, Kolkata | Expert |

# 2. BACKGROUND

## 1.1 Apprenticeship Training Scheme under Apprentice Act 1961

The Apprentices Act, 1961 was enacted with the objective of regulating the programme of training of apprentices in the industry by utilizing the facilities available therein for imparting on-the-job training. The Act makes it obligatory for employers in specified industries to engage apprentices in designated trades to impart Apprenticeship Training on the job in industry to school leavers and person having National Trade Certificate(ITI pass-outs) issued by National Council for Vocational Training (NCVT) to develop skilled manpower for the industry**.** There are four categories of apprentices namely**; trade apprentice, graduate, technician and technician (vocational) apprentices.**

Qualifications and period of apprenticeship training of **trade apprentices** vary from trade to trade. The apprenticeship training for trade apprentices consists of basic training followed by practical training. At the end of the training, the apprentices are required to appear in a trade test conducted by NCVT and those successful in the trade tests are awarded the National Apprenticeship Certificate.

The period of apprenticeship training for graduate (engineers), technician (diploma holders and technician (vocational) apprentices is one year. Certificates are awarded on completion of training by the Department of Education, Ministry of Human Resource Development.

## 1.2 Changes in Industrial Scenario

Recently we have seen huge changes in the Indian industry. The Indian Industry registered an impressive growth during the last decade and half. The number of industries in India have increased manifold in the last fifteen years especially in services and manufacturing sectors. It has been realized that India would become a prosperous and a modern state by raising skill levels, including by engaging a larger proportion of apprentices, will be critical to success; as will stronger collaboration between industry and the trainees to ensure the supply of skilled workforce and drive development through employment. Various initiatives to build up an adequate infrastructure for rapid industrialization and improve the industrial scenario in India have been taken.

## 1.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22$^{nd}$ December, 2014 to make it more responsive to industry and youth. Key amendments are as given below:

- Prescription of number of apprentices to be engaged at establishment level instead of trade-wise.

- Establishment can also engage apprentices in optional trades which are not designated, with the discretion of entry level qualification and syllabus.

- Scope has been extended also to non-engineering occupations.

- Establishments have been permitted to outsource basic training in an institute of their choice.

- The burden of compliance on industry has been reduced significantly.

# 3. RATIONALE

(Need for Apprenticeship in **SANITARY HARDWARE FITTER** trade)

Apprenticeship is a workplace-based training program for people who want to work in a skilled trade.

- the apprenticeship is on-the-job training under the supervision of skilled trades people.
- Apprentices are workers, so they can earn while they learn the trade.

# Benefits of Apprenticeship Training:

*EMPLOYERS:*

- Employers gain a skilled workforce that can produce and deliver goods and services to meet customer demand.

*APPRENTICES:*

- Apprentices earn while they learn a skilled trade.
- Apprenticeships fuel the engine of a strong economy.

Sanitary Hardware Fitter gain experience by performing basic duties of sanitary hardware fitting and aid experienced Sanitary Hardware Fitter. They can enter an apprenticeship where they perform more advanced duties under the supervision of another Sanitary Hardware Fitter.

Sanitary Hardware Fittershould be in good physical health to walk and lift items of sanitary hardware. Cooperation with other professionals is necessary to meet specific goals. An important aspect of Sanitary Hardware Fitteris cost estimation; Sanitary Hardware Fitter must be able to accurately evaluate the cost of Sanitary Hardware Fittingservices and materials required for the work. They should be able to read blueprints and follow structural plans and safety regulations. No matter what part of the country we travel to, the overwhelming concern of every Sanitary Hardware Fitteremployer we meet is where can we find enough quality Sanitary Hardware Fitter to do all of the work? Nationwide, employers are looking for Sanitary Hardware Fitter that is well skilled with the dedication to the trade that the older Sanitary Hardware Fitter exhibited. Of course, they also want to know who can solve the problem.

Apprenticeship programs in Sanitary Hardware Fitterinclude classroom instruction and on-the-job training. Apprentices are sponsored by an employer or government and paid on a scale during training; as they progress in their program, apprentices earn a higher wage and additional job benefits. They also attend classes, to learn knowledge related to their trade. Classroom instruction is part of the apprenticeship, and the combination of classroom teaching and practical experience allows Sanitary Hardware Fitter to become proficient in Fitting of Sanitary Hardware. Apprenticeships are typically arranged by employers or construction industries. The classroom learning in a Sanitary Hardware Fitterapprenticeship includes instruction in reading blueprints, construction math, etc. Apprentices also learn about the tools and materials used in their trade.

Apprentices who complete their program may start work as skilled **Sanitary Hardware Fitter**.

