

3. How do I select the RIGHT MATERIALS?



Are you worried about your mason or contractor selecting low quality materials?
Does your house show damages because poor quality materials were used?

This toolkit shares easy -to-follow tips to identify and select good materials.

Select good materials today- save money on repairs tomorrow

To build an affordable home, many homeowners, contractors or labourers may select materials of lower quality. This leads to quicker damage to the house, and ongoing repairs that are very expensive.

Follow this handbook to select yourself or supervise the selection of materials to construct your dream home. Investing in quality materials today will save time and money tomorrow.



Tips to select GOOD MATERIALS



1. If you're buying the materials yourself, follow the steps in this guide to **choose each batch carefully**.
2. If your mason or contractor is buying the materials, **check some of the batches yourself** to make sure they're good quality.
3. If you find poor-quality materials, **don't use them**—return the batch.
4. **Spending on good materials** now will save you from costly repairs later.

Ordering some bricks, and what to know it its good quality?

A. BRICKS

Common Types of Bricks



Burnt Clay Bricks
Most Commonly used



Fly ash clay bricks
Lesser strength
Prone to moisture



Concrete Blocks
Excellent strength
Provide clean look for walls



CSEB Blocks
Cost-effective
Eco-friendly

CLAY BRICKS



1. There should be no cracks on the bricks, and they should not break easily.
2. Bricks must be uniformly reddish brown in color.
3. Brick must be uniform in size with sharp edges and at right angles.
4. There should be a shallow depression on the longer side of the brick.
5. Bricks should be free from lime particles.

CONCRETE BLOCKS AND FLY ASH BRICKS



1. Blocks must meet ISI standards.
2. If concrete blocks are being made on site, make sure they are made with vibration using concrete mix 1 : 4 : 8 (cement : sand : aggregate) or richer.
3. Blocks must be free from cracks, distortions and broken or crumbling edges.
4. All blocks must be uniform in size, with sharp edges at right angle.
5. Blocks can be either hollow or have a shallow depression on the longer face.

Ordering some bricks, and want to know if it is of good quality?

B. TESTING OF THE BRICKS

Perform the following tests to 3-4 randomly selected bricks from a batch.

Drop test for Bricks and Blocks



Bricks are strong
if they do not break in this test



Bricks are weak
if they break in this test

Metallic Ring Test for Bricks



Metallic ring sound
must be heard on striking

1. It is very important to test bricks to ensure strength in the house & value for money paid.
2. Return the whole order if majority of the bricks fail the test.

Remember to cure bricks and blocks in water !

- ✓ Curing is done in 2 stages -
Before use - soaking bricks in water
After wall is constructed - Keeping the wall wet for 10 days minimum.

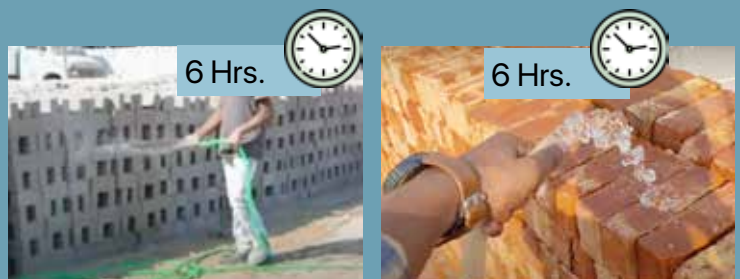
Freshly made blocks

Keep wet for minimum 15 days before use



Purchased Cement blocks & Clay bricks

Keep wet for minimum 6 hours before use.

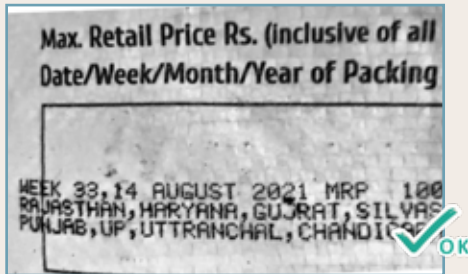


Ordering some cement, and want to know if it is of good quality?

C.

CHECKING CEMENT BAGS

Check the following on the cement bags before buying:



Date of Manufacture, shouldn't be more than 3 months old. Always buy fresh cement bags.



ISI Mark with appropriate number.

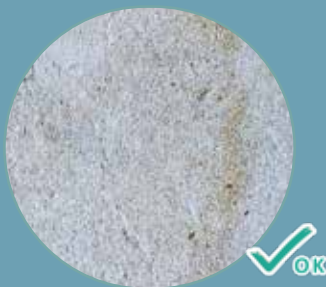


Check cement Grade is as ordered. Always use 'Grade 43' or 'Grade 53' Cement.



