CURRICULUM

FOR THE TRADE OF

MASON (Building Constructor)

UNDER

APPRENTICESHIP TRAINING SCHEME (ATS)

सत्यमेव जयते
Government of India

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

CONTENTS

1. ACKNOWLEDGEMENT

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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.	Nirmalya Nath, Astt. Director of Trg.	CSTARI, Kolkata	Expert
2.	R.N.MANNA, Training Officer	CSTARI, Kolkata	Expert

2. BACKGROUND

2.1 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.

2.2 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.

2.3 Reformation

The Apprentices Act, 1961 has been amended and brought into effect from 22nd 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.

[Please do not make any changes in the background content]

3. RATIONALE

(Need for Apprenticeship in MASON – Building Constructor 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.

Masons gain experience by performing basic construction duties and aid experienced masons. They can enter an apprenticeship where they perform more advanced duties under the supervision of another mason.

Masons should be in good physical health to walk and lift blocks, bricks and stones. Cooperation with other construction professionals is necessary to meet specific goals. An important aspect of masonry is cost estimation; masons must be able to accurately evaluate the cost of masonry services and materials. They should be able to read construction blueprints and follow structural plans and safety regulations. No matter what part of the country we travel to, the overwhelming concern of every mason contractor we meet is where can we find enough quality masons to do all of the work? Nationwide, contractors are looking for masons that are well skilled with the dedication to the trade that the older masons exhibited. Of course, they also want to know who can solve the problem.

Apprenticeship programs in masonry include 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 masons to become proficient in masonry. Apprenticeships are typically arranged by contractors or construction industries. The classroom learning in a masonry apprenticeship 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 masons.

4. JOB ROLES: REFERENCE NCO

Brief description of Job roles:

7122.20 Bricklayer, Construction; Brick Mason lays brick with mortar, and other construction material to construct and repair building-walls, arches, floors, pillars and other structures. Receives instructions regarding nature and type of work to be done. Directs Laborers to prepare mortar in required proportions and water bricks. Spreads mortar by trowel over foundation or laid bricks and lays bricks by hand in horizontal rows or designs and shapes as per approved specification.

Taps bricks with trowel to embed them firmly in mortar and ensures correct vertical and horizontal alignment of brick setting by sight or with string and plumb bob. Closes gaps in between bricks by filling with half bricks and mortar and by tapping with trowel. Fixes wooden frames, lay lime concrete over roofing and sets girders in position. May dismantle masonry for reconstruction or facility of work. May do plastering, decoration pointing and repair work. May erect scaffolding.

Reference NCO: 2004 / **7122.20**

5. GENERAL INFORMATION

1. **Name of the Trade : MASON (Building Constructor)**

2. **N.C.O. Code No.** : 2004 / **7122.20**

3. **Duration of Apprenticeship Training (Basic Training + Practical Training) :** 2 years

3.1 **For Freshers :- Duration of Basic Training**: -

a) Block –I : 3 months

b) Block – II : 3 months

Total duration of Basic Training: 6 months

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

a) Block–I: 9 months

b) Block–II : 9 months

Total duration of Practical Training: 18 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 under 10+2 system.

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

6**. Rebate to ITI Passed out Trainees : One year** for the trade of **MASON (Building Constructor)**

Note: Industry may impart training as per above time schedule for different block, 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 aspects is compromised.

6. COURSE STRUCTURE

Training duration details: -

Time (in months)	1-3	4-12	13-15	16-24
Basic Training	Block– I	-----	Block – II	------
Practical Training (On - job training)	----	Block – I	------	Block – II

Components of Training	Duration of Training in Months →																							
↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Basic Training Block - I																								
Practical Training Block - I																								
Basic Training Block - II																								
Practical Training Block - II																								

7. SYLLABUS

7.1 BASIC TRAINING
(BLOCK – I & II)
DURATION: 06 MONTHS

GENERAL INFORMATION

1) **Name of the Trade** : **MASON (Building Constructor)**
2) **Hours of Instruction** : 1000 Hrs. (500 hrs. in each block)
3) **Batch size** : 20
4) **Power Norms** : 2 KW for Workshop
5) **Space Norms** : 80Sq.m.

