



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

**COMPETENCY BASED CURRICULUM**

# **MASON (BUILDING CONSTRUCTOR)**

(Duration: One Year)

**CRAFTSMEN TRAINING SCHEME (CTS)  
NSQF LEVEL- 2.5**



**SECTOR – CONSTRUCTION**

**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**

Kolkata-700091

# MASON

## (BUILDING CONSTRUCTOR)

(Engineering Trade)

(Revised in August 2025)

Version: 3.0

**CRAFTSMEN TRAINING SCHEME (CTS)**

**NSQF LEVEL- 2.5**



Directorate General of Training

Developed By

**CENTRAL STAFF TRAINING AND RESEARCH INSTITUTE**

Directorate General of Training  
Ministry of Skill Development and Entrepreneurship  
EN-81, Sector-V, Salt Lake City,  
Kolkata – 700 091  
[www.cstaricalcutta.gov.in](http://www.cstaricalcutta.gov.in)

## CONTENTS

S No.	Topics	Page No.
1.	Course Information	1
2.	Training System	2
3.	Job Role	6
4.	General Information	9
5.	Learning Outcome	11
6.	Assessment Criteria	13
7.	Trade Syllabus	18
8.	Annexure I (List of Trade Tools & Equipment)	28
9.	Annexure II (List of Contributors)	31
10.	Annexure III (Abbreviations)	33

## 1. COURSE INFORMATION

---

During the one-year duration a candidate of Mason (Building Constructor) trade is trained on subjects Professional Skill, Professional Knowledge and Employability Skills related to job roles. In addition to this a candidate is entrusted to make/do project work and Extra Curricular Activities to build up confidence. The practical skills are imparted in simple to complex manner & simultaneously theory subject is taught in the same fashion to apply cognitive knowledge while executing task. The practical part starts with basic constructional work viz. cutting of bricks / stones, Masonry (brick/stone), Cutting of rods, R.C.C work, etc. and finally to constructing building, finishing work, centering shuttering for R.C.C beams, column, lintels etc. at the end of the course. The broad components covered under Professional Skill subject are as below:

The practical part starts with basic constructional parts (Masonry) and the candidate imparted training on allied trades viz., carpenter (which leads to multi-skilling). In the basic carpentry the skills imparted are marking, sawing, Planning, chiseling, measurement, drilling, grinding of tools and observation of all safety aspects is mandatory. The safety aspects cover components like OSH&E, PPE, Fire extinguisher, First Aid etc. Masonry deals with making masonry brick wall as per drawing leaving space for door & window opening, Preparation of R.C.C casting, Construction of cavity wall, laying out of building plan, diagonal check-up, fixing up of excavation lines, Wall & ceiling plastering, making of different types of floor determining and Formation of Slope.

Further, laying of drain pipe, jointing, fittings & fixing of W.C. pan, urinals, gully trap. Construction of manhole etc., Construction of septic tank, Fixing& fittings of wash basin, flushing cistern, sink, vent pipe, etc., Construction of stone wall, Laying of marble on floor & stair, Construction of circular brick & hollow block walls, Preparing & mixing of concrete, formwork, casting of roof slab, beams, lintels, stair, column etc., cutting & setting of glazed tiles to walls, Laying of mosaic, terrazzo & tile flooring, Construction of R.C.C. & Brick stairs are being taught in the practical.

Professional Knowledge subject is simultaneously taught in the same fashion to apply cognitive knowledge while executing task. In addition, components like Physical properties of materials, different types of constructional materials such as bricks, properties of good bricks, various types of cement with their properties, types of bonding in masonry work, foundation related knowledge, about R.C. Care also covered under theory part.

Projects need to be completed by the candidates in a group. In addition to above components the core skills components viz., Workshop calculation & Science, Engineering Drawing, Employability Skills are also covered. These core skills are essential skills which are necessary to perform the job in any given situation.

### 2.1 GENERAL

The Directorate General of Training (DGT) under Ministry of Skill Development & Entrepreneurship offers a range of vocational training courses catering to the need of different sectors of economy/ Labour market. The vocational training programmes are delivered under the aegis of Directorate General of Training (DGT). Craftsman Training Scheme (CTS) with variants and Apprenticeship Training Scheme (ATS) are two pioneer schemes of DGT for strengthening vocational training.

Mason (Building Constructor) trade under CTS is one of the popular courses delivered nationwide through network of ITIs. The course is of one-year duration. It mainly consists of Domain area and Core area. The Domain area (Trade Theory & Practical) imparts professional skills and knowledge, while Core area (Employability Skills) imparts requisite core skills, knowledge and life skills. After passing out the training program, the trainee is awarded National Trade Certificate (NTC) by DGT which is recognized worldwide.

#### **Candidates broadly need to demonstrate that they are able to:**

- Read & interpret technical parameters/document, plan and organize work processes, identify necessary materials and tools;
- Perform task with due consideration to safety rules, accident prevention regulations and environmental protection stipulations;
- Apply professional skill, knowledge, core skills & employability skills while performing jobs.
- Document the technical parameters related to the task undertaken.

### 2.2 PROGRESSION PATHWAYS

- Can join industry as Technician and will progress further as Senior Technician, Supervisor and can rise up to the level of Manager.
- Can become Entrepreneur in the related field.
- Can join Apprenticeship programme in different types of industries leading to National Apprenticeship certificate (NAC).
- Can join Crafts Instructor Training Scheme (CITS) in the trade for becoming instructor in ITIs.
- Can join advanced Diploma (Vocational) courses under DGT as applicable.

## 2.3 COURSE STRUCTURE

Table below depicts the distribution of training hours across various course elements during a period of one year:-

S No.	Course Element	Notional Training Hours
1	Professional Skill (Trade Practical)	840
2	Professional Knowledge (Trade Theory)	240
3	Employability Skills	120
<b>Total</b>		<b>1200</b>
On the Job Training (OJT)/ Group Project *		150
Optional Courses**		240
<b>Grand Total</b>		<b>1590</b>

\* The trainee has to undergo 150 hours of mandatory OJT (On the Job Training) at nearby industry or wherever industry not available then group project has to be done with the supervision of the trade instructor for every year.

\*\* Trainees of one-year or two-year trade can also opt for optional courses of up to 240 hours in each year for obtaining 10th/ 12th class certificate from NIOS along with ITI certification, or, short term courses for extra skills/knowledge.

## 2.4 ASSESSMENT & CERTIFICATION

The trainee will be tested for his/ her skill, knowledge and attitude during the period of course through formative assessment and at the end of the training programme through summative assessment as notified by the DGT from time to time.

a) The **Continuous Assessment** (Internal) during the period of training will be done by **Formative Assessment Method** by testing for assessment criteria listed against learning outcomes. The training institute has to maintain an individual trainee portfolio as detailed in assessment guideline. The marks of internal assessment will be as per the formative assessment template provided on [www.cstaricalcutta.gov.in](http://www.cstaricalcutta.gov.in) or [www.bharatskills.gov.in](http://www.bharatskills.gov.in)

b) The final assessment will be in the form of summative assessment. The AllIndia Trade Test for awarding NTC will be conducted by DGT as per the guidelines. The pattern and marking structure is being notified by DGT from time to time. **The learning outcome and assessment criteria will be the basis for setting question papers for final assessment. The examiner during final**

**examination will also check** the individual trainee's profile as detailed in assessment guideline before giving marks for practical examination.

### **2.4.1 PASS REGULATION**

For the purposes of determining the overall result, weightage of 100% is applied for six months and one year duration courses and 50% weightage is applied to each examination for two years courses. The minimum pass percentage for Trade Practical and Formative assessment are 60% & for all other subjects is 33%.

### **2.4.2 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 the assessment. Due consideration should be given while assessing for teamwork, avoidance/reduction of scrap/wastage and disposal of scrap/waste as per procedure, behavioral attitude, sensitivity to the environment and regularity in training. The sensitivity towards Occupational Safety, Health and Environment (OSHE) and self-learning attitude are to be considered while assessing competency.

