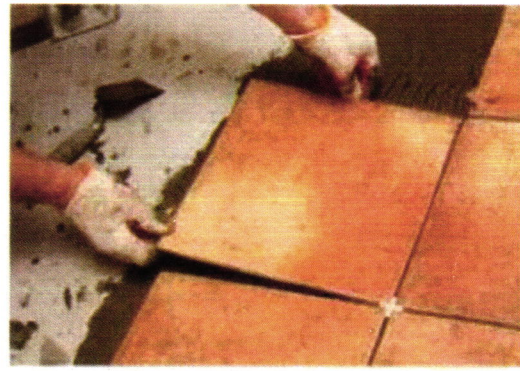




**SYLLABUS FOR THE TRADE OF
MASONRY TECHNICIAN**



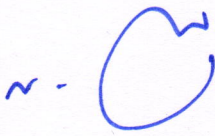
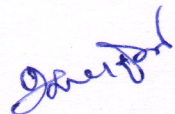

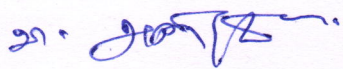
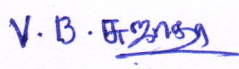
UNDER

INDUSTRIAL SCHOOL PATTERN

By

**DEPARTMENT OF EMPLOYMENT AND TRAINING
GOVERNMENT OF TAMILNADU**

LIST OF COMMITTEE MEMBERS
FOR THE TRADE MASON

Sl No.	Members and Experts	Signature
1	N. Babu, Assistant Director (Exam Cell) Department of Employment and Training, Guindy, Chennai - 600 032	
2	A. Madhini, Assistant Training officer, Govt. Industrial Training Institute, Ambattur, Chennai - 600 098	
3	T. Ramaswamy Assistant Training officer, Govt. Industrial Training Institute, Ambattur, Chennai - 600 098	
4	V. Anantha Krishnan, Assistant Training officer, Govt. Industrial Training Institute, Ambattur, Chennai - 600 098	
5	V.B. Sujatha Assistant Training officer, Govt. Industrial Training Institute, Ambattur, Chennai - 600 098	

COURSE DETAILS

Name of the trade	:	MASONRY TECHNICIAN
Qualification	:	VIII Std Pass
Age	:	14 to 40 years
Duration	:	1 Year
No. of Trainees	:	20
No. of Practical Hours	:	32 Hours per week
No. of Theory Hours	:	8 Hours per week
Workshop calculation	:	2 Hours per week
Engineering Drawing	:	2 Hours per week
Space required		
• Workshop	:	800 Sq.ft (including open yard required for construction)
• Theory	:	200 Sq.ft.
Power required	:	1 KW

Syllabus for the Trade of Masonry Technician – Theory & Practical

Week No.	Trade Theory	Trade Practical
1	Importance of safety, general safety Precautions -Introduction to Trade-its importance & scope. Uses of different tools & equipment used for masonry work and their types.	Familiarization with Institute, importance of Trade training, instruments & equipment used, nature of job done by Masons.
2	Carpenter's hand tools, their names and uses. Sharpening of tools & precautions to be taken.	Marking out for carpentry work. Use of carpenter's hand tools for simple operations like sawing, planing, chiselling, drilling, etc. sharpening of tools.
3	Carpentry joints and their uses. Use of nails, screws, dowels, etc.	Making simple carpentry joints. Centering work. Use of nails, screws, nuts & bolts.
4	Purpose of centering & form work.	Making centering & form work for different heights.
5	Cement, Sand & Mortar. Different types of bricks & their sizes. Sizes of mortar joints for different works. Stretcher & header.	Preparation of cement mortar. Turning a brick for stretcher & header faces. Shaping mortar -spreading on the bed- jointing bricks
6 & 7	Technical terms used in brick masonry. Necessity of bonding bricks. Types of mortars, different grades of sand for brick work & plastering. Grades of cement.	Constructing a 4 ½ "straight wall about 6 courses high with one end stepped and the other racked back. Preparation of various types of mortars.
8 & 9	Characteristics of good bricks. Tiles for roofing & flooring. Purpose of wetting bricks & tiles before use.	Constructing a 4 ½ "quoin wall with one end stepped and the other racked back. Use of plumb rule.
10 & 11	Brickwork-racking back & toothing. Differences between English & Flemish bonds. Details of English & Flemish bond for 1 and 1 ½ brick walls. Precautions at quoins.	Construction of 1 & 1 ½ brick wall junctions in English bonds. Racking out the joints & finishing it flush.
12 to 14	Cross wall-method of construction. Details of bonding & special precautions at 'T', 'L' and cross junctions. Types of copings-weathering & throating.	Construction of 1 & 1 ½ brick wall junctions in Flemish bonds. Racking out the joints & finishing it flush.
15	Types of cement, sand & lime. Types of pointing & tools used. English & Flemish garden wall bonds. PWD specification on brickwork.	Pointing work-different types. Construction of 1 brick thick walls in English & Flemish garden wall bonds.