# 4. JOB ROLES: REFERENCE NCO

## Brief description of Job roles:

**7136.10 Sanitary Hardware Fitter / Plumber, General** lays out,assembles, installs and maintains sanitaryfittings and fixtures, sewage and drainagesystems, heating and sanitary systems, gasand water pipe lines etc. Receivesinstructions from Sanitary Engineer or CivilEngineer regarding layout of pipes, water mains, position of fixtures and fittings,etc. Examines drawings or otherspecifications regarding size and dimensionsof area where sanitary fittings or pipe are tobe fitted or laid. Marks points at places toindicate position for fixing brackets andlaying pipes. Drills passage holes in walls orfloor of premises and fixes necessary brackets, stands, holders etc. to keep or holdfittings and fixtures in position, using nuts,bolts, clamps etc. and tightens them with handtools. Cuts reams, threads and bends pipes asappropriate. Ensures that pipe lines are laidproperly. Joins pipes withsockets, Tees, elbow etc. or with molten lead orlead wool. Caulks joints (operation of makingjoint seam tight to withstand pressure) and teststhem for leaks with pneumatic or hydraulicpressure. May repair and maintain sewerageand pipe lines by replacing washers on leakyfaucets, mending burst pipes, opening cloggeddrains, etc.

Reference NCO:**7136.10**

# 5. GENERAL INFORMATION

1. **Name of the Trade** **: SANITARY HARDWARE FITTER**

2. **N.C.O. Code No.** : 7136.10

3. **Duration of Apprenticeship Training**

**(Basic Training + Practical Training): 15 Months**

3.1**Duration of Basic Training**: -

Block –I: 3 months

**Total duration of Basic Training: 3 months**

**Duration of Practical Training (On -job Training): -**

Block–I: 12 months

**Total duration of Practical Training: 12 months**

3.2 **For ITI Passed :-Duration of Basic Training**: - NIL

**Duration of Practical Training (On -job Training): 12 months**

4. **Entry Qualification** : Passed 8th class examination from recognized school

5. **Selection of Apprentices:** The apprentices will be selected as per Apprentices Act amended time to time.

6**. Rebate to ITI Passed out Trainees :Three months** for the trade of **SANITARY HARDWARE FITTER or PLUMBER**

*Note: Industry may impart training as per above time schedule, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspect is compromised and duration of industry training to be remain as 1 year.*

# 6. COURSE STRUCTURE

**Training duration details: -**

| Time (in months) | 1-3 | 4-15 |
|---|---|---|
| **Basic Training** | **Block– I** | **-----** |
| **Practical Training (On - job training)** | **----** | **Block – I** |

| Components of Training | Duration of Training in Months → | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| ↓ | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| **Basic Training Block - I** | | | | | | | | | | | | | | | |
| **Practical Training Block - I** | | | | | | | | | | | | | | | |

# 7. SYLLABUS

## 7.1 BASIC TRAINING

## (BLOCK – I)

## DURATION: 03MONTHS

### GENERAL INFORMATION

1) **Name of the Trade** :**SANITARY HARDWARE FITTER**
2) **Hours of Instruction** : 500Hrs.
3) **Batch size** : 16
4) **Power Norms** : 4.3 KW for Workshop
5) **Space Norms** : 56 Sq.mt.
6) **Examination** : The internal assessment will beheld on completion of the Block.
7) **Instructor Qualification** :

**i)** Degree/Diploma in **Civil / Sanitary**Engg. from recognized university/Board with one/two year post qualification experience respectively in the relevant field.

**OR**

**ii)** NTC/NAC in the trade of **Sanitary Hardware Fitter / Plumber** with three year post qualificationexperience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

8) **Tools, Equipments& Machinery required** : - As per Annexure – I

## 7.1.1 DETAILSYLLABUS OF CORE SKILL

### Block– I
### Basic Training

| Topic No. | a) Engineering Drawing | Duration (in hours) | b) Workshop Science & Calculation | Duration (in hours) |
|---|---|---|---|---|
| 1 | Free hand sketching of straight lines, rectangles, Squares, circles, polygons etc. (IS: 696). | **30** | Applied workshop problems involvingmultiplication and division. Decimaladdition, subtraction, multiplication and division. Conversion of decimal to commonfraction and applied problems. | **20** |
| 2 | Free hand sketching with dimension to scale andProportionate sketching of hacksaw, centre punch, chisel, hammer, calipers, files, vices, taps and dies, holders, etc. | | Applied workshop problems involvingcommon fraction addition, subtraction,multiplication and division. | |
| 3 | Sketching of views of simple bodies. Types of lines - symbol and use. | | • Properties & uses of copper, zinc, lead, tin, aluminum, brass,bronze, solder, bearing metals, timber, rubber, leather, asbestos, plastic materials ceramic asphalt etc.<br>• Reduction of common fraction to decimal fractions, shop problems. | |
| 4 | Simple orthographic projection third angle. | | • CGS, FPS and SI system of units of length, weight and their conversion. | |
| 5 | View of simple hollow and solid bodies with dimensions. | | Percentage and its application - shop problems. | |
| 6 | Symbols used in sanitary their units. Simple isometric drawings | | Ratio and proportion, applied problems. | |
| 7 | Reading of pipeline drawing and isometric drawing of pipeline distribution system. | | Work, power and energy, Applied problems on work, power and energy, | |
| 8 | Simple isometric drawings. Isometric views of simple objects-squares, rectangles, cubes and blocks, etc. | | Friction on plain & inclined surfaces. types of friction, advantage and disadvantage of friction in practical field. Problems on friction**.** | |
| 9 | • Drawing of symbols - pipes, valves and fittings.<br>• Line diagrams of the water service linewith valves and fittings. | | • Centre of Gravity -meaning and location.<br>• Mass, weight and Specific gravity.Shop problems on determination of volume and weight of solid bodies. | |
| 10 | Reading of building plan and marking the position of sanitary fittings, water supply line, drainage line and connection to sewage line. | | Menstruation: areas of rectangle, square, triangle, circle and regular polygon. | |