Cement bag should be well sealed & not have any holes.

How to test the quality of cement



✓ Texture should be very fine and smooth.

✓ Feel the temperature of the cement, it should be cool and not warm.



✗ Cement should not have lumps. If so, discard the bag.

✗ Never use hardened cement.

Ordering some cement, and want to know if it is of good quality?

D. CHECKING CEMENT BAGS

1. Store cement in a dry place.
2. Make a raised platform for storing cement so that it doesn't catch moisture from the ground.
3. Do not lean bags against walls that are prone to retain moisture.
4. Wrap in plastic bags to avoid moisture.
5. Never use hooks on cement bags.



✓ OK



If cement is so prone to damage while being stored, what should we do?



It should be purchased in small quantities, just enough to take care of immediate needs. Bags must be opened only when the cement is to be used.



Points to note!

- ✓ If cement fails the above tests, be sure to discard the whole bag.
- ✓ Never use old, damaged or low quality cement for construction, as that can lead to grave damage expensive repairs.
- ✓ All construction involving cement needs to be cured with water. Water helps cement gain its strength & harden.

Building your house out of concrete? Choose all the materials well!

E.

COMPONENTS OF CONCRETE

Large stones



Use non-porous stones with sharp edges.



Do not use round, smooth textured, or soft stones.

Aggregate



Use a mix of small stone sizes, ranging from 10mm to 25 mm.



Do not use round, smooth textured stones as aggregate

Sand



1. Filter Sand using Jaali mesh before use
2. Sand should contain only a small amount of clay



1. Do not use sand having dirt & organic material, or high clay content
2. Do not use sand with salt content

Testing of Clay content in Sand

Sand should contain only a small amount of clay (not more than 8%). This is how you can test how much clay is present in the sand.

1. Fill the one-third jar with cleaned, sifted sand to be tested
2. Add one tablespoon of powdered dish-washing detergent
3. Fill the jar with clean water, & shake well
4. Leave the jar on a level spot for 48 hours
5. Mark & measure the height of each type of soil layer of different color

The topmost layer, i.e. clay, should not have a height more than 8% of the total height of soil layers



Sample is good



Sample has too much clay

Building your house out of concrete? Choose all the materials well!

F.

COMPONENTS OF CONCRETE

Steel

Do!

1. Bars should have ISI mark
2. Check bar diameter before use
3. Steel bars should be ribbed
4. Steel bar should pass the bend test



Don't!

1. Do not use steel bars that are rusted.
2. Always store steel bars away from water



'Bend Test' for Steel Bars

Strong Steel bars should pass the bend test on site. Don't use steel bars that are brittle & crack on Z-bars bend at larger radii.



Water

Do!

1. Water should be clean, colorless, potable and without smell.
2. The construction site must have enough water storage facility needed for 24 hours'



Don't!

1. Do not use sea water for any purpose.
2. Water should be free from impurities, organic matter, oils, and acids.



In regions where water is scarce, choose a construction method which requires less water.

How do you make sure your cement mix is correct?

G.

MIXING RATIO FOR CONCRETE

Proper Mixing Method



Measuring utensil must be filled to the brim while measuring quantities.



Mix all dry ingredients for concrete thoroughly before adding water.



Use the cement within 45 minutes after adding water. Do not use the cement once it begins to harden.

For explaining the various proportions, the 4 main elements have been represented with the following icons:



Cement



Sand



Aggregate



Water



Ensure that correct proportions for cement are followed by your team. Compromise in the quantity of cement, sand, aggregate and water will weaken the structure of the house, and reduce its safety and lifespan.

How do you make sure your concrete mix is correct?

H.

MIXING RATIO FOR CONCRETE

Concrete Mix for PCC



What is PCC?

PCC' or 'Plain Cement Concrete', means the use of concrete without any steel bars.