16	<p>Foundation: Definition, purpose, types, important terms, causes of failure of foundations.</p> <p>Concrete: Ingredients, selection of materials, various ratios of mix, their uses, measuring of materials for mixing.</p>	Mixing plain cement concrete & laying on foundation
17 to 19	<p>Construction of sill with over sailing courses-gauge rod-its purpose. Method of fixing door & window frames. Hold fasts & dowels-purpose and method of fixing. PWD specification on the above.</p> <p>Windows & ventilators: Including steel windows & ventilators, fixtures & fastenings used</p>	Forming door opening & a window opening in a wall in English bond. Construction of sill with over sailing courses. Use of gauge rod. Fixing door & window frames.
20 & 21	<p>Arches: Purpose, technical terms & types.</p> <p>Setting out an arch. Tummel & template for preparing voussoirs & key bricks.</p> <p>Method of constructing centering for an arch.</p>	Spanning of opening with a semi-circular arch, making centering, cutting of templates for voussoirs & preparing voussoirs, setting uprights of arch. Construction of arch & removing centering.
22	RCC lintels: Materials required, method of construction, precast lintels, method of construction of formwork, details of reinforcement.	Pre-casting a lintel-compacting, curing & setting the same in position. Checking for equal bearing.
23	Hollow blocks: Uses, merits & demerits.	Spanning of opening by casting a lintel in site. Construction of shuttering & supports with uprights and wedges. Bending bars & placing reinforcement. Mixing, placing & compacting concrete.
24	<p>Pillars: Necessity, types, relation between cross section & height.</p> <p>Details of reinforcement for square & rectangular pillars.</p>	Construction of detached pillars with footings-square & rectangular types.
25	<p>Cavity wall: Technical terms, advantages, constructional details, precautions to be taken at the bottom of cavity, provision of weep holes & ties, special care at junctions & openings.</p> <p>Scaffolding: Definition,, types, parts, PWD specifications.</p>	Construction of cavity walls, setting out both leaves, provision of wall ties, use of cavity rods.
26	Steps in setting out & marking centre line, excavation line & other lines - checking accuracy & precautions..	<p>Setting out a building: Obtaining first, second, third & fourth lines, marking diagonals, setting out cross walls & offsets.</p> <p>Marking excavation lines & fixing of plinth & floor levels.</p>
27	Revision & Test	Revision & Test

28 to 29	Plastering: Tools used, necessity of screeds & their fixing, steps in plastering.	Plastering of walls-setting of spots-applying mortar-use of screeds & floats. Fixing of screeds to soffits of door & window openings-reversing the screeds & squaring.
30	Hand & machine mixing of concrete-laying and curing of concrete. Water-cement ratio. PWD specifications.	Plastering of ceiling: Application of mortar, strengthening and finishing (Improvise a roof with stone or concrete slab for the purpose of demonstration).
31 & 32	Floors: Types, constructional details such as consolidation of bed, sand filling, concrete base & finishing. Granolithic flooring. Local Municipal byelaws.	Flooring practice: Formation of slope, application of slurry for finishing, setting out of skirting, formation of spots for skirting, use of screeds, formation of curve at the junction of skirting & floor.
33	Purpose of drainage, different systems, their advantages & disadvantages, method of collection, carriage & final disposal of wastage, various types of constructions required.	Drainage: Setting out a drainage line including position of manhole & gully trap.
34	House drainage system-normal layout of drainage. Traps-gully, nahani, etc.-their description. Purpose & method of fixing sanitary fittings such as WC, urinal, washbasin, kitchen sink, etc. construction of surface drains and laying its surface with bricks.	Laying out drainage to required gradients with the help of boning rod and laying its surface with bricks.
35	Drainage pipes: Types, materials, sizes, gradient for different diameters, method of laying & jointing, importance of water tightness, concrete base and covering.	Laying of concrete foundation for drainage pipes and jointing. Checking of alignment. Cutting the pipe to the required length. Covering of drain pipe with concrete as per PWD specification.
36	Septic tank: Purpose, parts and method of construction. Bonding & waterproofing of tank walls. Method of lining field drains with bricks. Shoring for deep trenches. Safety precautions.	Fixing of brackets for washbasin and flushing cistern. Fixing of WC pan, kitchen & bathroom traps, sinks, etc. fixing of vent pipe to walls.
37 & 38	Marble floor: types, constructional details.	Marble work: Method of cutting and setting on stair, floor, wall & pillar.
39	Construction of attached piers & buttresses.	Construction of compound wall with attached piers and coping.
40	Circular walls: Details of construction. Purpose-made bricks.	Construction of a 4 1/2"/9" thick circular brick wall.

