Participant Handbook

Helper Mason

Qualifications Pack- Helper Mason

- **SECTOR** - CONSTRUCTION
- **SUB-SECTOR** - Building & Factories, Heavy Infrastructure (Rail, Road & Runways), Power Generation (Dam and Transmission & Distribution etc.)
- **OCCUPATION** - Masonry
- **REFERENCE ID** - CON/Q 0101
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Participant’s Feedback Form
Welcome Note

Dear Participant,

Welcome to this training programme titled “Helper Mason”. As the title itself suggests, the focus of this programme is none other than you yourself. Did you know that the construction industry in India is the second largest employment provider after agriculture? With a boom in the construction industry, there is a dire need for skilled Masons and Helper Masons. If you skill yourself, then there are jobs galore in this industry waiting to be grabbed.

As a Helper Mason your primary tasks will be on brickworks, RCC work, plastering to name a few. Our entire training programme focuses and emphasises on these critical modules. This book details out the step by step procedure for all construction related tasks that you must learn. It is replete with photographs to help you understand. Every module begins by listing the objectives so as to help you understand what you will learn and achieve. At the end, you have the opportunity to summarise your learnings and finally take up a small quiz in the form of a worksheet to check your understanding. It is recommended that at the end of each day, you go through the modules that were covered during the day as a revision. Right at the end, are included some soft skills modules. Soft skills are as important as hard skills. You may be excellent in your job, but if you do not possess soft skills then it is likely that the industry may not prefer you. Along with soft skills, health hygiene and safety too are equally important. Remember a Helper Mason’s job can cause physical strain due to prolonged work hours in the Sun. So what you eat, the importance of some stretching exercises to keep fit and good sleep are as vital. Your Trainer will give you insights into these too.

So, on that short note, we welcome you yet again to this training programme. We hope you will benefit and skill yourself. Best of luck!
# Course 8

## Module 1

**Introduction to Brick Wall**

At the end of this module you will be able to:

- Define brick masonry.
- State the types of bricks.
- Explain the meaning of the terms related to brick masonry.

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<th>Session Plan</th>
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## Module Overview

Bricks are the main building blocks of almost all the structures. In this module, you will learn about the types of bricks and terms related to brick masonry.
Brick Masonry

Brick masonry refers to the systematic arrangement of bricks and bonding them together with mortar.

Types of Bricks

Bricks are obtained by moulding clay in rectangular blocks of uniform size and then by drying and burning these blocks.

There are three major types of bricks, such as:

- Clay bricks
- Fly ash bricks
- Cement bricks

The major component in clay bricks is clay. These bricks are the most common ones.

- Fly ash bricks are made up of waste material obtained by burning coal or lignite in power plants.
- Cement bricks are made up of cement fine aggregates and sometimes coarse aggregates.
Terms Related to Brick Masonry

Here are the common terms related to brick masonry:

- **Lap** is the horizontal distance between two successive courses.
- **Bed** is a layer of mortar.
- **Bed joint** is a horizontal layer of mortar upon which the bricks are laid.
- **Queen closer** is a piece of brick used to close up the bond at the end of the brick course.
- **A frog** is a depression created on the surface of a brick.
- **Brick-bat** is a piece of brick used in completing a course.
- **Header** refers to laying of bricks with their breadth or width parallel to the face or direction of the wall.
- **Stretcher** refers to laying of bricks with their length parallel to the face or direction of the wall.
- **Arrises** are edges formed by the intersection of plane surface of bricks.
- **Course** is a row of bricks either in header or stretcher position.
Key Learnings

Summarize your learning here. Write your answers in the spaces provided.

1. Define the terms stretcher, header, course, bed, frog and brick-bat.

2. Identify the images. Write the terms to describe them.

Worksheet

1. Match the columns.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Bed</td>
<td>A dug on the brick</td>
</tr>
<tr>
<td>b. Brick-bat</td>
<td>A layer of mortar</td>
</tr>
<tr>
<td>c. Frog</td>
<td>Used in completing a course</td>
</tr>
<tr>
<td>d. Arrises</td>
<td>Edges formed</td>
</tr>
</tbody>
</table>
Quality Testing of Bricks

At the end of this module you will be able to:

◆ Differentiate a good quality brick from a poor quality brick.

