CURRICULUM

FOR THE TRADE OF

Formwork

UNDER

APPRENTICESHIP TRAINING SCHEME

GOVERNMENT OF INDIA

MINISTRY OF SKILL DEVELOPMENT AND ENTREPRENEURSHIP

DIRECTORATE GENERAL OF TRAINING

1. Category of trade **:** Non-Engineering

2. Name of the Trade **:**Formwork

3. Duration of Apprenticeship Training **:** **24 Months**

Break up of the Apprenticeship Training

(i) Duration of Basic Training **:** 6 (3+3) months / 1200 Hrs

(ii) Duration of Practical Training/ On-the-job Training: 18 (9+9) Months

4. Entry Qualification **:** 5th Pass

(A) <u>Basic training components</u>

(i) Employability Skills – 110 Hrs

(ii) Basic numeracy - 50 Hrs

(iii) Trade theory - 120+120 Hrs

(iv) Trade practical - 400+400 Hrs

(B**Practical Training/On-the job training** **:** 18 Months

CONTENTS

1. ACKNOWLEDGEMENT

L&T Construction Corporate Centre, HQ, sincerely acknowledges with thanks the contribution and cooperation extended by the Construction Skills Training Institutes and project sites of L&T projects, Trade Experts, Subject Matter Experts and all others to bring out this curriculum for the trade of **Formwork (under structural framework building)** under Apprenticeship Training Scheme.

Special acknowledgement to the following departments in L&T Construction who have contributed valuable inputs in bringing out this curricula through their expert members:

1. Competency Development Centre
2. Skills training institutes Facilities & Management Team
3. Principals and Master Trainers
4. Subject Matter Experts from respective department
5. VACUM (Vocational Curriculum) Development team of L&T Construction Skills Training Department

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**; tradeapprentice, 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.

3. RATIONALE

[Need for Apprenticeship asConstructionworks]

In a construction industry, the identification and selection of most important construction trades, which covers almost 80% of the construction work activities. These trades cover Bar bending, Masonry, Formwork, Plumbing, Finishing-Tiling, Lab Technician, Surveyor, Electrician, Welding, CCTV, Optical Fibre Cable (OFC) and all sectorial activities. It will covers the Construction, Installation & Surveillance and Infrastructure industries.

The greater degree of relevance of the training with latest advancements of the industry will enhance the employability opportunities.

1. Identify, select and use shuttering carpentry basic hand tools and small equipments.
2. Identify, select and use materials, components, and consumables.
3. Use personnel protective safety equipments.
4. Dispose waste / debris and perform good housekeeping.
5. Measure, mark, cut to given size and drill holes in timber and Plywood
6. Measure, mark, cut to given size, plane and make & fit basic joints in timber scantlings.
7. Make to given size conventional straight shutters.
8. Identify, select and use the system shuttering carpentry hand tools and small equipments.
9. Identify, select and use the materials, components, and consumables.
10. Use personnel protective safety equipments
11. Dispose waste / debris and perform good housekeeping
12. Handle, Erect, and Dismantle System Formwork - Foundation form.
13. Handle, Erect, and Dismantle System Formwork – Column form
14. Handle, Erect, and Dismantle System Formwork – Wall form
15. Handle, Erect, and Dismantle System Formwork - Beam form
16. Handle, Erect, and Dismantle System Formwork – Beam & Slab form

17. Identify, select and use the system scaffolder hand tools and small equipments.
18. Identify, select and use the materials, components, and consumables.
19. Use personnel protective safety equipments
20. Dispose waste / debris and perform good housekeeping
21. Handle, Erect and Dismantle System FW-Staging
22. Handle. Erect and Dismantle System FW – Stair Tower
23. Handle, Erect and Dismantle System FW – Access Scaffold form

4. JOB ROLE

Brief description of Job role:

FormworkTradeis one of the basic trades in Construction Industry which is common to all type of Constructions and has variance with respect to specificrequirements of the Project.

Brief Job Description of Formwork: Formwork carpenter is expected to make, assemble, erect and dismantle convention / system formwork for all type of cast in-situ and pre-cast RCC work, erect and dismantle all types of scaffolding, readingdrawings, setting and layout. He should ensure trade specific compliance ofenvironment, health, safety aspects and should engage and supervise the HelperShuttering Carpenter under him for all relevant tasks.