41	Setting out and construction of circular gate pillars with brick / tile / concrete.	Construction of circular gate pillars with brick / tile / concrete.
42	Hollow block masonry: Laying of hollow blocks for walls & columns. Use of structural clay tile for partition. Precast concrete partition, metal partition and concrete block partition.	Construction of hollow block walls.
43 to 45	Roofs: Classification, parts, trussed roof, covering materials. RCC work: Mixing, laying, compacting, curing, thumb rule for percentage of reinforcement for lintels, slabs, beams & columns. Necessity hook & cranking. Shear reinforcement.	Simple bar bending practice. Reinforced concrete laying. Construction of roof with prefabricated hollow blocks of beams and slabs
46	Types of external & internal finishes such as rough cast, pebble, dash and stucco-materials used & method of finishing-factors to be kept in mind, PWD specification on the above.	External / internal finishes-practice.
47 & 48	Stairs: Technical terms, relation between tread & rise, types of stairs, construction details of brick, stone & RCC stairs. Spiral stairs with precast concrete steps. Formwork & shuttering-their removal-precautions-PWD specifications.	Flooring: Mosaic, terrazzo, and tile flooring. Laying out a stair on the ground.
49	Use of glazed tiles for wall facing, steps in fixing, precautions. Construction & expansion joints-method of filling-repair of cracks.	Laying of glazed tiles, fixing the thread, filling between ends, plumbing, setting out a jamb, bonding, marking & cutting tiles.
50 & 51	Revision & Test	Revision & Test
52	Final Examination	Final Examination

Syllabus for the Trade of Masonry Technician – Workshop calculation

Week No.	Workshop calculation
1-2	Problems involving multiplication & division of whole numbers.
3-4	Addition, subtraction multiplication & division of fractions.
5-6	Application of fractions to site problems
7-8	Decimals: Addition, subtraction, multiplication & division. Conversion of decimal to fraction and vice-versa. Site problems.
9	Square root of perfect squares-whole numbers & decimals.
10	Metric System: Measurement of length, breadth & height in metric units.
11-12	Measurement of weight in metric system. Unit conversion. Problems.
13-14	Ratio and proportion: Problems to find out quantities of materials for various mortar & concrete mixes.
15-17	Mensuration: Areas & perimeters of rectangles, squares and triangles.
17-20	Areas & perimeters of circles, sectors, segments, quadrilaterals, trapezium, parallelogram & rhombus.
21-22	Problems on areas & perimeters of polygons such as pentagons, hexagons & octagons.
23	Volume & surface area of simple geometrical solids such as cubes & prisms.
24-26	Mensuration applied to area & volume of brickwork. Calculation of cement & sand required.
27-30	Revision & Test
31	Calculation of rise & span for arches.
32-33	Mensuration applied to area of marble works.
34-38	Calculation of length & weight of steel reinforcement from detailed RCC drawings.
39-42	Calculation of quantities of cement, sand, aggregate & reinforcement for a given RCC work.
43-46	Calculation of quantities of various materials for brick/tile/cement concrete/terrazzo flooring. Quantities of materials required for skirting.
47-48	Calculation of length of drainage pipe & materials for foundation & covering concrete.
49-51	Revision & Test
52	Final Examination