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<th>Session Plan</th>
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<td>8</td>
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</tbody>
</table>

Module Overview

Bricks play a major role in construction. Hence, it is necessary that you select bricks of good quality. In this module, you will learn the methods to identify good quality from the poor quality bricks.
Hardness Test

To test the hardness of a brick:
- Scratch the brick with your fingernail.
- Check if any impression of the nail appears on the brick.
- If you find an impression it is not a good quality brick as no impression will be made on a good brick.

Water Absorption Test

To determine the percentage of water absorption of bricks:
- Choose a brick. Measure the weight of the brick. Weight of brick $M_1$ is equal to, say 4 kilograms and weight of brick $M_2$ is, say 3 kilograms.
- Immerse the bricks in water for 24 hours.
- Remove the bricks from water.
- Measure the weight of the brick after immersing in water for 24 hrs. Weight of brick $M_2$ in first scenario is 5 and weight of brick $M_2$ in 2nd scenario is three point one five kilograms.
- You can check the percentage of water absorbed by brick using the formula: $\frac{M_2 - M_1}{M_1} \times 100$
- A poor quality brick absorbs water much beyond 20% its own weight
- A good brick should NOT absorb water more than 20% of its weight.

Brick absorbs < 5% of its weight - Good quality
**Strength Test**

To test the strength of a brick:
- Holding a brick 3 to 4 feet high.
- Drop it to the ground.
- Poor quality brick breaks.
- A good brick does not break.

**Toughness Test**

To test the toughness of the brick:
- Hold two bricks each one in a hand and strike them together.
- Poor quality brick does not produce ringing sound.
- Good quality brick produces a ringing sound upon striking.

**What Brick to Buy?**

Along with testing the quality of the bricks, check that the bricks chosen are of defined size:
- A brick should be of 25 cm length, 12.5 cm height and 7.5 cm width.
- Volume of a standard brick is 2343 cubic centimetres and volume of brick with mortar is 2500 cubic centimetres.
- Avoid over burnt bricks. An over burnt brick is one that has black patches.
Key Learnings

Summarize your learning here. Write your answers in the spaces provided.

1. What are the various tests you will perform to differentiate good quality bricks from poor quality?
   
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________
   __________________________________________________________

Worksheet

1. Read the question. Tick on the correct answer.
   A poor quality brick absorbs water more than ________________% of its own weight.
   a. 20
   b. 6
   c. 4
   d. 3

2. Read the question. Tick on the correct answer.
   A good ________________ does not break.
   a. Brick
   b. Sand
   c. Cement
   d. Clay

3. Read the question. Tick on the correct answer.
   A brick should be of 25 cm ________________, and 12.5 cm height.
   a. Length
   b. Height
   c. Width
   d. Breadth
4. Read the question. Tick on the correct answer.
   _________________ of a standard brick is 2343 cubic centimetres.
   a. Volume
   b. Breadth
   c. Height
   d. Depth

5. Read the question. Tick on the correct answer.
   An over burnt brick has _________________ patches.
   a. Orange
   b. Black
   c. Red
   d. White

6. Read the question. Tick on the correct answer.
   Volume of brick with _________________ is 2500 cubic centimetres.
   a. Cement
   b. Mortar
   c. Sand
   d. Clay

7. Read the question. Tick on the correct answer.
   A good quality brick doesn’t break when dropped from _________________ feet high.
   a. 3 to 4
   b. 4 to 6
   c. 4 to 3
   d. 3 to 5

8. Read the question. Tick on the correct answer.
   The formula used to check the percentage of water absorbed by brick is _________________.
   a. \[ \frac{M_2 - M_1}{M_1} \times 100 \]
   b. \[ \frac{M_2 - M_1}{M_2} \times 100 \]
   c. \[ \frac{M_2 + M_1}{M_1} \times 100 \]
   d. \[ \frac{M_2 + M_1}{M_2} \times 100 \]
9. Read the question. Tick on the correct answer.