Assessment will be evidence based comprising some of the following:

- Job carried out in labs/workshop
- Record book/ daily diary
- Answer sheet of assessment
- Viva-voce
- Progress chart
- Attendance and punctuality
- Assignment
- Project work
- Computer based multiple choice question examination
- Practical Examination

Evidences and records of internal (Formative) assessments are to be preserved until forthcoming examination for audit and verification by examining body. The following marking pattern to be adopted for formative assessment:



<b>Marks Allotted during Assessment</b>	<b>Performance Level</b>	<b>Evidence</b>
Marks between 60% to 75%	For performance in this grade, the candidate should produce work which demonstrates attainment of an acceptable standard of craftsmanship with occasional guidance, and due regard for safety procedures and practices.	<ul style="list-style-type: none"><li>• Demonstration of good skill in the use of hand tools, machine tools and workshop equipment.</li><li>• 60-70% accuracy achieved while undertaking different work with those demanded by the component/job.</li><li>• A fairly good level of neatness and consistency in the finish.</li><li>• Occasional support in completing the project/job.</li></ul>
Marks above 75% to 90%	For this grade, a candidate should produce work which demonstrates attainment of a reasonable standard of craftsmanship, with little guidance, and regard for safety procedures and practices.	<ul style="list-style-type: none"><li>• Good skill levels in the use of hand tools, machine tools and workshop equipment.</li><li>• 70-80% accuracy achieved while undertaking different work with those demanded by the component/job.</li><li>• A good level of neatness and consistency in the finish.</li><li>• Little support in completing the project/job.</li></ul>
Marks Above 90%	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.	<ul style="list-style-type: none"><li>• High skill levels in the use of hand tools, machine tools and workshop equipment.</li><li>• Above 80% accuracy achieved while undertaking different work with those demanded by the component/job.</li><li>• A high level of neatness and consistency in the finish.</li><li>• Minimal or no support in completing the project.</li></ul>

### **Brief Description of Job Roles:**

**Bricklayer, Construction;** Brick Mason lays brick with mortar, and other construction material to construct and repair building walls, arches, chimneys, floors, pillars and other structures. Receives instructions regarding nature and type of work to be done. Directs Labourers 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 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.

**Helper Mason;** needs to support Assistant Mason and Mason which are at level-2 and level-3 in semi-skilled and skilled category for carrying out the related works such as shifting of materials, handling tools, tackles and housekeeping. The responsibilities include site development and clearance, provide support for laying of bricks and blocks, mortar and cement concrete mixing, rendering coat plastering, help in setting and layout, knowing importance of scaffolding and have the basic knowledge in the environment, health, safety pertaining to the trade.

**Plumbing Mason;** is responsible for making masonry manholes, laying pipes in masonry works and other earth work related to plumbing.

**Paviour;** lays bricks and stone on leveled ground to make floors, pavements, streets etc. Receives instructions regarding type of pavement, floor or street to be laid and other specifications and collects materials required. Directs Labourers to level surface for laying bricks and stones for required construction. Lays stone slabs or bricks in line on leveled ground, by sizing them if necessary, with brick hammer and trowel and tapes them to get set firmly in position. Checks alignment while laying using straight edge and spirit level and fills gaps in between with chips, bricks bits, cement etc.; May do pre-stressed and R.C. (reinforced concrete) work.

**Assistant Mason;** needs to work as semiskilled category tradesman and perform tasks under instruction and close supervision of Mason Level-3 as Assistant Mason. He is expected to carry out the setting and layout, laying of bricks and blocks, rendering coat plastering, finishing of concrete, fixing doors and windows in a room/cubical while effectively engaging and supervising the Helper Mason under him for all trade relevant tasks. He should ensure trade specific compliance to environment, health and safety aspects

**Assistant Shuttering Carpenter;** works as semi-skilled category tradesman and performs tasks under instructions and close supervision of Shuttering Carpenter Level-3 as an Assistant Shuttering Carpenter. He is expected to make, assemble, erect and dismantle Conventional/system formwork for all type of in situ and pre-cast RCC work, reading drawings, setting and

layout. He should ensure trade specific compliance of environment, health, safety aspects and should engage and supervise the Helper Shuttering Carpenter under him for all relevant tasks.

**Concrete Placers, Concrete Finishers and Related Workers;** erect reinforced concrete frameworks and structures, make forms for moulding concrete, reinforce concrete surfaces, cement openings in walls or casings for wells, finish and repair cement surfaces.

**Plasterer;** plasters walls, ceilings and other surface of structures with cement, lime, mud or other mortar using hand trowel, level etc. Mixes sand, cement, lime brick powder etc. in required proportion adding water to it to prepare plastering mortar. Wets structure to be plastered with water to ensure proper adherence; spreads plaster with trowel to give preliminary coating. Levels and smoothens primary coat of plaster with straight edge, shapes borders to guide second coating and scratches surface of primary coat to provide bond for subsequent coating. Plasters area to be covered with primary coat and allows it to set for some time ensuring that it does not get dry before final coating. Applies thin layer of finish plastering coat over surface, makes out corners and angles to suit it and smoothens plastered area with straight edge and trowel. Directs and supervises sprinkling of water for curing during plastering and watches drying and final outcome of surface. May undertake ornamental plastering.

**Stone Mason;** Stone Setter/Stone Fixer builds stone walls, pillars and other structures by sizing and setting dressed or undressed stones. Receives instructions regarding nature and type of work to be done. Cuts stones to required size prior to setting by chipping with chisel and other cutting tools and gets them dressed or dresses them if necessary. Gets mortar prepared by labourers and spreads it with trowel bit by bit over area where stones are to be fixed. Fixes stones manually one by one in position and sets them by tapping with hammer. Checks vertical and horizontal alignments of set stones with plumb bob, ensures correct setting by alterations if necessary and fills in gaps in between stone slabs with stone chips and mortar. Removes excess mortar with trowel to smoothen joints and stones to raise structure as required. May dismantle masonry and reset girders if necessary. May do plastering, repairing and ornamental work. May lay stones on leveled ground to construct floors pavements, streets, etc. May erect scaffolding for construction work.

**Tile Setter;** Tile Layer fits and sets tiles to walls, floors and ceilings of buildings according to specified design using cement or other mortar and hand tools. Receives instructions regarding specifications, layout and material to be used. Soaks tiles in water to prepare them for setting. Applies mortar or cement coat over wall with trowel and lays tiles aligned in rows according to pattern. Checks alignment of tiles laid with straight edge, levelling hoard, spirit level etc., makes adjustments if necessary and taps them with trowel handle to get them set firmly. Sprinkles dry cement over freshly laid concrete for laying floor tiles and ensures proper bond between cement and tiles while laying. Cuts and shapes tiles for corner pieces, fills gaps with cement as necessary and ensures proper joining setting and alignment. May erect scaffolding for setting ceiling tiles.