6) **Examination** : The internal assessment will be held on completion of each Block.
7) **Instructor Qualification** :

i) Degree/Diploma in **CIVIL** 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 **MASON (Building Constructor)** with three year post qualification experience 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 DETAIL SYLLABUS OF CORE SKILL

A. Block– I
Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
1	• Free hand Sketching of masonry tools. • Drawing practice and Properties of lines, angles, triangles, Square, circles & polygons.	**30**	Addition, subtraction multiplication & division of whole numbers and fractions.	**20**
2	• Freehand sketching of bricks, queen closers, king closers and bats. • Freehand sketches in plan & elevation of 4 ½" wall-Quoins & Junctions.		Decimals: Addition, subtraction, multiplication & division. Conversion of decimal to fraction and vice-versa.	
3	• Freehand sketches of rat trap bond and other ornamental panels. • Use of drawing instruments-'T' square, drawing board, etc. Printing of letters & numbers.		Metric System: Measurement of length, breadth & height in metric units Measurement of weight in metric system. Unit conversion. Reading of plain scales. Reading of tapes & foot rules.	
4	• Drawing architectural drawings such as ovolo, cavetto, bolten, scotia, cyma recta, cyma reversa, astragal, etc. • Types of lines & symbols used in building drawings.		Ratio and proportion: Problems to find out quantities of materials for various mortar & concrete mixes.	
5	Simple isometric scaled drawings, isometric views of simple objects such as cubes, cuboids, square & rectangular prism and pyramids, etc.		Mensuration: Areas & perimeters of rectangles, squares and triangles, circles, sectors, segments, quadrilaterals, trapezium, parallelogram & rhombus , polygons such as pentagons, hexagons & octagons.	
			Volume & surface area of simple geometrical solids such as cubes & prisms. Mensuration applied to area & volume of brickwork. Calculation of cement & sand required.	

B. Block- II
Basic Training

Topic No.	a) Engineering Drawing	Duration (in hours)	b) Workshop Science & Calculation	Duration (in hours)
1	• Isometric views of simple objects such as cubes, cuboids, square & rectangular prisms and pyramids. • Projections of solids.	30	• Simple cost comparison between facing bricks & common bricks. Cost comparison between walls built in English/Flemish/garden wall bonds/cavity walls. • Problems on areas. Allowances for simple rectangular window & other openings.	20
2	• 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 & toothing. • 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.		• Weight of walling supported by lintels and arches-simple problems. • Calculation of rise & span for arches.	
3	• Drawing to scale: 18" wall in English garden wall bond. • Hexagonal & octagonal pillars showing bonds and cavities.		• Volume of brickwork in mass retaining walls. • Volume of stonework or concrete work required for a given piece of work.	
4	• Preparation of drawing showing timbering in trenches • Preparation of drawings showing methods of setting out simple segmental, circular & elliptical arches.		• Mensuration applied to area of marble works. • Calculation of length & weight of steel reinforcement from detailed RCC drawings.	
5	• Drawing of setting out a building showing the centre line, width of excavation, foundation concrete, footings and superstructure. Checking of accuracy. • Interpretation of building drawing. Preparation of plan, elevation & section of a simple building.		• Calculation of quantities of cement, sand, aggregate & reinforcement for a given RCC work. • Calculation of quantities of various materials for brick/tile/cement concrete/terrazzo flooring. Quantities of materials required for skirting.	

6	• Reading of a building plan showing drainage line, position of manhole, etc. • Drawing of manhole and inspection chamber with details		• Calculation of length of drainage pipe & materials for foundation & covering concrete. • Calculation of materials required for a manhole from given drawing.	
7	• Constructional details of hollow block roof with precast RCC joints. • Stonework: Drawing of random rubble, coursed rubble & ashlar masonry. Layout of stairs. • Drawing of stone pillar showing architectural moulding.			