Bricks should be immersed in water for ________________.
   a. 24 hours
   b. 2 hours
   c. 12 hours
   d. 22 hours

10. Read the question. Tick on the correct answer.

Good quality bricks can be identified by performing the ________________ to test hardness of the brick.
   a. Hardness test
   b. Roughness test
   c. Smoothness test
   d. Quality test

11. Identify good quality brick from poor quality brick. Tick on the good quality brick.

![Images of bricks]

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**Notes**

________________________________________________________________________
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<table>
<thead>
<tr>
<th>Session Plan</th>
<th>18/05/2012</th>
<th>Version Update Date</th>
<th>Assistant Mason</th>
<th>NSDC</th>
<th>Minimum qualification – 10th / 12th pass</th>
<th>After completing this program, participants will be able to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program Name</td>
<td>Name of Client</td>
<td>Program Name</td>
<td>Version No.</td>
<td>Pre-requisites to Training</td>
<td>Training Outcomes</td>
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<td></td>
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<td></td>
<td>Prepare mortar</td>
<td>Construct a half brick wall with different bonds</td>
<td>Construct a full brick wall with different bonds</td>
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<td>Construct a one and a half brick wall with different bonds</td>
<td>Construct a two brick wall with different bonds</td>
<td>Construct a cement block wall upto 3 feet</td>
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<td>Fix door and window frames</td>
<td>Erect and dismantle scaffolding</td>
<td>Constructure RCC beam and column</td>
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<td>Do surface finishing</td>
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<td>Sr. No.</td>
<td>Module</td>
<td>Session</td>
<td>Objectives</td>
<td>Methodology</td>
<td>Tools</td>
<td>Time</td>
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<tr>
<td>1</td>
<td>Morning Energizer</td>
<td>Morning starter song/Good sayings/Stretching Exercises/Prayer/Moral stories</td>
<td>To energize the participants to take on the day</td>
<td>◆ Group participation</td>
<td>◆ Songs provided in Trainer’s guide</td>
<td>10 mins.</td>
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<tr>
<td>2</td>
<td>Icebreaker</td>
<td>Icebreaker</td>
<td>To introduce each other and build rapport with fellow participants and Trainer</td>
<td>◆ Activity</td>
<td>◆ Interactive Game from Trainer Guide</td>
<td>1 hr. 40 mins</td>
</tr>
<tr>
<td>3</td>
<td>Introduction to Masonry</td>
<td>Introduction</td>
<td>1. Explain about the trade of masonry</td>
<td>◆ Multimedia based learning</td>
<td>◆ Multimedia (K – Yan)</td>
<td>1 hr 15 mins</td>
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<td></td>
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<td>2. State the roles and responsibilities of an Assistant Mason</td>
<td>◆ Trainer led discussion</td>
<td>◆ Participant handbook</td>
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<td></td>
<td>◆ Memorization and transfer of knowledge</td>
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<td>4</td>
<td>Building: Types and Components</td>
<td>Types and Components</td>
<td>1. State the sequence of construction activities starting from foundation to finishing</td>
<td>◆ Multimedia based learning</td>
<td>◆ Multimedia (K – Yan)</td>
<td>2 hrs 20 mins</td>
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<td>2. Explain the function of each component</td>
<td>◆ Trainer led discussion</td>
<td>◆ Participant handbook</td>
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<td>◆ Memorization and transfer of knowledge</td>
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<tr>
<td>5</td>
<td>Building: Types and Components</td>
<td>Practical: Identifying Building Components</td>
<td>Identify different building components</td>
<td>◆ Real life observation</td>
<td>◆ Site visit of building under construction as well as those fully constructed</td>
<td>1 hr 20 mins</td>
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<td>Sr. No.</td>
<td>Module</td>
<td>Session</td>
<td>Objectives</td>
<td>Methodology</td>
