SURYA GOLD CEMENT

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CEMENT
USERS' GUIDE

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Proper Storage of Cement-

Exposure to moisture should be avoided:

The cement should be stored in such a way that it doesn't get exposed to moisture.

- The cement should be stored in closed rooms on elevated wooden platforms and away from the walls.
- Only the quantity required for the day's work should be taken out.
- Care should be taken that the cement bags are not left exposed to rain or dew.

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Use clean and good aggregates and store on a clean platform

To ensure the strength of the concrete

- The aggregates and sand used in the concrete should be clean
- Sand should not be stacked directly on the ground
- Always cover the ground before stacking the aggregates.

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Always use potable water to make concrete

To ensure the quality of the concrete

- Use water free from organic or mineral impurities, they have a detrimental affect on the strength of the concrete.
- Do not use water from the ponds or community tanks containing decaying organic matter.
- Water containing sulphates and chlorides should not be used.
- Water stored in arid regions and industrial waste and effluent discharge areas should not be used.

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Determine proportions of concrete ingredients with a measuring box

- Concrete is proportioned by weighing the individual ingredients
- Adjust the moisture in the aggregates and sand.
- In case the aggregates and coarse sand are of consistent quality and source, the proportioning of the ingredients can be done by converted volume basis
- The basic requirement for proportioning by volume is to have a measurement box (farma), the volume of which is equal to the volume of cement in a bag (35L). A convenient size of the farma is 350X250X400 mm.
- The practice of using tasla, ghamela or empty cement bags is an incorrect practice as it entails a chance of erroneous proportioning.

Use no more than 25-30 litres of water to make concrete

- The water-cement ratio is the weight of the mixing water divided by the weight of the cement.
- Usually, less water produces higher quality concrete, provided the concrete is properly placed, consolidated, and cured.
- The desired degree of workability is attained by running a series of trial batches, using various amounts of fine to coarse aggregate, until a batch is produced that has the desired slump.
- Never yield to the temptation to add more water without making the corresponding adjustment in the cement content and make sure that crewmembers spreading a stiff mix by hand do not ease their labors by this method without telling you.

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Prefer concrete mixer, or mix the concrete manually on watertight platform

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- Mix the materials properly in a concrete mixer having a loading skip attached to it.
- If mixers are unavailable, the operation should be carried out manually on a clean and impervious platform.
- The correct technique of hand mixing is:
  - Mix the measured quantity of cement (10% extra cement included) and sand in dry state to a homogeneous colour.
  - Prepare a homogeneous paste by adding a measured quantity of water to the mixture.
  - Spread the measured quantity of the coarse aggregate to a pile of a uniform thickness of 6 inches to 8 inches.
  - Spread the entire quantity of the paste in uniform thickness on top of the aggregate pile.
  - Mix the aggregate and the paste to a homogeneous consistency.

The amount of mix prepared should be such that it can be used within 30-45 minutes

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Concrete changes state quite quickly. The different states of concrete or mortar are Plastic, Setting and Hardening

- Concrete or mortar should remain plastic while mixing, placing and compaction are being performed. The reactions between the added water and cement in the concrete should not have reached the required rate yet to make the paste stiff.
- Concrete then begins to stiffen. The stiffening is called setting and it should be done only after compaction is over and finishing operations are in progress. As a thumb rule, all the operations should be carried out within 45 minutes of adding water to the mix.

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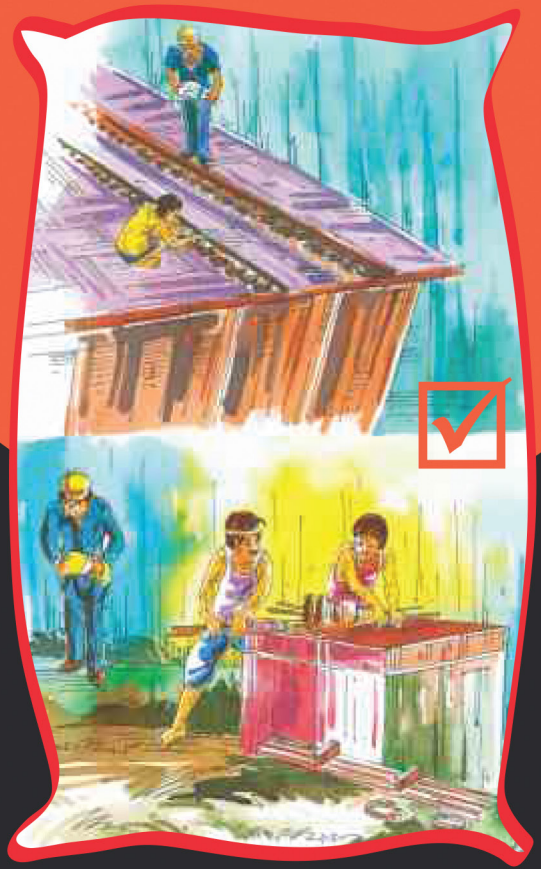

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In RCC works, the reinforcement steel should be placed under competent technical supervision.