5. LEARNING OUTCOMES

A. GENERIC OUTCOME

- Recognize & comply safe working practices, environment regulation and housekeeping.
- Work in a team, understand and practice soft skills, technical English to communicate with required clarity.
- Understand and explain the concept in quality tools and labour welfare legislation and apply such in day to day work to improve productivity & quality.
- Explain energy conservation, global warming and pollution and contribute in day to day work by optimally using available resources.
- Explain personnel finance, entrepreneurship and manage/organize related task in day to day work for personal & societal growth.
- Understand and apply basic computer working, basic operating system and uses internet services to get accustomed & take benefit of IT developments in the industry.

B. SPECIFIC OUTCOME

The Trainees will be able to

- Identify, select and use shuttering carpentry basic hand tools and small equipments.
- Identify, select and use materials, components, and consumables.
- Use personnel protective safety equipments
- Dispose waste / debris and perform good housekeeping.
- Measure, mark, cut to given size and drill holes in timber and Plywood
- Measure, mark, cut to given size, plane and make & fit basic joints in timber scantlings.
- Make to given size conventional straight shutters.
- Identify, select and use the system shuttering carpentry hand tools and small equipments.
- Identify, select and use the materials, components, and consumables.
- Use personnel protective safety equipments

- Dispose waste / debris and perform good housekeeping
- Handle, Erect, and Dismantle System Formwork - Foundation form.
- Handle, Erect, and Dismantle System Formwork – Column form
- Handle, Erect, and Dismantle System Formwork – Wall form
- Handle, Erect, and Dismantle System Formwork - Beam form
- Handle, Erect, and Dismantle System Formwork – Beam & Slab form
- Identify, select and use the system scaffolder hand tools and small equipment's.
- Identify, select and use the materials, components, and consumables.
- Use personnel protective safety equipment's
- Dispose waste / debris and perform good housekeeping
- Handle, Erect and Dismantle System FW-Staging
- Handle. Erect and Dismantle System FW – Stair Tower
- Handle, Erect and Dismantle System FW – Access Scaffold form
- Identify, Handle, stack, and store System Form work Components.
- Handle System straight shutters and Assist in erection and dismantling for - Foundation, Column, Wall, Beam & Slab
- Identify components, assemble, erect & dismantle different types of scaffolding.
- Assemble, erect and dismantle different types of walkways and platforms. .

6. GENERAL INFORMATION

1.	Name of the Trade	:	Formwork
2.	Duration of Apprenticeship Training	:	24 Months
	Basic Training	:	6 Months
	Practical Training	:	18 Months
3.	Duration of Basic Training	:	
	a. Block –I	:	3 months
	b. Block - II	:	3 months
4.	Total duration of Basic Training	:	6 Months
5.	Duration of Practical Training (On -job Training)	:	18 Months
6.	Entry Qualification	:	5th Pass
7.	Selection of Apprentices	:	The apprentices will be selected asper Apprenticeship Act amended time to time.
8.	Rebate for ITI passed trainees	:	NA

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

7. COURSE STRUCTURE

Training duration details:-

Time (in months)	**1-3**	**4-12**	**13-15**	**16-24**
Controlled Condition training	Part A	-------	Part B	------
On-job training	-----	Part A	------	Part B

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
Controlled Condition Training Part A																								
On Job Training, Part A																								
Controlled Condition Training Part B (@ site)																								
On Job Training, Part B																								

8. SYLLABUS

8.1 BASIC TRAINING

(Part A & B)

DURATION: 06 MONTHS

GENERAL INFORMATION

1)	Name of the Trade	:	Formwork
2)	Hours of Instruction	:	800 Hrs.
3)	Batch size	:	20
4)	Power Norms	:	NA
5)	Space Norms	:	NA
6)	Examination	:	The internal assessment will be held on completion of each Block.
7)	Instructor Qualification	:	

a) Degree/Diploma in Engineering or Masters from recognized university/Board with one/two year post qualification experience respectively in the relevant field.