<td>Tools</td>
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<td>Morning Energizer</td>
<td>Morning starter song/Good sayings/Stretching Exercises/Prayer/ Moral stories</td>
<td>To energize the participants to take on the day</td>
<td>Group participation</td>
<td>Songs provided in Trainer’s guide</td>
<td>10 mins.</td>
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<tr>
<td>2</td>
<td>Building: Types and Components</td>
<td>Recap</td>
<td>To revise all that was learnt on the previous day</td>
<td>Trainer led discussion</td>
<td>Asking question</td>
<td>10 mins</td>
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<td>Question based discussion</td>
<td>Multimedia</td>
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<td>Memorization and transfer of knowledge</td>
<td>Participant’s handbook</td>
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<tr>
<td>3</td>
<td>Building Materials</td>
<td>Introduction to Building Materials</td>
<td>1. Identify the different building materials 2. State the uses of each</td>
<td>Multimedia based learning</td>
<td>Multimedia (K – Yan)</td>
<td>1 hr 40 mins</td>
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<td>Trainer led discussion</td>
<td>Participant handbook</td>
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<td>Memorization and transfer of knowledge</td>
<td>Poster</td>
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<tr>
<td>4</td>
<td>Building Materials</td>
<td>Practical: Building Materials</td>
<td>Identify the different building materials</td>
<td>Guide practice (Work with me)</td>
<td>Samples of various building material</td>
<td>1 hr 15 mins</td>
</tr>
<tr>
<td>5</td>
<td>Building Materials</td>
<td>Material Handling and Stacking</td>
<td>Demonstrate the correct procedure in transporting, handling and stacking of the various materials</td>
<td>Multimedia based learning</td>
<td>Multimedia (K – Yan)</td>
<td>40 mins</td>
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<td>Trainer led discussion</td>
<td>Participant handbook</td>
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<td>Memorization and transfer of knowledge</td>
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<tr>
<td>6</td>
<td>Building Materials</td>
<td>Practical Material Handling</td>
<td>Practice the correct procedure in transporting, handling and stacking of the various materials</td>
<td>Hands on practice (Try me)</td>
<td>Stacks of different building materials</td>
<td>40 mins</td>
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<tr>
<td>Sr. No.</td>
<td>Module</td>
<td>Session</td>
<td>Objectives</td>
<td>Methodology</td>
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<td>Morning Energizer</td>
<td>Morning starter song/Good sayings/Stretching Exercises/Prayer/Moral stories</td>
<td>To energize the participants to take on the day</td>
<td>◆ Group participation</td>
<td>◆ Songs provided in Trainer’s guide</td>
<td>10 mins</td>
</tr>
<tr>
<td>2</td>
<td>Doors and Windows/Related Activities</td>
<td>Recap</td>
<td>To revise all that was learnt on the previous day</td>
<td>◆ Facilitator led discussion</td>
<td>◆ Multimedia</td>
<td>10 mins</td>
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<td></td>
<td>◆ Question based discussion (Expository methods)</td>
<td>◆ Participant’s handbook</td>
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<td>◆ Remediation</td>
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<tr>
<td>3</td>
<td>Foundation</td>
<td>Assessment - Foundation</td>
<td>To evaluate the students on their learning of the topic</td>
<td>◆ Practical assessment (Summative evaluation)</td>
<td>◆ Assessment guide</td>
<td>2 hr 55 mins</td>
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<tr>
<td>4</td>
<td>Brick work</td>
<td>Assessment - Brick Flooring &amp; Cement Flooring</td>
<td>To evaluate the students on their learning of the topic</td>
<td>◆ Practical assessment (Summative evaluation)</td>
<td>◆ Assessment guide</td>
<td>2 hr 20 mins</td>
</tr>
<tr>
<td>5</td>
<td>Surface finishing</td>
<td>Assessment - Double Plaster</td>
<td>To evaluate the students on their learning of the topic</td>
<td>◆ Practical assessment (Summative evaluation)</td>
<td>◆ Assessment guide</td>
<td>1 hr 20 mins</td>
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