| | | | | |
|---|---|---|---|---|
| 11 | Longitudinal section of house drain. Drainage arrangements of workshop of an institution. | | Heat andtemperature - their metric scale. Fahrenheit and centigrade scales and their conversion | |
| 12 | Drainagearrangements of an Administrativebuilding. | | Estimation on requirements of materials for pipe layout and installation. | |

## 7.1.2DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

### Block –I

### Basic Training (03 Month)

| Week No. | Professional Skills (275 Hours) | Professional Knowledge (120 Hours) |
|---|---|---|
| 1 | • Importance of safety and general precautions to beobserved in the institute and the section.<br>• Safety precautionsand elementary FirstAid<br>• HandTools : use ofsteel ruleengineers'square,scriber anddividers,hacksaw, centrepunch, differentchisels,hammers,callipers,different files,bench vice andhand vice , taps ,dies and holders.<br>• Chipping, filing to line, drilling holes. Fittingof work piece flat andsquare. Grinding of chisels, Drilling and taping, dieing, making internal and external threads. | • Importance of the trade training machineries. Types of work to be done by trainees in theinstitute.<br>• Common handtools of the tradetheir name,description andmaterial used.<br>• Description ofsimple operations - hack sawing,punching and filing.<br>• Types of files.<br>• Marking instrumentsand their uses.<br>• Description of simple drilling machine. Method of using drills, taps and dies. |
| 2 | • Fasteningdevices -fixing ofmating pairs,check nut,locking pins.<br>• Useof mason handtools : straight edge spirit level, plumb bob, square, etc.<br>• Construction of an inspection chamber of any convenient size. Forming, benching and channeling and Plastering the walls. | • Description of different types of locking and fastening devices.<br>• Description and use of mason's hand tools.<br>• Plain cement concrete, RCC and its proportion, grades of coarse aggregate and fine aggregate, Jhama-concrete with cement mortar and lime mortar.<br>• Knowledge of waterproofing compound, inspection chamber, septic tank. |
| 3 | • Threading pipe of various sizes. Fixing of different fittings.<br>• Identification, demonstration, use and care of the plumber's hand tools and equipments and precaution to be observed.<br>• Cutting pipes of different metals of different dimensions. | • Different kinds of joints in joining pipes (GI, CI, PVC/CPVC and HDPE etc.).<br>• Description and use of plumber's tools and equipments -ratchet brace, threading die, steel son wrench, sliding wrench, spanner set, plumber kit (tam pin, bent pin,plumber's hammers dressers, mallets, wedges, draw knife and step turner), wrench etc. Care and use of tools andtheir safety. |
| 4 | • Fixing of rain water pipe, draining of rainwater and ground water.<br>• Fixing of waste pipe of cast iron, PVC and asbestos cement with suitable bends and junction joining with lead and cement.<br>• Fixing of vent pipe for soil and waste pipe, anti-siphonage pipes. | • Materials used in sanitary hardware work - brass, copper, zinc, lead tin, solder, gun metal, etc. White lead and red lead.<br>• Description of rain water pipe. Single and double pipe system specially used in soil and waste pipe line work.<br>• Description of soil and waste pipe.<br>• Description of vent pipe and its importance. Description of anti siphonage hardware items and fittings. Pipe and its importance. |
| 5 | • Water distribution system. | • Distribution system for OHR. |