8)Tools, Equipment's & Machinery required: - As per Annexure – I

8.1.1 Details of Syllabus of Core Skill

COURSE CONTENTS:-

Introduction to Basic Competencies
• Introduction to Trade and duties of "Assistant Shuttering Carpenter and Scaffolder" • Occupational health hazards, Personal Protective Equipments(PPE) usage and working at heights • Introduction, Handling, Storing and Maintenance of Tools, Materials, Consumables and Small Equipments • Understanding tolerance limits, Measuring in MKS system, field testing of Materials and Consumables

Controlled Condition Training (Part A and Part B)

Duration: 6 Months (3 Month in each part)

Controlled Condition Training, Part A: 3 Months

PracticalCompetencies	**UnderpinningKnowledge(Theory)**
SizingofTimber Sizingarawtimberusingproper toolstomeasure,mark, cut anddrillholeswith inrequiredtolerancesandstandards	• Identification of timber according toclassification andquality • Identification,care&safeusageof tools • Readingsimple drawingsandsketches • Understanding of tolerance and housekeeping
Cuttingof Plywood Preparationofaplypieceoutofplywoodsheetusingpropertoolstomeasure,mark,cutanddrillholeswithinrequiredtolerancesand standards.	• Identification of Plywood according toclassification andquality • Identification,care&safeusageof tools • Readingsimple drawingsandsketches • Understandingoftolerance,housek eepingand maintenanceofplywood
TimberJointing Preparationofhalflap,dovetail,tenon&mortisejointswithshapedtimbersusingpropertoolstomeasure,mark,cutandfitwithin required tolerancesandstandards	• Identification,careandsafeusageoftimberjointingtools • Knowledgeofvariousjointsandappropriateapplications,theirrelativemeritsanddemerits. • Readingsimple drawingsandsketches • Understanding of tolerance and housekeeping

Restricted height scaffolding – uptoheightof 4.5m Erection &Dismantlingofaccessscaffoldforupto4.5musingbamboos/woodenpoles/steelpipes,ropes,couplers,woodenplanksetc	• Knowledge oferectinganddismantlingofdifferent typesofbamboos/woodenpoles /steel pipescaffolding • Typesofjointingpoles/pipes • Understandingpersonalsafety,workingatheights, storing,stackingscaffold materials • Readingsimple drawingsandsketches
Handling,ErectingandDismantlingSystemFW-Staging Giventhestagingmaterialsconsumablesandtools,erectstagingaspersketch/oralinstructionstotolerancesupto+or–25mmforaheightof10m.	• Knowledgeofstagingcomponents,tools,principles &sequenceofassembly &bracing,soleplates,supportingstrata,tolerancesinverticalityanddimension,heighttobaseratio,safetyforerection&dismantling,precautionsatheightsworkingplatforms,handrails;housek eeping.
Handling.ErectingandDismantlingSystemFW–Stair Tower Givenstairtowermaterialsandtools,erectstairtowerаspersketch/oralinstructionstotolerancesof +/- 25mmforaheightof10mwithplatforms,handrails,stairsandlandingcomplete	• Knowledgeofstairtowercomponents,tools,principles&sequenceofassembly&bracing,soleplates,supportingstrata,tolerancesinverticallyanddimension, bracinglevels,safetyforerection&dismantling,precautionsatheights,workingplatforms,handrails,housekeeping.
Handling,ErectingandDismantlingSystemFW–Access ScaffoldForm GiventheSystemcomponentsofscaffoldingmaterialsandtools,erectscaffoldingaspersketch /oralinstructionstotolerancesupto+/-25mmforaheightof10 mincludinglateralsupports,walkwayplatforms,handrailsandtoeboards.	• KnowledgeofSystemcomponents;knowledgeofmarkinglayout;techniquesofassembly,alignment,supporting,de-shuttering;pocketsembedment;tacklingformwork; housek eepingproblemsduringconcreteplacing;releaseagents;repetitionsofformwork;tolerancesinline,level anddimensions.