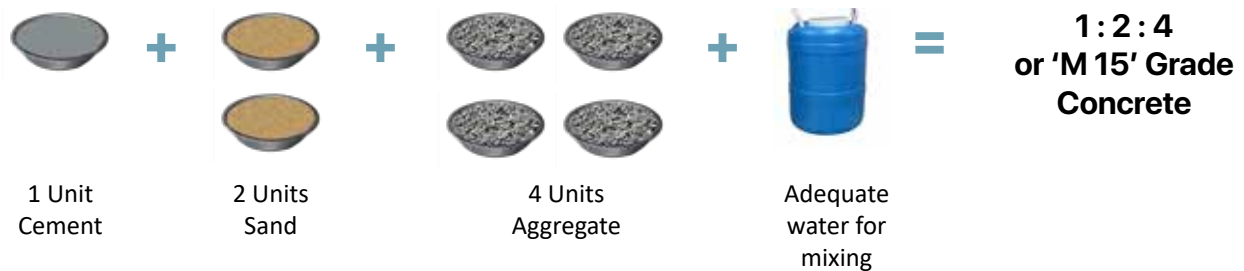
Where is PCC used?

PCC is used to make a steady, leveled base over compacted earth, for foundations, flooring, etc.

What is the Grade for this type?

Minimum grade is 'M15'

Mixing Ratio for PCC



Concrete Mix for RCC



What is RCC?

RCC' or 'Reinforced Cement Concrete', means the use of concrete with steel bars.

Where is RCC used?

RCC is used to make beams, columns, slabs and foundation, that carry the load of the building.

What is the Grade for this type?

Minimum grade is 'M20'

Mixing Ratio for RCC



How do you make sure your concrete mix is correct?

I.

MIXING RATIO FOR MORTAR AND PLASTER

Cement Mortar Mix



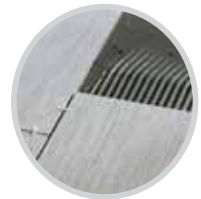
What is Mortar?

Mortar is used to bind building blocks such as stones, bricks, and concrete masonry units

Mixing Ratio for Mortar



Wall Masonry



Flooring Mortar bed

Cement Plaster Mix



What is Plaster?

Cement plaster is a mixture of cement, sand and water, and is applied on internal and external walls. It protects the walls from excess moisture, thus increasing the lifespan of the walls.

Mixing Ratio for External Plaster



External Wall Plaster

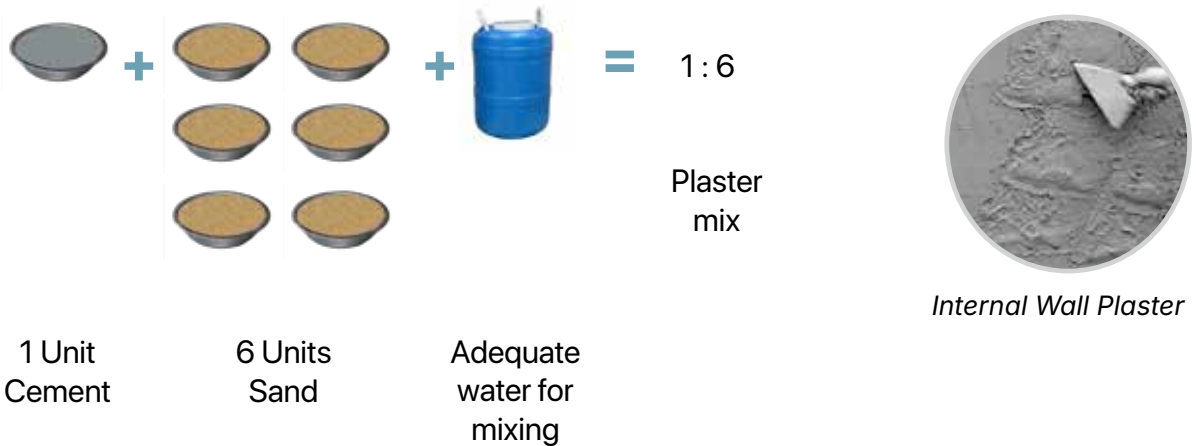
This is important & needs to be richer in cement than internal plaster as it is in direct contact with natural elements.

How do you make sure your concrete mix is correct?

I.

MIXING RATIO FOR PLASTER

Mixing Ratio for External Plaster



Any compromise with mixing and proportions of materials as mentioned above will lead to an unsafe structure, and require expensive repairs in future. In heavy monsoon areas, add water-proofing chemicals to the plaster.









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4. How do I select the right construction team and supervise the work?
5. How to develop the site and construct a strong foundation?
6. How to build strong walls and design windows?
7. How to build a strong roof?
8. How to choose the structural system for your home?
9. How to build a well-serviced home?
10. What are the tips for good RCC construction?
11. How do I maintain my home after construction?
12. How do I design my home?

Disclaimer:

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