| | | |
|---|---|---|
| | • Fixing of floor traps in kitchen and bath. Threading of GI pipes, using pipe die of various sizes, steps of simple pipe connection. | • Description of traps, valves. Types of traps, valves.<br>• Method of testing of soil and waste pipes. |
| 6 | • Layout of water pipe connection to the sanitary fittings using different types of valves and fittings. Laying and joining of cast iron pipes (lead pouring and lead caulking) | • Storage tank, distribution of water, intermittent and constant water supply system, gravity system, pumping, storing and distribution of water. |
| 7 | • Reconditioning of taps, valves, cistern and checking for correct functioning.<br>• Practicing on cutting and shapingPVC/HDPE pipes to sizes, use and fixing of PVC/HDPE fittings and joints, layout according to drawing. | • Causes of damage of taps, valves, water meter and tank, etc. Method of rectification and modification. Testing of water leakage (by hydraulic test and smoke test).<br>• Description, IS specification, properties and uses of PVC/HDPE pipe, methods of cutting and preparation of joints. Layout of PVC/HDPE pipes. Saddle connection for house service. |
| 8 | • Installation of Indian and western style water closet with flushing cistern, flush pipe connection, water connection etc. drainage outlet line, inspection chamber.<br>• Installation of urinal basin with automatic flushing, cistern fixing lead waste or PVC waste and connected to the same to the inspection chamber. | • Description of Indian and western style WC. Standard sizes, types, precautions to be observed while installing.<br>• Types of urinal basin, description of flushing devices, tipper automatic tank, syphonic ball, symphonic tank of high level and low level, working principle of flush valve and siphon ball valves, check valves. |
| 9 | • Installation of bath tub with hot and cold water connection with shower, overflow and waster connection, soap dish etc.<br>• Installation of sink with draining board waste outlet and connection with all fittings, water serviceconnection to the sink. | • Description of bath tub and geyser-accessories required for installation.<br>• Description of sink, types and sizes of kitchen sink, pantry sink, bedpan sink, laundry sink, slop sink etc. waste outlet fittings of suitable sizes |
| 10 | • Installation of wash hand basin with lead waste or PVC waste pipe, connecting pillar tap to service line, fixing of mirror plate glass self, towel rail, soap dish, hot and cold taps with pop-up, waste connection to the gully trap or floor trap.<br>• Demonstrating the working principle of bidet washing through range, WC range, urinals flushing arrangement and method of arranging the waste the outlet. | • Description of wash hand basin its standard sizes, types and accessories required for installation, mirror fitting glass self-fitting, towel rail fitting and precautions for their installation.<br>• Importance of introducing trap of the sanitary fitting. Deep seal traps and low seal traps, crown vent materials and sizes. |
| 11 | Fixing of gully trap and connecting the same to the chamber. | Earthwork excavation, laying drain pipes, precautions to be observed, full shoring /partial shoring for the trench, width of the trench corresponding depth of the drain, refilling of trench, testing of drain pipes (pressure smoke, and light test) |
| 12 | Laying and joining of stoneware pipe with the help of straight rail andboning rod,joining ofstoneware pipes,according to soilconditions andwater level. | Conservancy system and water carriage system. Combined system of drain and separate system ofdrain, types of drain,method of settingstraight rail andboning rod andgradients to beallowed to stonewarepipes according tothe size. Selfcleaning velocitysewage system. |

| | | |
|---|---|---|
| 13. | • Providing layoutconnection toseptic tank, soakpit, manhole, ventpipe, etc., andwaste waterdisposal.<br>• Cleaning ofsanitary fittings,scrapping andpainting of pipes,tracing outleakage andrepairing valves,taps, pumps, airlocks in pipe linesand removal. Useof epoxy resin.<br>• Renewal of joint.Renewal ofpacking fromvalves taps andpumps.Determining andlocating the faultsif any for theabove. | • Description of vent pipe and its necessity, traps used in drainage line, Greece trap gully trap, intercepting trap, types of manholes, cesspool,soak pit, septic tank. Size of septic tanks according to the users, dispersion trench.<br>• Corrosion - causes, prevention and remedies. Corrosion due to electrolytic action. Use and reason of packing.<br>• Important points to check the proper working of pipe lines. Recycling system of rainwater.<br>• Estimatingmaterialsrequirement ofsanitary hardwarefrom a buildinglayout. |
| | **Internal Assessment 03days** | |

# 7.1.3 EMPLOYABILITY SKILLS

## GENERAL INFORMATION

| | | | |
|---|---|---|---|
| 1) | **Name of the subject** | **:** | **EMPLOYABILITY SKILLS** |
| 2) | **Applicability** | **:** | ATS- Mandatory for fresher only |
| 3) | **Hours of Instruction** | **:** | **55Hrs.** |
| 4) | **Examination** | **:** | The examination will be held at the end of two years Training by NCVT. |
| 5) | **Instructor Qualification** | **:** | |

**i)MBA/BBA with two years experience or graduate in sociology/social welfare/Economics with two years experience and trained in Employability skill from DGET Institute.**