7.1.2 DETAIL SYLLABUS OF PROFESSIONAL SKILLS & PROFESSIONAL KNOWLEDGE

A. Block –I

Basic Training

Week No.	Professional Skills (275 Hrs.)	Professional Knowledge (120 Hrs.)
01	• Importance of Trade training, instruments & equipments used, nature of job done by Masons. • Marking out for carpentry work. Use of carpenter's hand tools for simple operations like sawing, planing, chiseling, drilling, etc. grinding of tools.	Importance of safety, general safety precautions-Introduction to Trade-its importance & scope. Uses of different tools & equipments used for masonry work and their types. Carpenter's hand tools, their names and uses. Grinding of tools & precautions to be taken.
02	Making centering & form work. Turning a brick for stretcher & header faces. Shaping mortar -spreading on the bed-jointing bricks.	Purpose of arch centering & form work. Different types of bricks & their sizes. Sizes of mortar joints for different works. Stretcher & header.
03	• Building a 4 ½ "straight wall about 6 courses high with one end stepped and the other raked back. Preparation of various types of mortars. • Building a 4 ½ "quoin wall with one end stepped and the other racked back. Use of plumb rule.	Technical terms used in brick masonry. Necessity of bonding bricks. Types of mortars, different grades of sand for brick work & plastering. Grades of cement. Characteristics of good bricks. Tiles for roofing & flooring. Purpose of wetting bricks & tiles before use.
04	• Construction of 1 & 1 ½ brick wall junctions in English & Flemish bonds. Racking out the joints & finishing it flush. • Pointing work-different types. Construction of 1 brick thick walls in English & Flemish garden wall bonds.	Brickwork-racking back & toothing. Differences between English & Flemish bonds. Details of English & Flemish bond for 1 and 1 ½ brick walls. Precautions at quoins. Cross wall-method of construction. Grouting of mortar, jointing and finishing of brickwork. Types of pointing & tools used. Details of bonding & special precautions at 'T', 'L' and cross junctions. Types of copings-weathering & throating.
05	• Forming a door opening in a wall of English bond. Bonding of jambs & reveals.	Types of cement, sand & lime. English & Flemish garden wall bonds. PWD specification on brickwork. Foundation: Definition, purpose, types, important terms, causes of failure of foundations.
06	• Forming a window opening in a wall in English bond. Construction of sill with oversailing courses. Use of gauge rod. Fixing door & window frames.	Construction of sill with oversailing courses-gauge rod-its purpose. Method of fixing door & window frames. Hold fasts & dowels-purpose and method of fixing. PWD specification on the above.
07	• Spanning of opening with a semicircular arch, making centering, cutting of templates for voussoirs & preparing voussoirs, setting uprights of arch. Construction of arch & removing centering.	Arches: Purpose, technical terms & types. Setting out an arch. Tummel & template for preparing voussoirs & key bricks. Method of constructing centering for an arch.
08	• Pre-casting a lintel-compacting, curing & setting the same in position. Checking for equal bearing.	RCC lintels: Materials required, method of construction, precast lintels, method of

	• 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.	construction of formwork, details of reinforcement. Hollow blocks: Glazed, sand, lime bricks. Uses, merits & demerits.
09	• Construction of detached pillars with footings-square & rectangular types. • Construction of cavity walls, setting out both leaves, provision of wall ties, use of cavity rods.	Pillars: Necessity, types, relation between cross section & height. Details of reinforcement for square & rectangular pillars. 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. Scaffolding: Definition,, types, parts, PWD specifications.
10	• Setting out a building: Obtaining first, second, third & fourth lines, marking diagonals, setting out cross walls & offsets. Marking excavation lines & fixing of plinth & floor levels.	Steps in setting out & marking centre line, excavation line & other lines-use of dead man-checking accuracy & precautions. Windows & ventilators: Including steel windows & ventilators, fixtures & fastenings used.
11	• 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. • Plastering of ceiling: Application of mortar, strengthening and finishing (Improvise a roof with stone or concrete slab for the purpose of demonstration).	Plastering: Tools used, necessity of screeds & their fixing, steps in plastering. Concrete: Ingredients, selection of materials, various ratios of mix, their uses, measuring of materials for mixing. Moulding: Types, purposes, making & using a mould. Architectural terms used in connection with classical mouldings such as architrave, apex, etc. Hand & machine mixing of concrete-laying and curing of concrete. Water-cement ratio. PWD specifications.
12	• 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.	Floors: Types, constructional details such as consolidation of bed, sand filling, concrete base & finishing. Granolithic flooring. Local Municipal byelaws.
13.	Revision	
	Internal Assessment 03days	

