

Syllabus For 'Masonry Work Assistant'

Course Name	Masonry Work Assistant
Course Code	CON/2023/MAWA/143
Occupation	Masonry Constructor
Job Description	Masonry Work Assistant supports masons and bricklayers in various construction projects. The job involves assisting with the construction of civil masonry works, operation of different construction machineries, construction plastering work, RCC works, shuttering and scaffolding works, quantity estimation and costing of Civil works.
Anticipated Volume of Training	360 Hrs (Theory- 90 Hrs + Practical- 150 Hrs, Employability Skill – 60 Hrs, OJT: 60 Hrs.)
NSQF LEVEL	3
Trainees' Entry Qualification	1. Grade 10 OR 2. Grade 8 pass and pursuing continuous schooling in regular school with vocational subject OR 3. Grade 8 Pass with 2 year experience OR 4. 5th Grade Pass with 5 yrs experience
Trainers Qualification	BE/B.Tech in Civil Engineering / Construction Engineering with 1Yr experience OR Diploma in Civil Engineering with 2 Yrs experience. OR ITI in Mason Trade in Building construction with 3 Yrs experience.

Structure of Course:

Module No.	Outcome	Theory (Hrs)	Practical (Hrs)	Total (Hrs)
Student will be able to				
1	Identify different Building Construction materials and make a Judgment on the quality of the same.	25	35	60
2	Construct different types of civil masonry works such as Brick walls, Cement Plastering, Concreting, Reinforcing steel binding, Shuttering and Scaffolding etc.	30	90	120
3	Identify different construction machineries and describe their applications	20	10	30
4	Find out the quantity of materials required for a masonry related job such as No of Bricks, Cement, Sand, Stone chips, Reinforcing steel, Shuttering and Scaffolding quantity etc. and their cost	15	15	30
5	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	--	60	60
6	Employability Skills	--	--	60
TOTAL:		90	210	360

SYLLABUS:

Module No. 1: Construction Materials

Outcome:

Identify different Building Construction materials and make a Judgment on the quality of the same.

Theory Content:

1.1 Bricks: Composition of brick earth, Characteristics of good bricks, classification of bricks, specific uses, size, weight, Special bricks – fly ash bricks, hollow bricks, fire clay bricks, Refractory bricks.

1.2 Cement: Types, uses and field tests of cement.

1.3 Sand: Types and their uses, characteristics of good sand, bulking of sand

1.4 Stone chips: Types and their uses

1.5 Reinforcing bar: Mild Steel, HYSD bar(TMT)

1.6 Timber: Characteristics of good timber, Preservation of timber, Uses, Alternative material to Timber.

1.7 Tiles: Roofing tiles – Types, uses. Floor Tiles-Types, uses. Paving Blocks.

Practical Content:

- Testing of Bricks: Size, shape, color, Water absorption quality.
- Test of Cement: Different types, Weight and Volume of one bag cement, Method of opening a cement bag, Preservation of cement bag, Different Field tests on cement.
- Test of Sand: Types as per size, their uses, Determination of unit weight, bulking factor, sieve analysis.
- Test of Stone chips: Types as per size and shape, their significance and uses, Determination of unit weight, sieve analysis.
- Timber: Characteristic of a good timber. Timber Preservation technique. Different cross section commonly used.
- Reinforcing Steel: Measure unit weight, length and dia. of different Steel Bar
- Use of different Floor and Roof Tiles, Paving blocks.

Module No. 2: Construction Technology

Outcome:

Construct different types of civil masonry works such as Brick walls, Cement Plastering, Concreting, Reinforcing steel binding, Shuttering and Scaffolding etc.

Theory Content:

2.1 Foundation: Concept and object of foundation, different types of shallow foundation.

2.2 Brick Masonry: General principles to be observed in brick masonry construction, bonds in brick work, different types of bonding – uses, mortar used in brick masonry.