**And**

**Must have studied in English/Communication Skill and Basic Computer at 12$^{th}$ /diploma level**

**OR**

**ii) Existing Social Study Instructor duly trained in Employability Skill from DGET Institute.**

## 7.1.3.1 SYLLABUS OF EMPLOYABILITY SKILLS

### Block – I
### Basic Training

| Topic No. | Topic | Duration (in hours) |
|---|---|---|
| | **English Literacy** | **7** |
| **1.** | **Reading**<br>Reading and understanding simple sentences about self, work and environment | |
| **2.** | **Writing**<br>Construction of simple sentences Writing simple English | |
| **3.** | **Speaking / Spoken English**<br>Speaking with preparation on self, on family, on friends/ classmates, on know, picture reading gain confidence through role-playing and discussions on current happening job description, asking about someone's job habitual actions. Taking messages, passing messages on and filling in message forms Greeting and introductions office hospitality,Resumes or curriculum vita essential parts, letters of application reference to previous communication. | |
| | **I.T. Literacy** | **10** |
| **1.** | **Basics of Computer**<br>Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer. | |
| **2.** | **Word processing and Worksheet**<br>Basic operating of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables. Printing document.<br>Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets.<br>Use of External memory like pen drive, CD, DVD etc, | |
| **3.** | **Computer Networking and INTERNET**<br>Accessing the Internet using Web Browser, Downloading and Printing Web Pages, Opening an email account and use of email. Social media sites and its implication. | |
| | **Communication Skill** | **18** |
| **1** | **Introduction to Communication Skills**<br>Communication and its importance<br>Principles of Effective communication<br>Types of communication - verbal, non verbal, written, email, talking on phone.<br>Non verbal communication - components-Para-language<br>Body - language<br>Barriers to communication and dealing with barriers. | |
| **2** | **Listening Skills**<br>Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. | |
| **3** | **Motivational Training**<br>Characteristics Essential to Achieving Success<br>The Power of Positive Attitude<br>Self awareness | |

| | | |
|---|---|---|
| | Importance of Commitment<br>Ethics and Values<br>Ways to Motivate Oneself<br>Personal Goal setting and Employability Planning. | |
| **4** | **Facing Interviews**<br>Manners, Etiquettes, Dress code for an interview<br>Do's & Don'ts for an interview | |
| | **Entrepreneurship skill** | **8** |
| **1.** | **Concept of Entrepreneurship**<br>**Entrepreneurship**- Entrepreneurship - Enterprises:-Conceptual issue.<br>Source of business ideas, Entrepreneurial opportunities, The process of setting up a business. | |
| **2.** | **Institutions Support**<br>Role of Various Schemes and Institutes for self-employment i.e. DIC, SIDA, SISI, NSIC, SIDO, Idea for financing/ non financing support agencies to familiarizes with the Policies /Programmes& procedure & the available scheme. | |
| | **Productivity** | |
| **1.** | **Productivity**<br>Definition, Necessity. | |
| **2.** | **Affecting Factors**<br>Skills, Working Aids, Automation, Environment, Motivation<br>How improves or slows down. | |
| **3.** | **Personal Finance Management**<br>Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance. | |
| | **Occupational Safety, Health & Environment Education** | **6** |
| **1** | **Safety & Health**<br>Introduction to Occupational Safety and Health importance of safety and health at workplace. | |
| **2** | **Occupational Hazards**<br>Basic Hazards, Chemical Hazards, Vibro-acoustic Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards. Occupational health, Occupational hygienic, Occupational Diseases/ Disorders & its prevention. | |
| **3** | **Accident & safety**<br>Basic principles for protective equipment.<br>Accident Prevention techniques - control of accidents andsafety measures. | |
| **4** | **First Aid**<br>Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person | |
| | **Labour Welfare Legislation** | |
| 1 | **Welfare Acts**<br>Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Employees Provident Fund Act. | |
| | **Quality Tools** | **6** |
| **1.** | **Quality Consciousness :**<br>Meaning of quality, Quality Characteristic | |
| **2.** | **Quality Circles :**<br>Definition, Advantage of small group activity, objectives of quality Circle, Roles and | |

| | | |
|---|---|---|
| | function of Quality Circles in Organization, Operation of Quality circle. Approaches to starting Quality Circles, Steps for continuation Quality Circles. | |
| **3.** | **House Keeping :**<br>Purpose of Housekeeping, Practice of good Housekeeping. | |
| **4.** | **Quality Tools**<br>Basic quality tools with a few examples | |

## 7.2 PRACTICAL TRAINING (ON-JOB TRAINING)
## (BLOCK – I)
## DURATION: 12MONTHS

## GENERAL INFORMATION

1) **Name of the Trade** :**SANITARY HARDWARE FITTER**
2) **Duration of On-Job Training** : As per Apprenticeship Act amended time to time.
3) **Batch size** : 16
4) **Examination** : i) The internal assessment will be held on completion of the block
   ii) NCVT exam will be conducted at the end of Apprenticeship Training
5) **Instructor Qualification** :

**i)** Degree/Diploma in **Civil / Sanitary**Engg. from recognized university/Board With one/two year post qualification experience in the relevant field.

**OR**

ii) NTC/NAC in the trade of **Sanitary Hardware Fitter / Plumber** with three year post qualificationexperience in the relevant field.

Preference will be given to a candidate with Craft Instructor Certificate (CIC)

6) **Tools, Equipments& Machinery required** : - As per Annexure – II

## 7.2.1 BROAD SKILL COMPONENT TO BE COVERED DURING ON-JOB TRAINING

**BLOCK – I (12 Months)**

**List of Operations** :

(1) Use and Care of the masons hand tools and equipments

(2) Safety precautions to be observed in the shop floor. Occupational health hazards, environmental pollution related to the trade- its causes, consequences, mitigation and control.

(3) Demonstration on Brick laying setting, Construction of gully traps inspection chamber etc.

(4) Demonstration on Construction of inspection chamber

(5) Use & Care of the Plumbers Hand Tools &Equipments

(6) Demonstration on Cutting & Threading of pipes.