B. Block –II
Basic Training

Week No.	Professional Skills (275 Hrs.)	Professional Knowledge (120 Hrs.)
01	• Drainage: Setting out a drainage line including position of manhole & gully trap. • Practice in setting up and reading of dumpy level. • Laying out drainage to required gradients with the help of dumpy level and/or boning rod and laying its surface with bricks.	Different systems of drainage, their advantages & disadvantages, method of collection, carriage & final disposal of wastage, 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.
02	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.	Drainage pipes: Types, materials, sizes, gradient for different diameters, method of laying & jointing, importance of water tightness, concrete base and covering.
03	Laying out foundation concrete and construction of manhole. Method of providing footrests, forming of drain and benching.	Manhole: Standard sizes, necessity, details of construction and benching. Provisions of footrests, drops & cover.
04	• Fixing of brackets for washbasin and flushing cistern. • Fixing of WC pan, kitchen & bathroom traps , sinks, etc. fixing of vent pipe to walls.	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.
05	• Stonework, method of cutting stone in required size from a block. Selection of face & bed. • Construction of stone wall.	Stone masonry: Importance of stone, conversion & dressing. Types of dressing as per ISI specification. Types of stone.
06	• Practice on brick/stone masonry work. • Flooring and roof finishing practice.	Introduction to RCC: Uses, materials, properties and formwork, bending of bars & construction. Reference to ISI code. Reinforced brickwork. Brief description of slabs, beams, lintels, stairs, columns, etc. Ashlar masonry. Types of joint used in ashlar such as chamfered, beveled, etc. through stones & bond stones.
07	• Cutting a sheet metal profile for architectural moulding. Applying the sheet metal mould in forming the mould in stone. • Construction of a rubble masonry wall.	Steps in preparing & moulding stone. Preparation of sheet metal mould. Lifting appliances such as lifting tackles, skips, chains, lewis, etc. Precautions in using them.
08	• Marble work: Method of cutting and setting on stair, floor, wall & pillar. • Construction of compound wall with attached piers and coping.	Marble floor: types, constructional details. Construction of attached piers & buttresses.
09	• Construction of a 4 ½”/9” thick circular brick wall. • Construction of circular gate pillars with brick / stone / tile /concrete.	Circular walls: Details of construction. Setting out and construction of circular gate pillars

		with brick/stone/tile/concrete.
10	Construction of hollow block walls.	Hollow block masonry: Laying of hollow blocks for walls & columns. Use of structural clay tile for partition. Precast concrete partition, metal lathe partition and concrete block partition.
11	• Construction of roof with prefabricated hollow blocks of beams and slabs. • External/internal finishes-practice. • Fixing cement concrete jelly.	RCC work: Mixing, laying, compacting, curing, thumb rule for percentage of reinforcement for lintels, slabs, beams & columns. Necessity hook & cranking. Shear reinforcement. Roofs: Classification, parts, trussed roof, covering materials. 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.
12	• Flooring: Mosaic, terrazzo, and tile flooring. Laying out a stair on the ground. • Laying of glazed tiles, fixing the thread, filling between ends, plumbing, setting out a jamb, bonding, marking & cutting tiles.	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. Use of glazed tiles for wall facing, steps in fixing, precautions. Construction & expansion joints-method of filling-repair of cracks.
13.	Revision	
	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**	**:**	**110 Hrs. (55 hrs. in each block)**
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 12th /diploma level

OR

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

7.1.3.1 SYLLABUS OF EMPLOYABILITY SKILLS

A. Block – I
Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	**15**
1	**Pronunciation :** Accentuation (mode of pronunciation) on simple words, Diction (use of word and speech)	
2	**Functional Grammar** Transformation of sentences, Voice change, Change of tense, Spellings.	
3	**Reading** Reading and understanding simple sentences about self, work and environment	
4	**Writing** Construction of simple sentences Writing simple English	
5	**Speaking / Spoken English** 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. Cardinal (fundamental) numbers ordinal numbers. 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	**15**
1	**Basics of Computer** Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	
2	**Computer Operating System** Basics of Operating System, WINDOWS, The user interface of Windows OS, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of Common applications.	
3	**Word processing and Worksheet** 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. Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets	
4	**Computer Networking and INTERNET** Basic of computer Networks (using real life examples), Definitions of Local Area Network (LAN), Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Meaning of World Wide Web (WWW), Web Browser, Web Site, Web page and Search Engines. 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.	

	Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT - ACT, types of cyber crimes.	
	Communication Skill	**25**
1	**Introduction to Communication Skills** Communication and its importance Principles of Effective communication Types of communication - verbal, non verbal, written, email, talking on phone. Non verbal communication -characteristics, components-Para-language Body - language Barriers to communication and dealing with barriers. Handling nervousness/ discomfort. Case study/Exercise	
2	**Listening Skills** Listening-hearing and listening, effective listening, barriers to effective listening guidelines for effective listening. Triple- A Listening - Attitude, Attention & Adjustment. Active Listening Skills.	
3	**Motivational Training** Characteristics Essential to Achieving Success The Power of Positive Attitude Self awareness Importance of Commitment Ethics and Values Ways to Motivate Oneself Personal Goal setting and Employability Planning. Case study/Exercise	
4	**Facing Interviews** Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview	
5	**Behavioral Skills** Organizational Behavior Problem Solving Confidence Building Attitude Decision making Case study/Exercise	

B. Block– II
Basic Training

Topic No.	Topic	Duration (in hours)
	Entrepreneurship skill	**10**
1	**Concept of Entrepreneurship** **Entrepreneurship**- Entrepreneurship - Enterprises:-Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function of entrepreneurs in relation to the enterprise & relation to the economy, Source of business ideas, Entrepreneurial opportunities, The process of setting up a business.	
2	**Project Preparation & Marketing analysis** Qualities of a good Entrepreneur, SWOT and Risk Analysis. Concept & application of Product Life Cycle (PLC), Sales & distribution Management. Different Between Small Scale & Large Scale Business, Market Survey, Method of marketing, Publicity and advertisement, Marketing Mix.	
3	**Institutions Support** Preparation of Project. 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.	
4	**Investment Procurement** Project formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment procedure - Loan procurement - Banking Processes.	
	Productivity	**10**
1	**Productivity** Definition, Necessity, Meaning of GDP.	
2	**Affecting Factors** Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	
3	**Comparison with developed countries** Comparative productivity in developed countries (viz. Germany, Japan and Australia) in selected industries e.g. Manufacturing, Steel, Mining, Construction etc. Living standards of those countries, wages.	
4	**Personal Finance Management** Banking processes, Handling ATM, KYC registration, safe cash handling, Personal risk and Insurance.	
	Occupational Safety, Health & Environment Education	**10**
1	**Safety & Health** Introduction to Occupational Safety and Health importance of safety and health at workplace.	

2	**Occupational Hazards** 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** Basic principles for protective equipment. Accident Prevention techniques - control of accidents and safety measures.	
4	**First Aid** Care of injured & Sick at the workplaces, First-Aid & Transportation of sick person	
5	**Basic Provisions** Idea of basic provision legislation of India. of safety, health, welfare under legislation of India.	
6	**Ecosystem** Introduction to Environment. Relationship between Society and Environment, Ecosystem and Factors causing imbalance.	
7	**Pollution** Pollution and pollutants including liquid, gaseous, solid and hazardous waste.	
8	**Energy Conservation** Conservation of Energy, re-use and recycle.	
9	**Global warming** Global warming, climate change and Ozone layer depletion.	
10	**Ground Water** Hydrological cycle, ground and surface water, Conservation and Harvesting of water	
11	**Environment** Right attitude towards environment, Maintenance of in -house environment	
	Labour Welfare Legislation	**5**
1	**Welfare Acts** Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's compensation Act.	
	Quality Tools	**5**
1	**Quality Consciousness :** Meaning of quality, Quality Characteristic	
2	**Quality Circles :** 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	**Quality Management System :** Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.	
4	**House Keeping :** Purpose of Housekeeping, Practice of good Housekeeping.	
5	**Quality Tools** Basic quality tools with a few examples	
	Leadership and Team Building skills.	**5**
	Leadership Discipline and Morale Team Work Case Study/ Exercise	
	Meet the Mentor **Role - play as a Supervisor**	**5**