2.3 Damp Proofing and Water proofing: Causes and effect of dampness, prevention of dampness, materials used for damp proofing, damp proofing treatment for basement, plinth, roofs, water proofing treatment for roofs.

2.4 Concrete: Types of mixing concrete: Hand mixing & Machine mixing, transportation, laying and compaction of concrete, curing of concrete.

Reinforced cement concrete (R.C.C.) – Reinforcement, nominal mix proportion, grades of concrete.

2.5 Form work: Scaffolding and staging – Materials used, requirement of good form work-types and removal of form work.

2.6 Flooring: Object, materials used, types –construction details of artificial stone floor, Marble floor, Tiles floor.

2.7 Plastering: Types, Pointing mortar used for plaster, preparation of surface and application of plaster.

2.8 Stairs: Technical name of different parts of a stair. Basic concept of lift and Escalator.

2.9 Culvert & Bridge: Introduction of Culvert & Bridge. Classification of culverts, Component parts of culvert.

Practical Content:

- **Brick Masonry:** brick masonry construction with different bonds in brick work, preparation of different grade of mortar used in brick masonry.
- **Damp Proofing and Water proofing: Proper use of damp proofing** for basement, plinth, roofs, water proofing treatment for roofs.
- **Concrete:** Mixing of concrete by hand mixing & machine mixing, method of transportation, laying and compaction of concrete, curing of concrete.
- Reinforced cement concrete (R.C.C.) – Reinforcement, nominal mix proportion, different grades of concrete making.

- **Form work:** Do's and Don'ts of good form work-types and removal of form work.
- **Flooring:** construction details of artificial stone floor, Marble floor, Tiles floor.
- **Plastering:** preparation of surface and steps to be followed for cement plastering

- **Stairs:** Technical name of different parts of a stair through models.
- **Culvert & Bridge:** Identification of different parts of culverts through models.

Module No. 3: Construction Machineries

Outcome:

Identify different construction machineries and describe their applications

Theory Content:

3.1 Construction Machineries: Different machineries, tools & plants used in construction site, identification & specific use, concrete mixer-types-capacity-working principle, Vibrators-types-working principles, floor grinding machines, pumps.

Practical Content:

- Follow how to use of concrete mixer, vibrator, floor grinding machines, pumps etc. in construction field.

Module No. 4: Estimating and Costing

Outcome:

Find out the quantity of materials and cost required for a masonry related job such as No of Bricks, Cement, Sand, Stone chips, Reinforcing steel, Shuttering and Scaffolding quantity etc.

Theory Content:

Estimating and Costing:

4.1 Calculation of quantity of materials required for different items of works such as Brick flat soling, Plain Cement concrete(1:3:6), R.C.C. works(1:1.5:3), Brick work in cement mortar(1:6), Brick work for half brick thick wall with cement mortar(1:4), D.P.C.(1:1.5:3), Plastering work(1:6), Artificial stone flooring(1:2:4) and their cost

Practical Content:

Calculate quantity of materials required for different items of works such as Brick flat soling, Plain Cement concrete(1:3:6), R.C.C. works(1:1.5:3, 1:1:2),Brick work in cement mortar(1:6), Brick work for half brick thick wall with cement mortar(1:4), D.P.C.(1:1.5:3), Plastering work(1:6), Artificial stone flooring(1:2:4) and their cost

Module No. 5: Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).

Outcome:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain.

Theory Content:

Practical Content:

Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain. (The trainee is expected to undertake work in actual workplace under any supervisor / contractor for 60 Hours.)