**Reference NCO-2015:**

- (i) 7112.0200 - Bricklayer, Construction
- (ii) 9313.0301 - Helper Mason
- (iii) 7112.0201 - Plumbing Mason
- (iv) 7112.0400 - Paviour
- (v) 7112.0601 - Assistant Mason
- (vi) 7115.0201 - Assistant Shuttering Carpenter
- (vii) 7114.9900 - Concrete Placers, Concrete Finishers and Related workers
- (viii) 7123.0100 - Plasterer
- (ix) 7112.0100 - Stone Mason
- (x) 7122.0100- Tile Setter

**Reference NOS: -**

- |                  |                  |
|------------------|------------------|
| (i) CSC/N9424    | (ix) IES/N9445   |
| (ii) IES/N9447   | (x) IES/N9446    |
| (iii) IES/N9453  | (xi) IES/N9449   |
| (iv) CON/N9432   | (xii) IES/N9451  |
| (v) IES/N9443    | (xiii) IES/N9452 |
| (vi) IES/N9454   | (xiv) CON/N9442  |
| (vii) CON/N9433  | (xv) CSC/N9401   |
| (viii) IES/N9444 | (xvi) CSC/N9402  |

## 4. GENERAL INFORMATION

<b>Name of the Trade</b>	<b>MASON (BUILDING CONSTRUCTOR)</b>
<b>Trade Code</b>	DGT/1035
<b>NCO - 2015</b>	7112.0200, 9313.0301, 7112.0201, 7112.0400, 7112.0601, 7115.0201, 7114.9900, 7123.0100, 7112.0100, 7122.0100
<b>NOS Covered</b>	CSC/N9424, IES/N9447, IES/N9453, CON/N9432, IES/N9443, IES/N9454, CON/N9433, IES/N9444, IES/N9445, IES/N9446, IES/N9449, IES/N9451, IES/N9452, CON/N9442, CSC/N9401, CSC/N9402
<b>NSQF Level</b>	Level-2.5
<b>Duration of the trade</b>	One year
<b>Entry Qualification</b>	Passed 8 <sup>th</sup> class examination
<b>Minimum Age</b>	14 years as on first day of academic session.
<b>Eligibility for PwD</b>	LD, CP, LC, DW, AA, LV, DEAF, AUTISM, SLD, MD
<b>Unit Strength (No. of Student)</b>	24 (There is no separate provision of supernumerary seats)
<b>Space Norms</b>	80 Sq. m
<b>Power Norms</b>	4 KW
<b>Instructors Qualification for:</b>	
<b>Mason (Building Constructor) Trade</b>	<p>B.Voc/Degree in civil engineering from AICTE/UGC recognized Engineering College/ university with <b>one year of teaching or industry experience</b> in the Construction field.</p> <p style="text-align: center;"><b>OR</b></p> <p>03 years Diploma in civil engineering from AICTE/ recognized board of technical education with <b>two years of teaching or industry experience</b> in the Construction field.</p> <p style="text-align: center;"><b>OR</b></p> <p>NTC/NAC passed in the trade of "Mason (Building Constructor)" with <b>three years of teaching or industry experience</b> in the Construction field.</p> <p><b><u>Essential Qualification:</u></b>  Regular/ RPL variants of National Craft Instructor Certificate (NCIC) in Mason trade under DGT.</p>

	<p><b>NOTE: - Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.</b></p>
<b>Workshop Calculation &amp; Science</b>	<p>B.Voc/Degree in Engineering from AICTE/UGC recognized Engineering College/ university with <b>one-year of teaching or industry experience.</b></p> <p style="text-align: center;"><b>OR</b></p> <p>03 years Diploma in Engineering from AICTE/ recognized board of technical education with <b>two years' of teaching or industry experience.</b></p> <p style="text-align: center;"><b>OR</b></p> <p>NTC/ NAC in any one of the engineering trades with three years' <b>of teaching or industry experience.</b></p> <p><b><u>Essential Qualification:</u></b>  Regular / RPL variants of National Craft Instructor Certificate NCIC in any one of the engineering trade or RoDA.</p>
<b>Engineering Drawing</b>	<p>B.Voc/Degree in Engineering from AICTE/UGC recognized Engineering College/ university with <b>one-year of teaching or industry experience.</b></p> <p style="text-align: center;"><b>OR</b></p> <p>03 years Diploma in Engineering from AICTE/ recognized board of technical education with <b>two years' teaching or industry experience.</b></p> <p style="text-align: center;"><b>OR</b></p> <p>NTC/ NAC in any one of the engineering/ Draughtsman group of trades with <b>three years' of teaching or industry experience.</b></p> <p><b><u>Essential Qualification:</u></b>  Regular / RPL variants of National Craft Instructor Certificate (NCIC) in any one of the engineering trades or RoDA.</p>
<b>Employability Skill</b>	<p>MBA/ BBA / Any Graduate/ Diploma in any discipline with <b>Two years' of teaching or industry experience with short term ToT Course</b> in Employability Skills conducted by DGT institutions. (Must have studied English/ Communication Skills and Basic Computer at 12th / Diploma level and above)</p> <p style="text-align: center;"><b>OR</b></p> <p>Existing Social Studies Instructors in ITIs with short term ToT Course in Employability Skills conducted by DGT institutions.</p>
<b>Minimum Age for Instructor</b>	21 Years
<b>List of Tools and Equipment</b>	As per Annexure – I

## 5. LEARNING OUTCOME

Learning outcomes are a reflection of total competencies of a trainee and assessment will be carried out as per the assessment criteria.

### 5.1 LEARNING OUTCOMES

Sl. No.	NOS CODE	Learning Outcome	Duration		
			Practical	Theory	Total
1.	CSC/N9424	Perform wood work with carpenter's tools following safety precautions.	76	14	90
2.	IES/N9447	Plan and organize the work to make masonry brick wall and Block work as per drawing and specification applying different types of tools, materials and check for dimensional accuracy.	145	35	180
3.	IES/N9453	Construct wall leaving space for door & window opening.	25	5	30
4.	CON/N9432	Perform R.C.C casting, rod cutting in different sizes, bending, binding & placing. Mixing & compaction of Concrete with different proportions.	52	8	60
5.	IES/N9443	Perform Construction of cavity wall.	25	5	30
6.	IES/N9454	Perform Laying out of building plan, diagonal check-up, fixing up of excavation lines.	52	8	60
7.	CON/N9433	Perform wall & ceiling plastering with application of mortar, smoothening the surface by using of screeds & floats.	65	10	75
8.	IES/N9444	Make different types of floor with determination and formation of Slope.	52	8	60
9.	IES/N9445	Lay drain pipe, jointing, fittings & fixing of W.C. pan, urinals, gully trap. Construction of manhole etc.	89	31	120
10.	IES/N9446	Construct septic tank. Perform fixing & fittings of wash basin, flushing cistern, sink, vent pipe, etc.	50	10	60

11.	IES/N9444	Lay marble on floor & stair with marking, cutting & complete setting.	25	5	30
12.	IES/N9449	Construct circular brick wall & hollow block walls.	25	5	30
13.	CON/N9432	Prepare & mix concrete, formwork, cutting & bending of bar, casting of roof slab, beams, lintels, stair, column etc.	62	13	75
14.	IES/N9451	Cut & set glazed tiles to walls.	25	5	30
15.	IES/N9452	Lay mosaic, terrazzo & tile flooring. Perform Construction of R.C.C. & Brick stairs.	50	10	60
16.	CON/N9442	Perform scaffolding work	22	8	30
17.	CSC/N9401	Read and apply engineering drawing for different application in the field of work.		30	30
18.	CSC/N9402	Demonstrate basic mathematical concept and principles to perform practical operations.		30	30
<b>Employability Skill</b>				<b>120</b>	<b>120</b>
<b>Grand Total</b>			<b>840</b>	<b>360</b>	<b>1200</b>

## 6. ASSESSMENT CRITERIA

LEARNING OUTCOMES	ASSESSMENT CRITERIA
1. Perform wood work with carpenter's tools following safety precautions. (NOS: CSC/N9424)	<ul style="list-style-type: none"> <li>• Identify the woods and character.</li> <li>• Identify the Carpenter's hand Tools.</li> <li>• Prepare the job as per drawing.</li> <li>• Observe safety procedure during wood cutting, sawing, chiselling, planning as per standard norms and procedures.</li> <li>• Check and verify the job as per drawing</li> </ul>
2. Plan and organize the work to make masonry brick wall and Block work as per drawing and specification applying different types of tools, materials and check for dimensional accuracy. (NOS: IES/N9447)	<ul style="list-style-type: none"> <li>• Identify mason's tools, instruments and equipment and Plan for marking and make this available for use in a timely manner.</li> <li>• Select raw material and visual inspect for defects.</li> <li>• Mark as per specification applying desired mathematical calculation and observing standard procedure.</li> <li>• Perform basic handling of brick, rotating of bricks in one hand and as per specification to make the job.</li> <li>• Make a simple construction of different type of Brick joints with mortar.</li> <li>• Observe safety procedure during above operation as per standard norms and procedures.</li> <li>• Check for dimensional accuracy as per standard procedure.</li> <li>• Avoid waste, ascertain unused materials and components for disposal, store these in an environmentally appropriate manner and prepare for disposal.</li> </ul>
3. Construct wall leaving space for door & window opening. (NOS: IES/N9453)	<ul style="list-style-type: none"> <li>• Study drawing, Identify the door and window opening.</li> <li>• Mark space for door &amp; window.</li> <li>• Make desired space for door &amp; window during masonry work.</li> <li>• Check the opening space as per Drawing.</li> </ul>
4. Perform R.C.C casting, rod cutting in different sizes, bending, binding & placing. Mixing & compaction of	<ul style="list-style-type: none"> <li>• Read and interpret the drawing.</li> <li>• Identify required Mason's hand tools.</li> <li>• Cut rods as per size with cutting tools.</li> <li>• Bend bar (rod) as per drawing with bar bending die.</li> </ul>