Syllabus for the Trade of Masonry Technician – Engineering Drawing

Week No.	Workshop calculation
1-2	Use of different types of lines and symbols for drawing
2-5	Use of drawing instruments - Lettering numbers and alphabets
6-7	Free hand sketching of straight lines, rectangles, squares, circles, polygons etc.
8-9	Freehand sketching of bricks, queen closers, king closers and bats.
10-12	Preparation of freehand sketches in plan & elevation of 4 ½" wall-Quoins & Junctions.
13-14	Preparation of freehand sketches of rat trap bond and other ornamental panels.
15-16	Construction & reading of plain scales. Reading of tapes & foot rules.
17	Different types of lines & symbols used in building drawings.
18-26	Projections of solids.
27-28	Revision & Test
29	Code of practice for general engineering drawing as per ISI.
30-32	Drawing to scale: a) 4 ½" stepped wall, b) 4 ½" wall racked back, c) 9" walls in English & Flemish bonds showing stepped end, racking back & tothing.
33-35	Drawing to scale: a) 4 ½" stepped wall, b) 4 ½" wall racked back, c) 9" walls in English & Flemish bonds showing stepped end, racking back & tothing.
36-38	Drawing to scale: a) 4 ½" quoin wall with stepped end & racking back, b) 4 ½" junction wall, c) 9" quoin wall in English & Flemish bonds, d) 9" Flemish bonded wall junction, e) 9" wall in garden wall bond, f) 13 ½" main wall in garden wall bond & 9" cross wall in English/Flemish bond.
39-40	Preparation of drawings showing methods of setting out simple segmental, circular & elliptical arches.
41-47	Interpretation of building drawing. Preparation of plan, elevation & section of a simple building.
48-49	Reading of a building plan showing drainage line, position of manhole, etc.
50-51	Revision & Test
52	Final Examination.

List of Tools & Equipments for the trade of Masonry Technician

A. Trainees tool kit for 20 trainees and one Instructor

Sl. No.	Description	Quantity
1	Bolster 4" (100mm)	21
2	Pitching tool (mason)	21
3	Chisel (mason) Hammer headed punch	21
4	-do- ½" (12mm)	21
5	-do- 1" (25mm)	21
6	-do- Cross cut type	21
7	-do- ¾" (18mm)	21
8	-do- 1 ½" (35mm)	21
9	Club hammer 1 ½"/1pbs.	21
10	Hammer (mason) brick (600-800gm)	21
11	Helmet	21
12	Leather gloves	21
13	Goggles	21
14	Plumb level 36" (1m)	21
15	Pins (Line)	21
16	Plumb bob	21
17	Steel square	21
18	Plastering trowel-double	21
19	Wooden float	21
20	Trowel-brick 10" (25cm) long	21
21	Trowel-pointing 6" (15cm)	21
22	Tasla (tin) pan	21
23	Wooden straight edge 4'	21
24	Bucket	21

B. General Outfit

Sl. No.	Description	Quantity
1	Spade	4
2	Shovel	4
3	Measuring steel tape 15m	3
4	Measuring tape 30m	2
5	Ladder 2-4m	3
6	Sledge hammer 2 kg & 4 Kg	Each 2
7	Drum (45gallons)	3
8	Hose pipe	60
9	Cellotax board	3
10	Spirit level 6" (15cm)	10
11	Bar bending & cutting tools	2
12	Spirit level 12" (30cm)	5
13	Screw driver	5
14	Pocket steel tape 6' long	20
15	Pickaxe	2
16	Crowbar 1.5m long	3

17	Scrapper	10
18	Snip straight 10" (25cm)	5
19	Carpenter tool kit (a) Handsaw (b) Mortise chisel (c) Tenon saw (d) Firmer chisel (e) Mallet (f) Carpenter claw hammer (g) Hand brace with bits (h) Plane	20 sets
20	Wheel barrow	2
21	Tubular scaffolding	As required
22	Steel measuring boxes (0.6 cft & 1.2 cft)	2 each
23	Adjustable steel props	30
24	Float	10
25	Bending rods	3
26	Spanner set	1
27	Steel shuttering 100 sqm	1 set
28	Tile cutter	1
29	Portable drilling machine	1

C. List of consumables

Sl. No.	Description	Quantity
1	Bricks-traditional bricks, standard bricks, special bricks	As required
2	Tiles-different shapes & sizes	As required
3	Hollow blocks	As required
4	Cement	As required
5	Sand-different grades	As required
6	Lime	As required
7	Coarse aggregate-different sizes	As required
8	Steel reinforcement bars-different diameter	As required
9	Wood for carpentry work	As required