(7) Repairing of tabs valves, cistern etc.

(8) Demonstration on Fixing of Floor tabs, Waste Pipe, Soil Pipe, vents Pipe etc.

(9) Cutting & Shipping of PVC / HDPE pipes to sizes and fixing of PVC / HDPE fitting& joining.

(10) Demonstration on Installing / Maintenance Indian style , European style water closet.

(11) Installing / Maintenance a urinal with automatic flushing cistern.

(12) Installing / Maintenance washbasin,sink,bath tub with all necessary connection.

(13) Installing / Maintenance WC range urinal flushing arrangement, west outlet Construction / Maintenance septic tank, soak pit main hole, Main pipe etc.

(14) Cleaning of sanitary fittings.

# 8. ASSESSMENT STANDARD

## 7.1 Assessment Guideline:

Appropriate arrangements should be made to ensure that there will be no artificial barriers to assessment. The nature of special needs should be taken into account while undertaking assessment. Due consideration to be given while assessing for team work, avoidance/reduction of scrape/wastage and disposal of scarp/wastage as per procedure, behavioral attitude and regularity in training.

The following marking pattern to be adopted while assessing:

**a)**Weightage in the range of 60-75% to be allotted during assessment under following performance level:

For this grade, the candidate with occasional guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of an acceptable standard of craftsmanship.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- many tolerances while undertaking different work are in line with those demanded by the component/job.
- a fairly good level of neatness and consistency in the finish
- occasional support in completing the project/job.

**b)**Weightage in the range of above75%- 90% to be allotted during assessment under following performance level:

For this grade, the candidate, with little guidance and showing due regard for safety procedures and practices, has produced work which demonstrates attainment of a reasonable standard of craftsmanship.

In this work there is evidence of:

- good skill levels in the use of hand tools, machine tools and workshop equipment
- the majority of tolerances while undertaking different work are in line with those demanded by the component/job.
- a good level of neatness and consistency in the finish
- little support in completing the project/job

**c)**Weightage in the range of above 90% to be allotted during assessment under following performance level:

For performance in this grade, the candidate, with minimal or no support in organization and execution and with due regard for safety procedures and practices, has produced work which demonstrates attainment of a high standard of craftsmanship.

In this work there is evidence of:

- high skill levels in the use of hand tools, machine tools and workshop equipment
- tolerances while undertaking different work being substantially in line with those demanded by the component/job.
- a high level of neatness and consistency in the finish.
- minimal or no support in completing the project

## 2FINAL ASSESSMENT- ALL INDIA TRADE TEST (SUMMATIVE ASSESSMENT)

| SUBJECTS | Marks | Sessional Marks | Full Marks | Pass Marks | Duration of Exam. |
|---|---|---|---|---|---|
| Practical | **300** | **100** | **400** | **240** | **08 hrs.** |
| Trade Theory | 100 | 20 | 120 | 48 | 3 hrs. |
| Workshop Cal. & Sc. | 50 | 10 | 60 | 24 | 3 hrs. |
| Engineering Drawing | 50 | 20 | 70 | 28 | 4 hrs. |
| Employability Skill | 50 | | 50 | 17 | 2 hrs. |
| **Grand Total** | **550** | **150** | **700** | | |

Note: - The candidate pass in each subject conducted under all India trade test.

# 9. FURTHER LEARNING PATHWAYS

- On successful completion of the course trainees can opt for Diploma course (Lateral entry).[Applicable for candidates only who undergone ATS after CTS]

- On successful completion of the course trainees can opt for CITS course.

**Employment opportunities:**

On successful completion of this course, the candidates shall be gainfully employed in the following industries:

1. Building & construction industries.
2. Service industries
3. Infrastructure organisations
4. Inpublic sector (Central and State) and private industries of related field inIndia & abroad.
5. Self employment

**ANNEXURE – I**

## 10. TOOLS & EQUIPMENT FOR BASIC TRAINING

## INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

## TRADE:SANITARY HARDWARE FITTER

## LIST OF TOOLS & EQUIPMENTS FOR 16 APPRENTICES

### A : TRAINEES TOOL KIT:-

| Sl. No. | Name of the items | Quantity (indicative) |
|---|---|---|
| 1. | Steel rule 300mm. Both in inch and mm. | 17 Nos. |
| 2. | Rule wooden 4 fold 600mm. | 17 Nos. |
| 3. | Hacksaw frame adjustable for 250to 300mm | 17 Nos. |
| 4. | Scriber 200mm. | 17 Nos. |
| 5. | Centre Punch 100mm. | 17 Nos. |
| 6. | Chisel, cold , flat 20x250mm | 17 Nos. |
| 7. | Hammer ball pein 800gms. | 17 Nos. |
| 8. | Hammer ball pein 300gms. | 17 Nos. |
| 9. | File flat rough 300mm. | 17 Nos. |
| 10. | Level sprit Wooden 300mm. | 17 Nos. |
| 11. | Plumb bob 50gms. | 17 Nos. |
| 12. | Trowel 125 | 17 Nos. |
| 13. | Stillson wrench200&300mm. | 17 Nos. |
| 14. | Screw driver 250mm. | 17 Nos. |
| 15. | Wooden mallet small | 17 Nos. |
| 16. | Cutting Pliers 200mm | 17 Nos. |
| 17. | Steel tape 5m | 17 Nos. |