<p>Concrete with different proportions. (NOS: CON/N9432)</p>	<ul style="list-style-type: none"> <li>• Check the measurement of bar as per drawing.</li> <li>• Bind rods with proper hand tools as per drawing.</li> <li>• Identify the equipment for mixing concrete.</li> <li>• Mix up simple concrete as per specified ratio.</li> <li>• Laying of concrete and compact as per procedure.</li> <li>• Observe safety procedure during concreting.</li> <li>• Check and verify the job as per drawing.</li> </ul>
<p>5. Perform Construction of cavity wall. (NOS: IES/N9443)</p>	<ul style="list-style-type: none"> <li>• Identify different types of Mason's hand tools.</li> <li>• Identify the Construction materials.</li> <li>• Plan for cavity wall construction.</li> <li>• Make a cavity wall in brick Masonry work.</li> <li>• Check &amp; verify the job as per drawing.</li> </ul>
<p>6. Perform Laying out of building plan, diagonal check-up, fixing up of excavation lines. (NOS: IES/N9454)</p>	<ul style="list-style-type: none"> <li>• Identify different types of Mason's hand tools &amp; equipment's for laying out.</li> <li>• Set right angle on the ground following proper method.</li> <li>• Laying out the building plan.</li> <li>• Check the diagonal.</li> <li>• Mark excavation lines as per Drawing.</li> <li>• Check &amp; verify the work as per drawing.</li> </ul>
<p>7. Perform wall &amp; ceiling plastering with application of mortar, smoothing the surface by using of screeds &amp; floats. (NOS: CON/N9433)</p>	<ul style="list-style-type: none"> <li>• Identify different types of plastering tools.</li> <li>• Make scaffolding as per requirement.</li> <li>• Prepare mortar in specified proportions.</li> <li>• Apply mortar on wall surface &amp; ceiling.</li> <li>• Make plaster work.</li> <li>• Observe safety procedure during plaster.</li> </ul>
<p>8. Make different types of floor with determination and formation of Slope. (NOS: IES/N9444)</p>	<ul style="list-style-type: none"> <li>• Identify different types of floors.</li> <li>• Identify different types of tools required for flooring.</li> <li>• Determine slope and make floor accordingly.</li> <li>• Check and verify the job as per requirements.</li> </ul>
<p>9. Lay drain pipe, jointing, and fittings &amp; fixing of W.C. pan, urinals, gully trap. Construction of manhole etc. (NOS: IES/N9445)</p>	<ul style="list-style-type: none"> <li>• Plan for the desired work and identify tools, instrument and equipment for marking and make this available for use on a timely manner.</li> <li>• Select and prepare raw materials, fittings, etc. and visually inspect for defects.</li> <li>• Mark the position to fix the fittings.</li> <li>• Set up a W.C pan &amp; urinals.</li> </ul>

	<ul style="list-style-type: none"> <li>• Construct a gully trap, manhole.</li> <li>• Observe safety points on above work as per standard norms and guidelines.</li> </ul>
<p>10. Construct septic tank. Perform fixing&amp; fittings of wash basin, flushing cistern, sink, vent pipe, etc. (NOS: IES/N9446)</p>	<ul style="list-style-type: none"> <li>• Read and interpret the drawing.</li> <li>• Mark the position of septic tank for excavation.</li> <li>• Construct Septic tank conforming PWD norms.</li> <li>• Check bonding &amp; waterproofing of tank walls.</li> <li>• Perform lining field drains with bricks.</li> <li>• Check and verify the work as per standard norms and guidelines.</li> <li>• Plan for the work and select the tools, instrument and equipment for the Fixing&amp; fittings of wash basin, flushing cistern, sink, vent pipe, etc.</li> <li>• Mark the position and fix fittings e.g. wash basin, flushing cistern, sink, vent pipe, etc. observing standard procedure and method.</li> <li>• Check and verify the work as per standard norms and guidelines.</li> </ul>
<p>11. Lay marble on floor &amp; stair with marking, cutting &amp; complete setting. (NOS: IES/N9444)</p>	<ul style="list-style-type: none"> <li>• Plan and identify tools and equipment for marking, cutting and make this available for use in a timely manner.</li> <li>• Select raw materials and inspect visually for defect.</li> <li>• Measure, mark and cut marble as required.</li> <li>• Lay marble on floor and stair.</li> <li>• Observe safety procedure during above work as per standard norms.</li> <li>• Check for finishing and dimensional accuracy as per standard procedure.</li> </ul>
<p>12. Construct circular brick wall &amp; hollow block walls. (NOS: IES/N9449)</p>	<ul style="list-style-type: none"> <li>• Plan for the work and arrange materials, tools and equipment for circular / hollow brick work.</li> <li>• Prepare bricks as required in circular / hollow brick wall.</li> <li>• Construct circular / hollow block wall.</li> <li>• Check for finishing and dimensional accuracy as per standard procedure.</li> </ul>

<p>13. Prepare &amp; mix of concrete, formwork, cutting &amp; bending of bar, casting of roof slab, beams, lintels, stair, column etc. (NOS: CON/N9432)</p>	<ul style="list-style-type: none"> <li>• Read and interpret the drawing.</li> <li>• Make shuttering and formwork with proper support.</li> <li>• Perform cutting &amp; bending of bar &amp; bind them as per measurement and drawing.</li> <li>• Perform leveling and check measurement criteria.</li> <li>• Mix concrete and cast roof slab, beams, lintels, stair, column etc. as per measurement and drawing.</li> <li>• Observe safety procedure during above work as per standard norms.</li> </ul>
<p>14. Cut &amp; set of glazed tiles to walls. (NOS: IES/N9451)</p>	<ul style="list-style-type: none"> <li>• Plan for the work and arrange for raw material and different types of plastering, pointing &amp; tile setting tools.</li> <li>• Prepare wall surface and mortar in specified proportions.</li> <li>• Perform pointing to wall and apply mortar on wall surface.</li> <li>• Marking &amp; cutting of glazed tiles as per requirement.</li> <li>• Set glazed tiles to wall and fill joints.</li> <li>• Check for finishing and dimensional accuracy.</li> </ul>
<p>15. Lay mosaic, terrazzo &amp; tile flooring. Perform Construction of R.C.C. &amp; Brick stairs. (NOS: IES/N9452)</p>	<ul style="list-style-type: none"> <li>• Plan for the work and arrange for raw material and different types of tile setting tools.</li> <li>• Prepare floor surface and mortar in specified proportions.</li> <li>• Perform leveling to floor applying mortar on floor surface.</li> <li>• Marking &amp; cutting of floor tiles.</li> <li>• Setting of tiles on floor.</li> <li>• Check for finishing and dimensional accuracy</li> <li>• Read and interpret the drawing.</li> <li>• Make shuttering and formwork with proper support.</li> <li>• Perform cutting &amp; bending of bar &amp; bind them as per measurement and drawing.</li> <li>• Perform leveling and check measurement criteria.</li> <li>• Mix concrete and cast R.C.C stair or perform construction of brick stair as per measurement and drawing.</li> <li>• Observe safety procedure during above work as per standard norms.</li> </ul>