Module No. 6: Employability Skills

Outcome:

- Describe the traits of individual at workplace
- Demonstrate apply employability and entrepreneurship skills at workplace

Theory Content:

- Discuss the importance of Employability Skills in meeting the job requirements.
- Explain constitutional values, civic rights, duties, citizenship, responsibility towards society etc. that are required to be followed to become a responsible citizen.
- Discuss 21st century skills.
- Display positive attitude, self -motivation, problem solving, time management skills and continuous learning mindset in different situations.
- Discuss the significance of reporting sexual harassment issues in time
- Discuss the significance of using financial products and services safely and securely.
- Explain the significance of approaching the concerned authorities in time for any exploitation as per legal rights and laws
- Explain the importance of managing expenses, income, and savings.
- Discuss the significance of using internet for browsing, accessing social media platforms, safely and securely
- Discuss the need for identifying opportunities for potential business, sources for arranging money and potential legal and financial challenges
- Differentiate between types of customers
- Explain the significance of identifying customer needs and addressing them
- Discuss the significance of maintaining hygiene and dressing appropriately
- Discuss the significance of dressing up neatly and maintaining hygiene for an interview
- Discuss how to search and register for apprenticeship opportunities

Practical Content:

- Show how to practice different environmentally sustainable practices
- Use appropriate basic English sentences/phrases while speaking
- Demonstrate how to communicate in a well -mannered way with others
- Demonstrate working with others in a team
- Show how to conduct oneself appropriately with all genders and PwD
- Show how to operate digital devices and use the associated applications and features, safely and securely
- Create a biodata
- Use various sources to search and apply for jobs

Module No.	Outcome	Assessment Criteria
1	Identify different Building Construction materials and make a Judgment on the quality of the same.	<ul style="list-style-type: none">• Identify different construction materials such as bricks, cement, sand, stone chips etc.• Explain their different types and uses• Define characteristics of good materials• Explain different field tests on cement
2	Construct different types of civil masonry works such as Brick walls, Cement Plastering, Concreting, Reinforcing steel binding, Shuttering and Scaffolding etc.	<ul style="list-style-type: none">• Explain steps to be followed for constructing brickworks of different thickness• Explain steps to be followed for preparation of concrete• Explain method of plastering• Explain method of constructing different floors• Explain method of laying D.P.C• Explain proper use of shuttering and scaffolding materials.• Name different components of stairs.
3	Identify different construction machineries and describe their applications	<ul style="list-style-type: none">• Explain different types of construction machineries used in construction site.
4	Find out the quantity of materials required for a masonry related job such as No of Bricks, Cement, Sand, Stone chips, Reinforcing steel, Shuttering and Scaffolding quantity etc. and their cost	<ul style="list-style-type: none">• Estimate the calculation of quantities of materials required for different items of work and approximate cost involved
5	Work in real job situation with special emphasis on basic safety and hazards in this domain (OJT).	Assessor will check report prepared for this component of Practical training of the course and assess whether competency has been developed to work in the real job situation with special emphasis on basic safety and hazards in this domain.
6	Employability Skills	As per NCVET guided curriculum

List of Tools, Equipment & materials needed for 30 Trainees:

Sl No	Items with description	Qty
1.	Masonry tools: Brick Hammer Brick Trowel Gauging Trowel Margin Trowel Finishing Trowel Wooden Float Metal Float Plumb Bob Right angled scale Aluminium Channel (rectangular hollow section) 3 feet long Rope Measuring steel tape(5 m long) Mixing tray Mortar Pan Shovel Bucket Level tube Wire brush	3 nos each
2.	Geometric Model (Wooden / Plastic) – Culvert , Bridge and Stair(Dog legged)	1 no each
3.	Consumables Materials:	
	Traditional bricks	100nos
	Floor Tiles (2ft x 2ft)	1 packet
	Sand	5 cft
	Stone Chips (20mm/15 mm/10 mm/6 mm nominal sizes)	2 cft of each size
	Hollow bricks	10 nos
	Fly ash bricks	10 nos
	Sample of Tor Steel and TMT bar of 1m length of different diameter	1 no each
	Cement	2 bags
	Paving blocks	20 nos
4.	Digital weighing machine 1gm sensitivity	1 no
5.	Sand screen	2 nos