	Organizing and Planning.	**5**
	Time Management Group Dynamics Case Study/ Exercise	

7.2 PRACTICAL TRAINING (ON-JOB TRAINING)
(BLOCK – I & II)
DURATION: 18 MONTHS (9 months in each block)

GENERAL INFORMATION

1) **Name of the Trade** : **MASON (Building Constructor)**

2) **Duration of On-Job Training** : a) Block–I: 9 months
b) Block–II : 9 months

Total duration of Practical Training: 18 months

3) **Batch size** : a)Selection of Apprentices as per apprenticeship guidelines.
b) Max. 20 trainees per group

4) **Examination** : i) The internal assessment will be held on completion of each block
ii) NCVT exam will be conducted at the end of 2nd year.

5) **Instructor Qualification** :

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

OR

ii) NTC/NAC in the trade of **MASON (Building Constructor)** with three year post qualification experience 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

A. BLOCK – I (09 Months)

1. Building straight wall with one end stepped and the other racked back.
2. Building quoin wall with one end stepped and the other racked back. Use of plumb rule.
3. Construction of brick wall junctions in English & Flemish bonds. Racking out the joints & finishing it flush.
4. Pointing work-different types. Construction of thick brick walls in English & Flemish garden wall bonds.
5. Forming door opening in a wall of English bond. Bonding of jambs & reveals.
6. Forming window opening in a wall in English bond. Construction of sill with over sailing courses. Use of gauge rod. Fixing door & window frames.
7. Spanning of opening with a semicircular arch, making centering, cutting of templates for voussoirs & preparing voussoirs, setting uprights of arch. Construction of arch & removing centering.
8. Pre-casting a lintel-compacting, curing & setting the same in position. Checking for equal bearing.
9. 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.
10. Construction of detached pillars with footings-square & rectangular types.
11. Construction of cavity walls, setting out both leaves, provision of wall ties, use of cavity rods.
12. Setting out a building: Obtaining first, second, third & fourth lines, marking diagonals, setting out cross walls & offsets. Marking excavation lines & fixing of plinth & floor levels.
13. Plastering of walls-setting of spots-applying mortar-use of screeds & floats.
14. Fixing of screeds to soffits of door & window openings-reversing the screeds & squaring.
15. Plastering of ceiling: Application of mortar, strengthening and finishing
16. Flooring: 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.

B. BLOCK – II (09 Months)

1. Drainage: Setting out a drainage line including position of manhole & gully trap.
2. Laying out drainage to required gradients with the help of dumpy level and/or boning rod and laying its surface with bricks.
3. 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.
4. Laying out foundation concrete and construction of manhole. Method of providing footrests, forming of drain and benching.
5. Fixing of brackets for washbasin and flushing cistern.
6. Fixing of WC pan, kitchen & bathroom traps , sinks, etc. fixing of vent pipe to walls.
7. Stonework, method of cutting stone in required size from a block. Selection of face & bed.
8. Construction of brick/stone wall.
9. Brick/stone masonry work.
10. Flooring and roof finishing.
11. Cutting a sheet metal profile for architectural moulding. Applying the sheet metal mould in forming the mould in stone.
12. Construction of a rubble masonry wall.
13. Marble work: Method of cutting and setting on stair, floor, wall & pillar.
14. Construction of compound wall with attached piers and coping.
15. Construction of circular brick wall.
16. Construction of circular gate pillars with brick/stone/tile/concrete.
17. Construction of hollow block walls
18. Construction of roof with prefabricated hollow blocks of beams and slabs.
19. External/internal finishing. Fixing cement concrete jelly.
20. Flooring: Mosaic, terrazzo, and tile flooring. Laying out a stair on the ground.
21. Laying of glazed tiles, fixing the thread, filling between ends, plumbing, setting out a jamb, bonding, marking & cutting tiles.