<p>16. Perform scaffolding work (NOS: CON/N9442)</p>	<ul style="list-style-type: none"> <li>• Perform scaffolding work</li> <li>• Follow safety related to scaffolding work</li> </ul>
<p>17. Read and apply engineering drawing for different application in the field of work. (NOS: CSC/N9401)</p>	<ul style="list-style-type: none"> <li>• Read &amp; interpret the information on drawings and apply in executing practical work.</li> <li>• Read &amp; analyze the specification to ascertain the material requirement, tools and assembly/maintenance parameters.</li> <li>• Encounter drawings with missing/unspecified key information and make own calculations to fill in missing dimension/parameters to carry out the work.</li> </ul>
<p>18. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study. (NOS: CSC/N9402)</p>	<ul style="list-style-type: none"> <li>• Solve different mathematical problems</li> <li>• Explain concept of basic science related to the field of study</li> </ul>

## 7. TRADE SYLLABUS

<b>SYLLABUS FOR MASON (BUILDING CONSTRUCTOR) TRADE</b>			
<b>Duration – One Year</b>			
<b>Duration</b>	<b>Reference Learning Outcome</b>	<b>Professional Skills (Trade Practical)</b>	<b>Professional Knowledge (Trade Theory)</b>
Professional Skill 76 Hrs.;  Professional Knowledge 14 Hrs.	1. Perform wood work with carpenter's tools following safety precautions.	<ol style="list-style-type: none"> <li>1. Familiarization with Institute, administrative setup of Institute.</li> <li>2. Rules &amp; resolutions of attendance with leave facility.</li> <li>3. Importance of Trade training, instruments &amp; equipment's used.</li> <li>4. Importance of trade training, List of tools &amp; Machinery used in the trade.</li> <li>5. Safety attitude development of the trainee by educating them to use Personal Protective Equipment (PPE).</li> <li>6. First Aid Method and basic training.</li> <li>7. Safe disposal of waste materials like Pieces of wood, rod, stone, mud, etc.</li> <li>8. Hazard identification and avoidance.</li> <li>9. Safety signs for Danger, Warning, caution &amp; personal safety message.</li> <li>10. Preventive measures for electrical accidents &amp; steps to be taken in such accidents.</li> <li>11. Use of Fire extinguishers.</li> </ol>	<ul style="list-style-type: none"> <li>● Importance of safety and general precautions required for the trade.</li> <li>● Importance of the trade.</li> <li>● Types of work to be done by trainees in the institute.</li> <li>● Scope of a mason work.</li> <li>● Types of services has to plan.</li> <li>● Role of a mason, nature of job done by masons</li> </ul>

		<p>12. Practice and understand precautions to be followed while working in mason jobs.</p> <p>13. Safe use of tools and equipment used in the trade.</p>	
		<p>Carpenter works:-</p> <p>14. Demonstrate uses of Carpenter's hand tools.</p> <p>15. Centering work. Uses of nails, screws, nuts &amp; bolts, hinges etc.</p> <p>16. Perform centering &amp; form work.</p>	<ul style="list-style-type: none"> <li>● Common types of wood- their description and use.</li> <li>● Carpenter's hand tools, their names and uses.</li> <li>● Carpentry joints and their uses. Use of nails, screws, dowels, etc.</li> </ul>
<p>Professional Skill 145 Hrs.;</p> <p>Professional Knowledge 35 Hrs.</p>	<p>2. Plan and organize the work to make masonry brick wall and block work as per drawing and specification applying different types of tools, materials and check for dimensional accuracy.</p>	<p>17. Handling of brick/ block, turning of brick/ block for stretcher &amp; header faces.</p> <p>18. Cutting of brick with brick hammer as desire shape &amp; size.</p> <p>19. Cutting of blocks with cutter.</p> <p>20. Shaping mortar/ adhesive, spreading on the bed joining bricks and block.</p> <p>21. Preparation of various types of mortars according to the ratio of ingredients.</p> <p>22. Building <math>4\frac{1}{2}</math>" straight wall about 6courses high with one end stepped and the other racked back.</p> <p>23. Building <math>4\frac{1}{2}</math>" quoin wall with oneend stepped and the other racked back. Use of plumb rule.</p> <p>24. Construct of 1 &amp; 1 ½ brick wall junctions in English &amp; Flemish bonds. Racking</p>	<ul style="list-style-type: none"> <li>● Types of bricks and class of bricks.</li> <li>● Technical terms used in brick masonry. Necessity of bonding bricks. Types of bond Types of mortars, different grades of sand for brick work &amp; plastering. Grades of cement.</li> <li>● Brickwork-racking back &amp; toothing. Differences between English &amp; Flemish bonds. Details of English &amp; Flemish bond for 1 and <math>1\frac{1}{2}</math> brick walls. Precautions at quoins.</li> <li>● Cross wall-method of construction. Grouting of mortar, jointing and finishing of brickwork. Types of pointing &amp; tools used. Details of bonding &amp; special precautions at 'T', 'L' and cross junctions. Types of copings- weathering &amp; throating.</li> </ul>

		<p>out the joints &amp; finishing it flush.</p> <p>25. Construction of 1 brick thick walls in English &amp; Flemish Garden bonds.</p> <p>26. Construct of detached brick pillars with footings square &amp; rectangular types.</p> <p>27. Construct one block wall of 6X4 block length L shape.</p>	<ul style="list-style-type: none"> <li>● Pillars: Necessity, types, relation between cross section &amp; height. Details of reinforcement for square &amp; rectangular pillars.</li> <li>● Types of cement, sand &amp; lime. English &amp; Flemish Garden wall bonds. PWD specification on brickwork.</li> <li>● Foundation: Definition, purpose, types, important terms, causes of failure of foundations.</li> </ul>
<p>Professional Skill 25 Hrs.;</p> <p>Professional Knowledge 05 Hrs.</p>	<p>3. Construct wall leaving space for door &amp; window opening.</p>	<p>28. Form a door opening in a wall of English bond. Bonding of jambs &amp; reveals.</p> <p>29. Perform level marking of different mason work.</p> <p>30. Form a window opening in a wall in English bond.</p> <p>31. Construction of sill with over sailing courses.</p> <p>32. Use of gauge rod Fixing door &amp; window frames.</p>	<ul style="list-style-type: none"> <li>● Purpose of arch centering &amp; form work. Different types of bricks &amp; their sizes. Characteristics of good bricks Sizes of mortar joints for different works. Stretcher &amp; header</li> </ul>
<p>Professional Skill 52 Hrs.;</p> <p>Professional Knowledge 08 Hrs.</p>	<p>4. Perform R.C.C casting, rod cutting in different sizes, bending, binding &amp; placing. Mixing &amp; compaction of Concrete with different proportions.</p>	<p>33. Demonstrate R.C.C, re-enforcement of different dia. with unit weight. Cutting, bending &amp; binding of bar.</p> <p>34. Perform Pre-casting a lintel-compacting, curing &amp; setting the same in position. Check for equal bearing.</p> <p>35. Spanning of opening by casting a lintel in site.</p> <p>36. Making of shuttering &amp; supports with uprights and wedges.</p> <p>37. Cutting, bending &amp; placing of reinforcement.</p>	<ul style="list-style-type: none"> <li>● RCC lintels: Materials required, method of construction, precast lintels, method of construction of formwork, details of reinforcement.</li> <li>● Concept of bar bending schedule.</li> <li>● Curing process and curing time.</li> <li>● Arches: Purpose, technical terms &amp; types. Setting out an arch.</li> </ul>