Controlled Condition Training, Part B: 3 Months

Handling,ErectingandDismantlingSystemFormwork-FoundationForm Giventhesystemshutters,consumablesandtools,assembleanddismantlefoundationformincludingpropsandtierodsfora foundationaspersketchtoa tolerance of-6mm/ +25mmoverall dimension, -2.5%ofheightandout-of-linenotmorethan1%offoundationwidthor 25mmwhicheverisless.	• KnowledgeofSystemcomponents;knowledgeofmarkinglayout;techniquesofassembly, alignment,supporting,de-shuttering;pocketsembedment;tacklingformwork;housek eepingproblemsduringconcreteplacing;releaseagents;repetitionsofformwork;tolerancesinline,level anddimensions.
Handling,ErectingandDismantlingSystemFormwork –ColumnForm Giventhecomponents,shutters,consumablesandtools,assembleanddismantlecolumnformincludingpropsandtierodsforacolumnaspersketchtoatolerancesof+/-3mmincrosssectionaldimensionsand+/-3mmforaheightof3mor+/-12mmoverentireheightwhicheverisless.	• KnowledgeofSystemcomponents;knowledgeofmarkinglayout;techniquesofassembly, alignment,supporting,de-shuttering;pocketsembedment;tacklingformwork;housek eepingproblemsduringconcreteplacing;releaseagents;repetitionsofformwork;tolerancesinline,level anddimensions.
Handling,ErectingandDismantlingSystemFW–WallForm Giventhecomponents,shutters,consumablesandtools,assembleanddismantlewallformincludingprosandtierodsforawallaspersketchwiththevariationinplumbnotexceeding3mmover6mheightor6mmoverentireheightwhicheverisless,variationinthicknessnotexceeding–3mm/+6mmand variationinlinearlinenot exceeding +/-12mm.	• KnowledgeofSystemcomponents;knowledgeofmarkinglayout;techniquesofassembly, alignment,supporting,de-shuttering;pocketsembedment;tacklingformwork;housek eepingproblemsduringconcreteplacing;releaseagents;repetitionsofformwork;tolerancesinline,level anddimensions.
Handling,ErectingandDismantlingSystemFW–BeamForm Giventhecomponents,shutters,consumableandtools,assembleanddismantlebeamformovertheerectedstagingincludingpropsandtierodsforabeamaspersketchwiththevariationinlevelnotexceeding3mmover3mlengthor10mmoverentirelengthwhicheverisless,variationincrosssectionaldimensionnotexceeding–3mm/+6mmandVariationinlinearlinenotexceeding+/-3mmin 3m.	• KnowledgeofSystemcomponents;knowledgeofmarkinglayout;techniquesofassembly, alignment,supporting,de-shuttering;pocketsembedment;tacklingformwork;housek eepingproblemsduringconcreteplacing;releaseagents;repetitionsofformwork;tolerancesinline,level anddimensions.

Handling,ErectingandDismantlingSystemFW– Beam/SlabForm Beam Giventhecomponents,shutters,consumablesandtools,assembleanddismantlebeamformovertheerectedstagingincludingpropsandtierodsforabeamaspersketchwiththevariationinlevelnotexceeding3mmover3mlengthor10mmoverentirelengthwhicheverisless,variationincrosssectionaldimensionnot exceeding–3mm /+6mm andvariationin linearline notexceeding+/- 3mmin3m.Slab Giventhecomponents,shutters,consumablesandtools,assembleanddismantleslabformincludingpropsforaslabasper sketchwiththevariationinlevelnotexceeding3mover3mlengthor10mmoverentirelengthwhicheverislessandvariationinlinearlinenotexceeding+/-12mm.	• KnowledgeofSystemcomponents;knowledgeofmarkinglayout;techniquesofassembly, alignment,supporting,de-shuttering;pocketsembedment;tacklingformwork;housek eepingproblemsduringconcreteplacing;releaseagents;repetitionsofformwork;tolerancesinline, level anddimensions.

8.1.2 EMPLOYABILITY SKILLS

GENERAL INFORMATION

1) **Name of the subject** : **EMPLOYABILITY SKILLS**

2) **Applicability** : ATS- Mandatory for fresher only

3) **Hours of Instruction** : 110 Hrs.

4) **Examination** : The examination will be held at the end of two years Training by CSDCI.