## B :TOOLS INSTRUMENTS AND GENERAL SHOP OUTFITS

| Sl. No. | Name of the items | Quantity (indicative) |
|---|---|---|
| 18. | Surface plate 400x400mm. Grade 1 | lno. |
| 19. | Scribing Block universal 300mm. | lno. |
| 20. | Hand vice jaw 50mm. | 2nos. |
| 21. | File flat smooth 200mm. | 2nos. |
| 22. | File half round rough 300mm. | 2nos. |
| 23. | File square smooth 200mm. | 2nos. |
| 24. | File triangular rough 250mm. | 2nos. |
| 25. | File flat rasp 250mm. | 2nos. |
| 26. | File triangular smooth 200mm. | 2nos. |
| 27. | File square rough 250mm. | 2nos. |
| 28. | Chisel cold flat 20mm.x300mm. | 2nos. |
| 29. | Chisel cross cut 6x150mm IS:402 | 2 nos. |
| 30. | Chisel round nose 3xl50mmIS: 402 | 2nos. |
| 31. | Chisel diamond point 6x150mm | 2nos. |
| 32. | Tap and die set to cut BSP Thread | 1 set |
| 33. | Punch letter set | 1 set |
| 34. | Punch number set | 1 set |
| 35. | Chase wedge 50mm | 3 nos. |
| 36. | Dress lead 350x50mm | 4nos. |
| 37. | Stick setting in 350x50mm | 4nos. |
| 38. | Saw plumber 300mm | 4 nos. |
| 39. | Spanner monkey up to 50mm | 2nos. |
| 40. | Cutter pipe wheel type 6mm to 25 mm | 1 no. |
| 41. | Pipe jointer, lead, universal | 1 no. |
| 42. | Oil stone 150mmx 50mmx 25mm | 3 nos. |
| 43. | Soldering iron , copper fit, fire heated | 4nos. |
| 44. | Snip straight 250mm. | 4nos. |
| 45. | Try square 200mm | 4nos. |
| 46. | Inside calliper 150mm | 4nos. |
| 47. | Caliper outside 150mm | 4nos. |
| 48. | Odd leg calliper 200mm | 4nos. |
| 49. | Tenon saw | 2nos. |
| 50. | Handsaw | 2nos. |
| 51. | Mortice chisel | 2 sets. |
| 52. | Firmer chisel | 2sets. |
| 53. | Mallet medium IS:2922 | 2 sets |
| 54. | Jack plane | 2 sets |
| 55. | Pliers combination 200mm | 2nos. |
| 56. | Blow lamp 500 millilitre | 4nos. |
| 57. | Pipe opener | 1 no. |
| 58. | Washer cutter | 1 no. |
| 59. | Pressing stick | 1 no. |
| 60. | Mandrel | 2 nos. |
| 61. | Plumber kit containing tam pin, bent pin , plumbers hammers dressers, mallets, chase wedges, draw knife and step turner | 2 sets |
| 62. | Bobbin and follower | 2each |

| | | |
|---|---|---|
| 63. | Bend bolt | 2nos. |
| 64. | Sheet lead knife | 2nos. |
| 65. | Chipping knife | 2nos. |
| 66. | Mirror 100x150mm | 2nos. |
| 67. | Splash stick | 1 no. |
| 68. | Soil pot with brush | 1 no. |
| 69. | Pot hook | 1 no. |
| 70. | Turn pin | 1 no |
| 71. | D.E. Spanners 7x8, 10x11, 13x17,19x22, 24x27,IS:2028 | 2 nos. |
| 72. | Branch gimlets | 2 nos. |
| 73. | Bending spring | 1 sets. |
| 74. | Long dumpy | 2 nos. |
| 75. | Short dumpy | 2 nos. |
| 76. | Plumbers ladle | 2nos. |
| 77. | Joining cramp | 2 nos. |
| 78. | Plumbers metal melting pot 10 kg. | 1 nos. |
| 79. | Pipe stocks and dies complete with stocks brushing bushing holders taps and tap wrenches sizes covered to suit pipes of bore dia 6,8, 10, 20, 235, 32,40and 50 mm. | 6 sets |
| 80. | Pipe vice to grip pipes up to 77mm, IS:2587 | 8 nos. |
| 81. | Tool caulking set of 2 | 2 sets |
| 82. | Stillson pattern pipe wrenches 450mm to take pipe upto 52mm dia IS:4003 | 2 sets |
| 83. | Chain pipe wrench 90mm-650mm IS:4223 | 1 no. |
| 84. | Adjustable spanner A 375 IS : 510 | 2 nos. |
| 85. | Anvil 50 or 63 kg. IS :2049 | 1 no. |
| 86. | Pipe bender manually operated | 1 no |
| 87. | Vice leg 75 mm jaw on stand IS 2588 | 1 no |
| 88. | Hand drill 6mm capacity with drill chuck | 1 no |
| 89. | Drill twist ( straight shank ) 3 mm to 6mm | 1 no. |
| 90. | Flat smithy tong | 2 nos. |
| 91. | Working bench 2400 X 1200 X 750mm with 4 vice 125 mm jaws. | 2 nos |
| 92. | Bath tub small size | 1 no |
| 93. | Stop tap water 20 mm IS : 781 | 4 nos. |
| 94. | Wash basin ( 20"* 14"* 10") equivalent metric | 2 nos |
| 95. | Water heater 22 litres | 1 no |
| 96. | Water closer (European type with down type cistern ) | 1 set |
| 97. | Water closer Indian type complete with over head cistern | 1 set |
| 98. | Urinal wall type complete with automatic system | 1 set |
| 99. | Water meter | 2nos. |
| 100. | Steel lockers with 8 drawers | 2nos. |
| 101. | Metal rack 1800 X 1500 X 450mm | 1 no. |
| 102. | Desk | 1 no. |
| 103. | Stool | 1 no. |
| 104. | Black board with easel | 1 no. |
| 105. | Fire extinguisher | 1 no. |
| 106. | Fire buckets with stub | 1 no. |
| 107. | Steel almirah | 1 no. |
| 108. | Ratchet brack with post and clamp flat drill 6 to 35 mm by 0.2 mm | 1 set |
| 109. | Sight rail and banning rod. | 1 each |
| 110. | Double face hammers | 1 set |