		<p>38. Mixing, placing &amp; compacting concrete.</p> <p>39. Spanning of opening with a semi-circular arch, making centering, cutting of templates for voussoirs &amp; preparing voussoirs, setting uprights of arch.</p> <p>40. Construction of arch &amp; removing centering.</p>	
<p>Professional Skill 25 Hrs.;</p> <p>Professional Knowledge 05 Hrs.</p>	<p>5. Perform Construction of cavity wall.</p>	<p>41. Construct cavity walls, setting out both leaves, provision of wall ties and use of cavity rods.</p>	<ul style="list-style-type: none"> <li>● Cavity wall: Technical terms, advantages, constructional details, precautions to be taken at the bottom of cavity.</li> </ul>
<p>Professional Skill 52 Hrs.;</p> <p>Professional Knowledge 08 Hrs.</p>	<p>6. Perform Laying out of building plan, diagonal check-up, fixing up of excavation lines.</p>	<p>42. Setting out a building: Obtaining first, second, third &amp; fourth lines, marking diagonals, setting out cross walls &amp; offsets.</p> <p>43. Marking excavation lines &amp; fixing of plinth &amp; floor levels.</p>	<ul style="list-style-type: none"> <li>● Steps in setting out &amp; marking centre line, excavation line &amp; other lines-use of dead man-checking accuracy &amp; precautions. Windows &amp; ventilators: Including steel windows &amp; ventilators, fixtures &amp; fastenings used.</li> </ul>
<p>Professional Skill 65 Hrs.;</p> <p>Professional Knowledge 10 Hrs.</p>	<p>7. Perform wall &amp; ceiling plastering with application of mortar, smoothening the surface by using of screeds &amp; floats.</p>	<p>Perform plaster dots.</p> <p>44. Plastering of walls-setting of spots-applying mortar-use of screeds &amp; floats.</p> <p>45. Fixing of screeds to soffits of door &amp; window openings-reversing the screeds &amp; squaring.</p> <p>46. Plastering of ceiling: Application of mortar, strengthening and finishing (Improvise a roof with stone or concrete slab for the purpose of demonstration).</p>	<ul style="list-style-type: none"> <li>● Plastering: Tools used, necessity of screeds &amp; their fixing,</li> <li>● Steps in plastering.</li> <li>● Concrete: Ingredients, selection of materials, various ratios of mix, their uses, measuring of materials for mixing.</li> </ul>

		<p>47. Perform plastering by using auto plastering machine.</p> <p>48. Perform finishing of plaster surface by using rendering machine.</p>	
<p>Professional Skill 52 Hrs.;</p> <p>Professional Knowledge 08 Hrs.</p>	<p>8. Make different types of floor with determination and formation of Slope.</p>	<p>49. Perform floor dots for levelling</p> <p>50. Flooring practice: Determination and formation of slope, application of slurry for finishing, setting out of skirting, formation of spots for skirting.</p> <p>51. Use of screeds, formation of curve at the junction of skirting &amp; floor.</p>	<ul style="list-style-type: none"> <li>Floors: Types, constructional details such as consolidation of bed, sand filling, concrete base &amp; finishing. Granolithic flooring. Local Municipal byelaws.</li> </ul>
<p>Professional Skill 89 Hrs.;</p> <p>Professional Knowledge 31 Hrs.</p>	<p>9. Lay drain pipe, jointing, fittings &amp; fixing of W.C. pan, urinals, gully trap. Construction of manhole etc.</p>	<p>52. Drainage: Set out a drainage line including position of manhole &amp; gully trap.</p> <p>53. Practice in setting up and reading of Auto level.</p> <p>54. Lay out drainage to required gradients with the help of Auto level and/or boning rod and laying its surface with bricks.</p> <p>55. Laying of concrete foundation for drainage pipes and jointing. Checking of alignment. Cutting the pipe to the required length.</p> <p>56. Covering of drain pipe with concrete as per PWD specification.</p> <p>57. Laying out foundation concrete and construction of manhole.</p> <p>58. Method of providing footrests,</p>	<ul style="list-style-type: none"> <li>Concept of levelling by using auto level.</li> <li>Purpose of drainage, different systems, their advantages &amp; disadvantages, method of collection, carriage &amp; final disposal of wastage, various types of constructions required.</li> <li>Roofs: Classification, parts, trussed roof, covering materials.</li> <li>House drainage system-normal layout of drainage.</li> <li>Traps-gully, nahani, etc.-their description.</li> <li>Purpose &amp; method of fixing sanitary fittings such as WC, urinal, washbasin, kitchen sink, etc.</li> <li>Construction of surface drains and laying its surface with bricks.</li> <li>Drainage pipes: Types, materials, sizes, gradient</li> </ul>

		Forming of drain and benching.	for different diameters, method of laying & jointing, importance of water tightness, concrete base and covering.
Professional Skill 50 Hrs.; Professional Knowledge 10 Hrs.	10. Construct septic tank. Perform fixing & fittings of wash basin, flushing cistern, sink, vent pipe, etc.	59. Construct Septic tank conforming PWD norms, Bonding & waterproofing of tank walls, lining field drains with bricks. 60. Shoring for deep trenches following proper Safety precautions. 61. Fix brackets for washbasin and flushing cistern. 62. Fix WC pan, kitchen & bathroom traps, sinks, etc. Fixing of vent pipe to walls.	<ul style="list-style-type: none"> <li>● Septic tank: Purpose, parts and method of construction.</li> </ul>
Professional Skill 25 Hrs.; Professional Knowledge 05 Hrs.	11. Lay marble on floor & stair with marking, cutting & complete setting.	63. Perform level marking. 64. Marble work: Method of cutting and setting on stair, floor, wall & pillar.	<ul style="list-style-type: none"> <li>● Marble floor: types, constructional details.</li> </ul>
Professional Skill 25 Hrs.; Professional Knowledge 05 Hrs.	12. Construct circular brick wall & hollow block walls.	65. Construct a 4 ½" dia. X 9" thick circular brick wall 4 layers. 66. Construct circular gate pillars with Brick / stone / tile / concrete.	<ul style="list-style-type: none"> <li>● Circular walls: Details of construction. Purpose-made bricks.</li> <li>● Setting out and construction of circular gate pillars with brick/stone/tile/concrete.</li> <li>● Hollow block masonry: Laying of hollow blocks for walls &amp; columns.</li> <li>● Use of structural clay tile for partition.</li> <li>● Precast concrete partition, metal lathe partition and concrete block partition.</li> </ul>

<p>Professional Skill 62 Hrs.;</p> <p>Professional Knowledge 13 Hrs.</p>	<p>13. Prepare &amp; mix of concrete, formwork, cutting &amp; bending of bar, casting of roof slab, beams, lintels, stair, column etc.</p>	<p>67. Casting of roof slab/ beams/ lintels/ stair/ column with RCC</p> <p>68. Perform slump test process.</p> <p>69. Perform concrete vibrating process.</p>	<ul style="list-style-type: none"> <li>● Introduction to RCC: Uses, materials, properties and formwork, bending of bars &amp; construction.</li> <li>● Reference to ISI code. Reinforced brickwork.</li> <li>● Brief description of slabs, beams, lintels, stairs, columns, etc.</li> <li>● RCC work: Mixing of concrete.</li> <li>● Types of pouring</li> <li>● Concept of slump test process.</li> <li>● Concept of Ready Mix Concrete (RMC)</li> <li>● Concept of concrete vibrating process</li> <li>● Curing of concrete.</li> <li>● Thumb rule for percentage of reinforcement for lintels, slabs, beams &amp; columns.</li> <li>● Necessity hook &amp; cranking. Shear reinforcement.</li> </ul>
<p>Professional Skill 25 Hrs.;</p> <p>Professional Knowledge 05 Hrs.</p>	<p>14. Cut &amp; set glazed tiles to walls.</p>	<p><b>Finishing works:</b></p> <p>70. External/internal wall finishing practice by plastering or pointing.</p> <p>71. Fixing cement concrete jelly.</p> <p>72. Laying of glazed tiles.</p> <p>73. Fixing the thread, filling between ends, plumbing, setting out a jamb, bonding.</p> <p>74. Marking &amp; cutting tiles.</p>	<ul style="list-style-type: none"> <li>● Mortar ratio of plaster.</li> <li>● Method of finishing-factors to be kept in mind, PWD specification on the above.</li> <li>● Use of glazed tiles for wall facing, steps in fixing, precautions.</li> <li>● Construction &amp; expansion joints-method of filling-repair of cracks.</li> </ul>
<p>Professional Skill 50 Hrs.;</p> <p>Professional Knowledge 10 Hrs.</p>	<p>15. Lay mosaic, terrazzo &amp; tile flooring. Perform Construction of R.C.C. &amp; Brick stairs.</p>	<p>75. Perform level marking</p> <p>76. Flooring: Mosaic, terrazzo, and tile flooring.</p> <p>77. Laying out a stair on the ground.</p>	<ul style="list-style-type: none"> <li>● Stairs: Technical terms, relation between tread &amp; rise,</li> <li>● Types of stairs, construction details of brick, stone &amp; RCC stairs.</li> </ul>