5) **Instructor Qualification** :

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

And

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

OR

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

8.1.3 SYLLABUS OF EMPLOYABILITY SKILLS

Part A

Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	**20**
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	
1	**Basics of Computer** Introduction, Computer and its applications, Hardware and peripherals, Switching on-Starting and shutting down of computer.	**20**
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	
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.	
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.	**15**
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.	
4	**Facing Interviews** Manners, Etiquettes, Dress code for an interview Do's & Don'ts for an interview	
5	**Behavioral Skills** Problem Solving Confidence Building Attitude	

Topic No.	Topic	Duration (in hours)
	Entrepreneurship skill	**15**
1	**Concept of Entrepreneurship** **Entrepreneurship** - Entrepreneurship - Enterprises:- Conceptual issue Entrepreneurship vs. Management, Entrepreneurial motivation. Performance & Record, Role & Function ofentrepreneurs 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	
1	**Productivity** Definition, Necessity, Meaning of GDP.	

2	**Affecting Factors** Skills, Working Aids, Automation, Environment, Motivation How improves or slows down.	**10**
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	**15**
1	**Safety & Health** Introduction to Occupational Safety and Health importance of safety and health at workplace.	
2	**Occupational Hazards** Basic Hazards, Chemical Hazards, Vibroacoustic 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	**05**
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	**10**
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	

8.2BASIC NUMERACY

GENERAL INFORMATION

6) **Name of the subject** : **BASIC NUMERACY**

7) **Applicability** : ATS- Mandatory for fresher only

8) **Hours of Instruction** : 50 Hrs.

9) **Examination** : The examination will be held at the end of two years Training by CSDCI.

10) **Instructor Qualification** :

iii) MBA/BBA with two years experience or graduate in Science and Mathematics with two years experience and trained in Basic Numeracy from DGET Institute.

And

Must have studied in Mathematics at 12^{th} /diploma level

8.2.1 SYLLABUS OF BASIC NUMERACY

Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	**50 Hrs**
1	Number System/Fractions	
2	Square Root/Cube Root	
3	Average/Percentage	
4	Area Calculation- Triangles, Quadrilaterals	
5	Concept of geometry- Square, Rectangle, Circle, Triangle	
6	Basic Trigonometry	

8.3 PRACTICAL TRAINING (ON-JOB TRAINING)

(Part A & B)

DURATION: 18 MONTHS

Broad Skill Components to be covered during On-Job Training

On Job Training, Part A: 9 Months

1) Sizing of Timber
2) Cutting of Plywood
3) Timber Jointing
4) Restricted height scaffolding – up to height of 4.5m
5) Handling, Erecting and Dismantling System FW- Staging
6) Handling. Erecting and Dismantling System FW –
7) Stair Tower
8) Handling, Erecting and Dismantling System FW –
9) Access Scaffold Form

On Job Training, Part B: 9 Months

1) Handling, Erecting and Dismantling System Formwork- Foundation Form
2) Handling, Erecting and Dismantling System Formwork – Column Form
3) Handling, Erecting and Dismantling System FW – Wall Form
4) Handling, Erecting and Dismantling System FW – Beam Form
5) Handling, Erecting and Dismantling System FW – Beam/Slab Form
6) Handling, Erecting and Dismantling System FW - Scaffolding

4.**Instructors Qualification:**

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

OR

ii) ITI in relevant trade with three year experience / 8 years' experience in the relevant field with 10^{th} Qualification.

5. Infrastructure for On-Job Training: Ongoing Project sites

9. ASSESSMENT STANDARD

Assessment Guideline

Successful achievement of the partical assesment is the professional judgement of the instructor/assessor. Failure to demonstrate the appropriate practical skills and practices to the satisfatction of the Assessor will result in a failure of the course. The following area will be consoidered.
Selection of materials, Understanding of drawing, Quality of work (Functional aspects, Dimensional features, Surface finish), Personal safety, time taken to complete the job.
If the delegate fail a couse the Training Provider must make a recommendation outline a time period required for the delegate to gain sufficient industry experinece prior to repete the course.

A sample assessment sheet is below

Assessment Sheet Formwork Trade					
Name		**Batch**	**Roll No**		**Allotted Time**
S.No	**Standards**		**Permitted Tolerance**	**Observed Variations**	**Assessment ✓ / ×**
1.	Verticality for every 10 M		± 25 mm		
2.	Date				
3.	Time of Commencement				
4.	Time of Completion				
5.	Time Taken				
6.	Overall Assessment (Pass / Fail)				
7.	Demonstrator	Name			
		Sign			
8.	Instructor	Name			
		Sign			

10. FURTHER LEARNING PATHWAYS

- On successful completion of the course trainees can opt for any charge hand/ foreman / supervisory course under CSDCI.