| | | |
|---|---|---|
| 111. | Dormat, pickle, spade, Girmale. | 4 nos. |
| 112. | Monkey plier (Gas pliers) | 1 no. |

## C :GENERAL MACHINERY INSTALLATIONS:-

| Sl. No. | Name & Description of Machines | Quantity (indicative) |
|---|---|---|
| 1. | PVC welding plant | 1 no. |
| 2 | Electric pump 1 HP | 1 no. |
| 3 | D.E. pedestal grinder with two wheels 175 rough | 1 no. |
| 4 | Hydraulic pressure machines for testing leakage in GI pipe fitting etc. | 1 no. |
| 5 | Bench drilling machine with chuck and key up to 15 mm | 1 no. |
| 6 | Pipe bender (Hydraulic type ) | 1each |
| 7 | Portable forge 450 mm with hand blower | 1 no. |

**Note: In case of basic training setup by the industry the tools, equipment and machinery available in the industry may also be used for imparting basic training.**

## INFRASTRUCTURE FOR WORKSHOP CALCULATION & SCIENCE AND ENGINEERING DRAWING

## TRADE: SANITARY HARDWARE FITTER

## LIST OF TOOLS& EQUIPMENTS FOR 16 APPRENTICES

1) **Space Norms** : 45 Sq.m.(For Engineering Drawing)

**2) Infrastructure:**

**A : TRAINEES TOOL KIT:-**

| Sl. No. | Name of the items | Quantity (indicative) |
|---|---|---|
| 1. | Draughtsman drawing instrument box | 17 |
| 2. | Set square celluloid $45^0$ (250 X 1.5 mm) | 17 |
| 3. | Set square celluloid $30^0$-$60^0$ (250 X 1.5 mm) | 17 |
| 4. | Mini drafter | 17 |
| 5. | Drawing board (700mm x500 mm) IS: 1444 | 17 |

**B : FURNITURE REQUIRED**

| Sl. No. | Name of the items | Quantity (indicative) |
|---|---|---|
| 1 | Models : Solid & cut section | as required |
| 2 | Drawing Table for trainees | as required |
| 3 | Stool for trainees | as required |
| 4 | Cupboard (big) | 01 |
| 5 | White Board (size: 8ft. x 4ft.) | 01 |
| 6 | Trainer's Table | 01 |
| 7 | Trainer's Chair | 01 |

**ANNEXURE – II**

## 11.INFRASTRUCTURE FOR ON-JOB TRAINING

## TRADE: SANITARY HARDWARE FITTER

## For Batch of 16APPRENTICES

Actual training will depend on the existing facilities available in the establishment. However, the industry should ensure that the broad skills defined against On-Job– Training part (i.e. 12 months) are imparted. In case of any short fall the concerned industry may impart the training in cluster mode / in any other industry / at ITI.

**ANNEXURE-III**

## 12. GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1.Due care to be taken for proper & inclusive delivery among the batch. Some of the following some method of delivery may be adopted:

A) LECTURE
B) LESSON
C) DEMONSTRATION
D) PRACTICE
E) GROUP DISCUSSION
F) DISCUSSION WITH PEER GROUP
G) PROJECT WORK
H) INDUSTRIAL VISIT

2. Maximum utilization of latest form of training viz., audio visual aids, integration of IT, etc. may be adopted.

3. The total hours to be devoted against each topic may be decided with due diligence to safety & with prioritizing transfer of required skills.