			<ul style="list-style-type: none"> <li>● Spiral stairs with precast concrete steps.</li> <li>● Formwork &amp; shuttering-their removal-precautions-PWD specifications.</li> </ul>
Professional Skill 22 Hrs.; Professional Knowledge 08 Hrs.	16. Perform scaffolding work	78. Perform scaffolding work	<ul style="list-style-type: none"> <li>● Concept of scaffolding</li> <li>● Different types of scaffolding material</li> <li>● Hazard related to scaffolding work</li> </ul>
<b>ENGINEERING DRAWING</b>			
Professional Knowledge ED- 30 Hrs.	17. Read and apply engineering drawing for different application in the field of work.	<p>Introduction to Engineering Drawing and Drawing Instruments –</p> <ul style="list-style-type: none"> <li>● Conventions</li> <li>● Sizes and layout of drawing sheets</li> <li>● Title Block, its position and content</li> <li>● Drawing Instrument</li> </ul> <p>Free hand drawing of –</p> <ul style="list-style-type: none"> <li>● Geometrical figures and blocks with dimension</li> <li>● Transferring measurement from the given object to the sketches.</li> <li>● Free hand drawing of hand tools and measuring tools.</li> </ul> <p>Drawing of Geometrical figures:</p> <ul style="list-style-type: none"> <li>● Angle, Triangle, Circle, Rectangle, Square, Parallelogram.</li> <li>● Reading of dimension and Dimensioning Practice.</li> </ul> <p>Symbolic representation –</p> <ul style="list-style-type: none"> <li>● Different symbols used in the trades.</li> </ul> <p>Reading of Plan drawing</p>	
<b>WORKSHOP CALCULATION SCIENCE</b>			
Professional Knowledge WCS- 30 Hrs.	18. Demonstrate basic mathematical concept and principles to perform practical operations. Understand and explain basic science in the field of study.	<p><b>Unit, Fractions</b></p> <p>Classification of unit system Fundamental and Derived units F.P.S, C.G.S, M.K.S and SI units Measurement units and conversion Factors, HCF, LCM and problems Fractions - Addition, subtraction, multiplication &amp; division Decimal fractions - Addition, subtraction, multiplication &amp; division Solving problems by using calculator</p> <p><b>Square root, Ratio and Proportions, Percentage</b></p> <p>Square and square root Simple problems using calculator Applications of Pythagoras theorem and related problems Ratio and proportion</p>	

		<p>Ratio and proportion - Direct and indirect proportions          Percentage          Percentage - Changing percentage to decimal and fraction  <b>Mass, Weight, Volume and Density</b>          Mass, volume, density, weight and specific gravity          Related problems for mass, volume, density, weight and specific gravity  <b>Mensuration</b>          Area and perimeter of square, rectangle and parallelogram          Area and perimeter of Triangles          Area and perimeter of circle, semi-circle, circular ring, sector of circle, hexagon and ellipse          Surface area and volume of solids - cube, cuboid, cylinder, sphere and hollow cylinder          Finding the lateral surface area, total surface area and capacity in liters of hexagonal, conical and cylindrical shaped vessels  <b>Trigonometry</b>          Measurement of angles          Trigonometrical ratios  <b>Productivity Calculation</b></p>
<p><b><u>In plant training/ Project work</u></b>  <b>Broad areas:</b></p> <ol style="list-style-type: none"> <li>a) Install a W.C. pan.</li> <li>b) Construct of a circular brick wall</li> <li>c) Construct a manhole.</li> <li>d) Set glazed tiles on wall.</li> <li>e) Set tac tile for differently abled.</li> <li>f) Layout of 2BHK house.</li> <li>g) Plastering of 10X10 feet wall including plaster dots.</li> </ol>		

<b>SYLLABUS FOR CORE SKILLS</b>
1. Employability Skills (Common for all CTS trades) (120 Hrs.)

Learning outcomes, assessment criteria, syllabus and Tool List of Employability Skills is provided separately in [www.cstaricalcutta.gov.in](http://www.cstaricalcutta.gov.in) / [www.bharatskills.gov.in](http://www.bharatskills.gov.in) / [www.dgt.gov.in](http://www.dgt.gov.in).

<b>List of Tools and Equipment</b>			
<b>MASON (Building Constructor) (For batch of 24 Candidates)</b>			
<b>S No.</b>	<b>Name of the Tools&amp; Equipment</b>	<b>Specification</b>	<b>Quantity</b>
<b>A. TRAINEES TOOL KIT</b>			
1.	Bolster	4" (100mm)	24+1 Nos.
2.	Pitching tool (mason)		24+1 Nos.
3.	Chisel (mason) Hammer headed punch		24+1 Nos.
4.	-do-	1/2" (12mm)	24+1 Nos.
5.	-do-	1" (25mm)	24+1 Nos.
6.	-do-	Cross cut type	24+1 Nos.
7.	-do-	¾" (18mm)	24+1 Nos.
8.	-do-	1½" (35mm)	24+1 Nos.
9.	Club hammer	1½" / 1pbs.	24+1 Nos.
10.	Measuring tape	5m	24+1 Nos.
11.	Hammer (mason) brick	(600-800gm)	24+1 Nos.
12.	Helmet		24+1 Nos.
13.	Safety Shoe		24+1 Nos.
14.	Safety Jackets		24+1 Nos.
15.	Rubber gloves		24+1 Nos.
16.	Goggles		24+1 Nos.
17.	Plumb level	36" (1m)	24+1 Nos.
18.	Pins (Line)		24+1 Nos.
19.	Plumb bob		24+1 Nos.
20.	Steel square		24+1 Nos.
21.	Mason trowel		24+1 Nos.
22.	Wooden float		12 nos.
23.	Tasla (tin) pan		24+1 Nos.
24.	Aluminum straight edge	4'	24+1 Nos.
25.	Bucket		24+1 Nos.
<b>B. TOOLS, MEASURING INSTRUMENTS AND GENERAL SHOP OUTFIT</b>			
26.	Spade with wooden handle		12Nos.
27.	Leather gloves		12 Nos.
28.	Safety belt		12 Nos.
29.	Pointing trowel		6 Nos.
30.	Shovel with wooden handle		6 Nos.
31.	Measuring steel tape	15m	3Nos.
32.	Measuring tape	50m	2Nos.
33.	Ladder	2-4m	01 No.

