Syllabus For Bricks Manufacturing Assistant (RPL)

Course Name	**Bricks Manufacturing Assistant (RPL)**
Sector	**CONSTRUCTION**
Course Code	**CON/2024/ZMAS/320**
Level	**4 (RPL)**
Occupation	**Bricks Manufacturing Assistant**
Course Duration	**Total Duration 80Hrs (T- 24 , P-56)**
Trainees' Entry Qualification	**Class VIII Pass with 5 years experience in the relevant field**
Trainers Qualification	**BE/ B.Tech in Civil / Construction Engineering with 2 Yrs Experience in related field OR Diploma in Civil Engineering with 3 Yrs experience in related filed. OR ITI in Mason Trade Or Graduate with Level 4 Certificate in related Trade with 4 Yrs experience in Training.**

SYLLABUS:

Theory & Practical

Unit -1 General Idea about bricks

1.1 Bricks – conventional bricks, standard bricks, composition of clay brick, strength of bricks, proportions of burnt clay bricks, testing of bricks, special bricks (fire clay brick, refractory brick, hollow blocks, fly ash bricks).

1.2 Concepts and Specifications:

Basic Concept, Fly Ash Block, Wall Properties, Physical specification

Unit -2 Specification and Quality Standards:

All the specification and quality standards given below are as per IS Code 12894 : 2002 and IS Code 16720 : 2018.

2.1 Raw material specification:

2.1.1 Pulverized fuel ash, Aggregates (Filler), Binder (Cement),Water, Chemical admixtures and Additives,

2.2 Product specification

2.2.1 Physical appearance, Dimensions, Compressive strength, Density, Drying shrinkage, Efflorescence Test, Water Absorptions, Limitations, Benefits, Classes of Modular Bricks & Fly Ash Bricks

Unit -3 Pre-production phase

Raw Material Pulverized fuel ash, Raw Material Filler, Raw Material Binder, Raw Material

Water, Transportation, Storage, Mix design

Unit -4 Production phase

4.1 :Brick Firing Process in the Kilns,
4.1.1.Steps in Brick Making
4.1.2:Firing Process in the Kilns:-Heating, Soaking, Cooling
4.1.3:Quality of Fired Bricks

Unit -5:Introduction to Brick Kilns

1.1 Classification based on Nature of Production Process,
1.1.1 Intermittent Kilns, & Continuous
Kilns 5.1.2:Classification based on Air -
Flow

Unit -6:Fuels

6.1.1.Relevant Fuel Properties

Unit -7: Specific Energy Consumption :

7.1.Definition, Measurement of Energy Input (External & Internal Fuel),Measurement of Wet of

Fired Bricks, 7.2Determination of SEC(Specific Energy Consumption) of Intermittent/batch Kilns, Determination of SEC of Continuous Kilns,
7.3 Precautions, 7.4.Uncertainty Analysis in the Measurement of SEC :7.4.1 Uncertainties in Products & Quotients, 7.4.2 Uncertainty in SEC, 7.5Significance of SEC(Specific Energy Consumption)

Unit -8: Instruments for Energy Monitoring,

Weighing Balance, Thermocouple, Infrared Thermometers, Moisture meter, Bomb Calorimeter

Unit -9:Curing phase

Dry and wet curing

Unit -10 Storing, Quality control and dispatch:

Storing, Quality Control , Dispatch

Unit -11:

- Preventive Maintenance ,Checking & Periodic Supervision for Proper Functioning of the Machines/Tools that are being used in the Plant/Industry

Unit -12:Testing of Bricks at the Site: (mainly Practical)

Total 04 NOS Testing-which are:

- **Compressive Strength Test**
- **Drying Shrinkage Test**
- **Efflorescence Test**
- **Water Absorption Test**

Objective:-/Course Outcome:

2. Identify various composition that are used for Brick Manufacturing.

3. Should be aware about Advantages & Dis-Advantages of using of Different types of Bricks & also about the different procedures & art of LOADING /FIRING in the Kilns.

4. Attaining knowledge about different types of Kilns that are being used in the Brick Manufacturing Industry.

5. Identify the quality of Raw Materials.

6. Identify (should be able to) the Description of Steps involved in different types of Brick Manufacturing

7. Should be able to Cure, Store & proper utilization of different types of Bricks, in the Industry.

8. After attending this Course, at the end of the Course, Students will be able to identify the following Parameters:

(i) different types of Machines/Tools that are needed for Manufacturing of Bricks in the Industry,

(ii) they will gain Idea about Market Cost of different Models of Machines/Tools which are currently being used in Bricks Industry & in the Kiln.

Course Outcome

1. Able to describe the manufacturing process of clay bricks along its applications.
2. Able to explain the materials required to manufacture clay bricks along with proper composition ratio.
3. Able to load green brick in chronological zig zag way for optimum heating of maximum number of bricks in the klin.
4. Able to make one charge for heating of maximum number of bricks to optimum temperature.

Able to describe the way of testing bricks in final condition

Sl No	Topic	Number of days required	Maximum Marks if 100 {Theory(T) 40 & Practical(P) 60 marks}
Unit-1	General Idea about bricks	Day01	T 06 P08
Unit-2	Specification and Quality Standards		
Unit -3	Pre-production phase	Day02 to 06	T13 P30
Unit -4	Production phase		
Unit -5	Introduction to Brick Kilns		
Unit -6	Fuels		
Unit -7	Specific Energy Consumption	Day07 to 08	T10 P08
Unit -8	Instruments for Energy Monitoring		
Unit -9	Curing phase		
Unit -10	Storing, Quality control and dispatch	Day 09th	T5 P06
Unit -11	Preventive Maintenance & Checking		
Unit -12	Testing of different Bricks at the Site	Day10th	T6 P08