Employment opportunities:

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

1. Construction Sector – Structural activities.

ANNEXURE – I

TOOLS & EQUIPMENT FOR BASIC TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONALKNOWLEDGE

TRADE: Storage and Inventory Executive (warehouse/Manufacturing plant)

LIST OF TOOLS & EQUIPMENTS FOR 20 APPRENTICES

A : TRAINEES TOOL KIT:-

S. No.	Name of equipment and Tools	Unit	Quantity Required
	TOOLS		
1	Adjustable Spanner	No's	5
2	Iron Jack Plane	No's	10
3	Spirit Level 12"	No's	5
4	Oil Stone	No's	5
5	Screw Driver (Flat)	No's	5
6	Star Screw Driver	No's	5
7	Punch	No's	5
8	Round File 10"	No's	3
9	Half Round File 10"	No's	3
10	Flat File 7"	No's	3
11	Triangular File 4"	No's	5
12	Firmer Chisel 2"	No's	5
13	Firmer Chisel 1.5"	No's	10
14	Firmer Chisel 1"	No's	5
15	Firmer Chisel 0.75"	No's	5

16	Firmer Chisel 0.5"	No's	5
17	Mortise Chisel 0.25"	No's	20
18	Try Square 8"	No's	10
19	Leather Apron	No's	3
20	Claw hammer	No's	20
21	D.E.Spanner 10/11	No's	10
22	D.E.Spanner 14/15	No's	10
23	D.E.Spanner 18/19	No's	10
24	D.E.Spanner 21/23	No's	10
25	D.E.Spanner 20/22	No's	5
26	D.E.Spanner 24/27	No's	5
27	Ring Spanner 10/11	No's	5
28	Ring Spanner 14/15	No's	5
29	Ring Spanner 16/17	No's	5
30	Ring Spanner 18/19	No's	5
31	Ring Spanner 20/22	No's	5
32	Ring Spanner 21/23	No's	3
33	Ring Spanner 24/27	No's	3
34	Ring Spanner 30/32	No's	5
35	Poker	No's	5
36	Plumb bob	No's	10
37	Hand saw	No's	10
38	Tenon saw	No's	10
39	Tube level	RM	60

40	Nail Bar	No's	5
41	Tool Box	No's	5
42	Marking gauge	No's	10
43	Bench vice 10"	No's	3
44	Wooden mallet	No's	6
45	Ball pein hammer 2lb	No's	6
46	Cutting player	No's	6
47	Hacksaw frame with blade 12"	No's	10
48	Auger	No's	5
49	Measuring Tape 3M	No's	20
50	Nose Plier	No's	3
51	Painting Brush 4"	No's	5
52	Painting Brush 2"	No's	5
SAFETY GADGETS			
53	Cotton Hand Gloves	Pair	20
54	Safety helmet refill	No's	20
55	Safety Belt (Full Body Hurness)	No's	10
56	Safety Goggles	No's	20
57	Nose Mask	No's	20
58	Ear muff	No's	10
59	Safety Shoe	Pair	20
EQUIPMENTS			
60	Drilling Machine 14 dia	No's	1
61	Drilling Machine 10 dia	No's	1

62	Drill Bit 6,10,14,18 & 22 dia	No's	1 (Each)
63	Circular Saw Machine	No's	1
64	Planer Hitachi Make	No's	1
65	Sander Hitachi Make	No's	1
CONSUMABLES			
66	Nails 1",1.5",2".2.5",3"	Kg	2 Kg each
67	Shuttring oil	Ltr	5
68	Grease	Kg	2
69	Disel	Ltr	2
70	Cotton weste	Kg	2
71	Pencil	No's	10

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 ON-JOB TRAINING

Actual training will be conducted at ongoing construction project sites

ANNEXURE-II

GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

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

A) LECTURE

B) LESSON

C) DEMONSTRATION

D) PRACTICE

E) GROUP DISCUSSION

F) DISCUSSION WITH PEER GROUP

G) PROJECT WORK

H) INDUSTRIAL VISIT

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

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