34.	Sledge hammer	4kg	01 No.
35.	Drum	45gallons	3Nos.
36.	G.I. pipe	1" (25mm) dia.	200Nos.
37.	Hose pipe		60m
38.	G.I. pipe	½" (12mm) dia.	200Nos.
39.	Cellotax board		3Nos.
40.	Spirit level	6" (15cm)	24 Nos.
41.	Chop saw machine	200 watt	2 sets
42.	Chop saw blade		As required
43.	Automatic Rendering machine		01 no.
44.	Spirit level	12" (30cm)	6 Nos.
45.	Screw driver (Set)		02 nos.
46.	Pickaxe		3 Nos.
47.	Crowbar	1.5m long	3Nos.
48.	Scraper		24 Nos.
49.	Snip straight	10" (25cm)	6 Nos.
50.	Carpenter tool kit of 20 sets		
	(a) Handsaw		1No.
	(b) Mortise chisel		1No.
	(c) Tenion saw		1No.
	(d) Firmer chisel		1No.
	(e) Mallet		1No.
	(f) Carpenter claw hammer		1No.
	(g) Hand brace with bits		1No.
	(h) Plane		1No.
51.	Wheel barrow (trolley type)		5Nos.
52.	Tubular scaffolding		As required
53.	Steel measuring boxes	(0.6 cft& 1.2 cft)	4 each
54.	Adjustable steel props		30Nos.
55.	Bending rods		3Nos.
56.	Bar bending die	one end 6mm and other 8mm	6 Nos.
57.	Bar bending die	one end 10mm and other 12mm	6 Nos.
58.	Auto level with stand & staff		3Nos.
59.	Spanner set		1No.
60.	Rammer		6 Nos.
61.	Steel shuttering	200sq. m.	2 sets
62.	Bench grinder		2Nos.
63.	Drilling machine		2Nos.
64.	Steel lockers	with 8 drawers Metal rack (1800x1500x450mm)	3 Nos.



65.	Metal rack	1800X1500X450mm	1 No.
66.	Desk		1No.
67.	Stool		1 No.
68.	Black Board with glass		1 No.
69.	Fire Extinguisher		1 No.
70.	Fire Buckets with stand		1 No.
71.	Steel Almirah (large)		1 No.
72.	Instructor table and chair		1 No.
<b>C. TOOLS &amp; EQUIPMENT FOR DRAWING HALL</b>			
73.	Engineering Instrument Box		24+1 Nos.
74.	Protractor	15 cm full circular	24+1 Nos.
75.	Card board/ plastic metric scale set	A to H	24+1 Nos.
76.	Celluloid set square	45° & 60°	24+1 Nos.
77.	Drawing board	1250 x 900 mm	24+1 Nos.
78.	T square	1250 mm/ Mini drafter	24+1 Nos.
79.	Erasing shield small size		24+1 Nos.
80.	Architect's & builder's template		24+1 Nos.
81.	Drawing machine	Horizontal type	24+1 Nos.
82.	French curve- set of 12		24+1 Nos.
<b>Note:</b>			
1. Internet facility is desired to be provided in the class room.			
2. Dumpy level need not be provided, if the institute has Surveyor/Draughtsman Civil trade.			
3. Sl. Nos. 25 to 34 need not be provided, if the institute has Surveyor/ Architecture/ Draughtsman Civil/ Draughtsman Mechanical/ other similar trades.			

The DGT sincerely acknowledges contributions of the Industries, State Directorates, Trade Experts, Domain Experts, trainers of ITIs, NSTIs, faculties from universities and all others who contributed in revising the curriculum.

Special acknowledgement is extended by DGT to the following expert members who had contributed immensely in this curriculum.

<b>List of Contributors</b>			
<b>Sl. No.</b>	<b>Name &amp; Designation Mr./Ms.</b>	<b>Organization</b>	<b>Remarks</b>
1.	Sunil Kumar Gupta, DDG (ER)	CSTARI, Kolkata	Chairman
2.	T. Ragulan, Director	CSTARI, Kolkata	Member
3.	Brindaban Das, DD/HoO	CSTARI, Kolkata	Member
4.	Bikash Bag, Instructor	Govt. ITI, Gariahat	Member
5.	Kshetramohan Ghosh, Instructor	Govt. ITI, Howrah Homes	Member
6.	Amrita Gopal Gantait, Instructor	Govt. ITI, Howrah Homes	Member
7.	Abhisek Sinha, CEO	New Age Engineering, Kolkata	Member
8.	Tamal Ganguly, Head (Skill Dev.)	New Age Engineering, Kolkata	Member
9.	Sujit Chatterjee, Training Partner	New Age Engineering, Kolkata	Member
10.	Avijeet Mahara, Principal	Govt. ITI, Siuri, WB	Member
11.	Narayan Chakraborty	CPwD, Kolkata	Member
12.	Debasis Dhar	CPwD, Kolkata	Member
13.	Dharamvir Mishra, Contractor	CPwD, Kolkata	Member
14.	Baddhishwar Neiyer, Mason	CPwD, Kolkata	Member
15.	Swapan Dhali	CPwD, Kolkata	Member
16.	Subhendu Chakraborty, Asst. Manager	The BBI Construction Co. Ltd.	Member
17.	Partha Nandy, Chief Manager (Project)	The BBI Construction Co. Ltd.	Member
18.	Danish Anwar, Manager	Jaquar & Co. Pvt. Ltd.	Member
19.	Rakesh Rai, Proprietor	Nexus Technologies, (CPwD Contractor)	Member
20.	Bipul Goswami, Engineer	United Engineers of India, (CPwD Contractor)	Member
21.	Nivesh Singh, ASI	Jaquar & Co. Pvt. Ltd.	Member
22.	Swarup Saha, Contractor	CPwD, Kolkata	Member
23.	Malay Kumar Sarkar, Civil Engineer	Sodepur, Kolkata	Member

24.	Md Hossain Khan, Plumbing	Suri, Birbhum	Member
25.	Ali Ahamad Khan	CPwD, Kolkata	Member
26.	Sandip Das	CPwD, Kolkata	Member
27.	Ramesh Bhattacharya, Proprietor	Madhumita Construction, (CPwD Contractor)	Member
28.	Sujit Paul, Proprietor	M/s Paulcon	Member
29.	Priyabrata Ray	Mohima Enterprise, (CPwD Contractor)	Member
30.	Manish Kumar, Engineer	DBL Ltd. Co., Jharkhand	Member
31.	Sandeep Kumar, Engineer	SIEMENS, Durgapur	Member
32.	Biplab Dutta, AE (P)	CPwD, Kolkata	Member
33.	Shyamal Roy, AE-IV	CPwD, Kolkata	Member
34.	Archana Singh, ADT	CSTARI, Kolkata	Member
35.	Akhilesh Pandey, A.D.	CSTARI, Kolkata	Member
36.	Sk. Altaf Hossain, A.D.	CSTARI, Kolkata	Member
37.	Murari Barui, A.D.	CSTARI, Kolkata	Member
38.	B. K. Nigam, T.O.	CSTARI, Kolkata	Member
39.	P.K BAIRAGI, T.O.	CSTARI, KOLKATA	Member
40.	Hemant Kujur Jr. D/Man	CSTARI, Kolkata	Member
41.	Narayan Chandra Behera, ATO	State Institute of Plumbing Technology (SIPT), Govt ITI Pattamundai	Member
42.	Rajarethinam G, Vocational Instructor	Govt. ITI (men), Karaikal	Member
43.	Badal Hembram, ATO	State Institute of Plumbing Technology (SIPT), Govt ITI Pattamundai	Member
44.	Mahendar Rao, Director of Photography	Aaft University, Noida	Member
45.	Snehasish Bandyopadhyay, Assistant Director	DGT, MSDE	Member
46.	Praveen Kumar. V, JTO	Department of Employment & Training, Govt ITI - Ambattur	Member
47.	Dr Narender Singh, Centre Head	Pidilite Centre for Advance Skills Pidilite Industries Ltd., Ahmedabad	Member
48.	Chetan Singh Solanki, Senior Officer Training and Development	Pidilite Centre for Advance Skills Pidilite Industries Ltd., Ahmedabad	Member

---

---

<b>ABBREVIATIONS</b>	
CTS	Craftsmen Training Scheme
ATS	Apprenticeship Training Scheme
CITS	Crafts Instructor Training Scheme
DGT	Directorate General of Training
MSDE	Ministry of Skill Development and Entrepreneurship
NTC	National Trade Certificate
NAC	National Apprenticeship Certificate
NCIC	National Craft Instructor Certificate
LD	Locomotor Disability
CP	Cerebral Palsy
MD	Multiple Disabilities
LV	Low Vision
HH	Hard of Hearing
ID	Intellectual Disabilities
LC	Leprosy Cured
SLD	Specific Learning Disabilities
DW	Dwarfism
MI	Mental Illness
AA	Acid Attack
PwD	Person with disabilities