8. ASSESSMENT STANDARD

8.1 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

8.2 8.2 FINAL 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 – if eligibility condition fulfills]

- 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. In public sector (Central and State) and private industries of related field in India & abroad.
5. Self employment

ANNEXURE – I

10. TOOLS & EQUIPMENT FOR BASIC TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONAL KNOWLEDGE

TRADE: MASON (Building Constructor)

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

A : TRAINEES TOOL KIT:-

Sl. No.	Name of the items	Quantity (indicative)
1.	Bolster 4” (100mm)	21 nos.
2.	Pitching tool (mason)	21 nos.
3.	Chisel (mason) Hammer headed punch	21 nos.
4.	-do- ½” (12mm)	21 nos.
5.	-do- 1” (25mm)	21 nos.
6.	-do- Cross cut type	21 nos.
7.	-do- ¾” (18mm)	21 nos.
8.	-do- 1 ½” (35mm)	21 nos.
9.	Club hammer 1 ½”/1pbs	21 nos.
10.	Hammer (mason) brick (600-800gm)	21 nos.
11.	Helmet	21 nos.
12.	Leather gloves	21 nos.
13.	Goggles	21 nos.
14.	Plumb level 36” (1m)	21 nos.
15.	Pins (Line)	21 nos.
16.	Plumb bob	21 nos.
17.	Steel square	21 nos.
18.	Plastering trowel-double	21 nos.

19.	Wooden float	21 nos.
20.	Trowel-brick 10” (25cm) long	21 nos.
21.	Trowel-pointing 6” (15cm)	21 nos.
22.	Tasla (tin) pan	21 nos.
23.	Wooden straight edge 4’	21 nos.
24.	Bucket	21 nos.

B : TOOLS INSTRUMENTS AND GENERAL SHOP OUTFITS

Sl. No.	Name of the items	Quantity (indicative)
1.	Spade	12
2.	Shovel	12
3.	Measuring steel tape 15m	3
4.	Measuring tape 30m	2
5.	Ladder 2-4m	3
6.	Sledge hammer 4kg	3
7.	Drum (45gallons)	3
8.	G.I. pipe 1” (25mm) ϕ	200 Mt.
9.	Hose pipe	60 Mt.
10.	G.I. pipe ½” (12mm) ϕ	200 Mt.
11.	Cellotax board	3 nos.
12.	Spirit level 6” (15cm)	20 nos.
13.	Bar bending & cutting tools	02 sets
14.	Spirit level 12” (30cm)	05 nos.
15.	Screw driver	05 nos.
16.	Pocket steel tape 6’ long	20 nos.
17.	Four-fold foot rule 2’ (60 cm)	
18.	Pickaxe	05 nos.
19.	Crowbar 1.5 m long	03 nos.
20.	Scraper	20 nos.
21.	Snip straight 10” (25cm)	05 nos.
22.	Carpenter tool kit of 20 sets (a) handsaw (b) mortise chisel (c) tenon saw (d) firmer chisel (e) mallet (f) carpenter claw hammer (g) hand brace with bits (h) plane	 01 no. 01 no. 01 no. 01 no. 01 no. 01 no. 01 no. 01 no.
23.	Wheel barrow	05 nos.
24.	Tubular scaffolding	As required
25.	Steel measuring boxes (0.6 cft & 1.2 cft)	04 nos. each
26.	Adjustable steel props	30 nos.

27.	Flat 4'x4'x6'	10 nos.
28.	Bending rods	03 nos.
29.	Dumpy level with stand & staff	03 nos.
30.	Spanner set	01 no.
31.	Steel shuttering 400 sqm	02 sets

Note: Dumpy level need not be provided, if the institute has Surveyor/Draughtsman Civil trade.

C : GENERAL MACHINERY INSTALLATIONS:-

Sl. No.	Name & Description of Machines	Quantity (indicative)
1.	Bench grinder	02 nos.
2	Drilling machine	02 nos.

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: MASON (Building Constructor)

LIST OF TOOLS& EQUIPMENTS FOR 20 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	21
2.	Set square celluloid 45^{o} (250 X 1.5 mm)	21
3.	Set square celluloid 30^{o}-60^{o} (250 X 1.5 mm)	21
4.	Mini drafter	21
5.	Drawing board (700mm x500 mm) IS: 1444	21
6	Architect's & builder's template	21

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: MASON (Building Constructor)

For Batch of 20 APPRENTICES

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. 9 months + 9 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 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.