- A poorly designed RCC member can undermine the entire structure and pose hazard to the lives of the occupants.
- A competent professional should be engaged to decide the manner in which the reinforcement steel is to be used.

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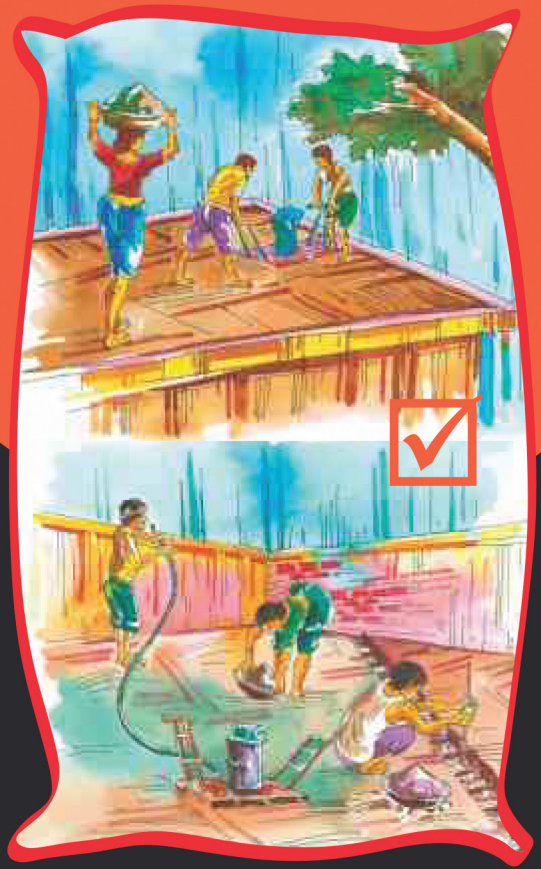
The concrete should be placed carefully in forms, taking care that ingredients do not segregate

To avoid segregation:

- Check the concrete is not too wet or too dry.
- Make sure the concrete is properly mixed.
- The concrete should be mixed correctly for at least two minutes before discharge.
- The concrete should be placed as soon as possible.
- When transporting the mix, load carefully and transport the mix without jerks
- While placing the concrete, never let the concrete fall more than one-and-a-half metres.



Concrete should be well compacted to remove air voids

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How to compact

- Compaction is done by shaking or vibrating the concrete, which liquefies it allowing the trapped air to rise.
- In the process the aggregate particles come close and form a dense packing, because of which the concrete settles, filling all the space in the forms. Normally the methods followed for compacting are:

1. Needle Vibrator: Undertaken with a poker or needle vibrator. This method is suited for deep and slender members.
2. Vibrating screeds: It is the preferred method for vibrating and compacting concrete flatwork for slabs up to 180 mm thick.
3. Tamping: Tamping with the screed board on thin ground slabs is an effective method of compaction.
4. Rodding: This method, with a purpose-made rodding tool or equivalent, is effective for compacting piers or where pokers cannot be inserted; especially where reinforcement is congested.

WHEN TO COMPACT?

- Compaction must be done as concrete the concrete is still plastic.
- Never let concrete dry out and stiffen, because then it would be too hard to compact.

For concrete to gain its optimum strength, it should be moist cured continuously for at least 21days.

WHEN TO CURE

- Curing is done just after finishing the concrete surface.
- When curing, leave the formwork in place to help reduce water loss.
- In hot weather (above 30°C) extra care may be required.
- It is important to note that water unfit to make concrete is also unfit to cure concrete.

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Protect green concrete from strong sun light, hot air or rain.

How to protect concrete from harsh nvironmental conditions:

- To avoid cracks forming in plastic, or fresh, concrete, it needs to be protected from direct sunlight and strong winds.
- If plastic shrinkage cracks are forming, then the concrete needs to be re-vibrated/reworked, finished again and shielded/protected from environment.

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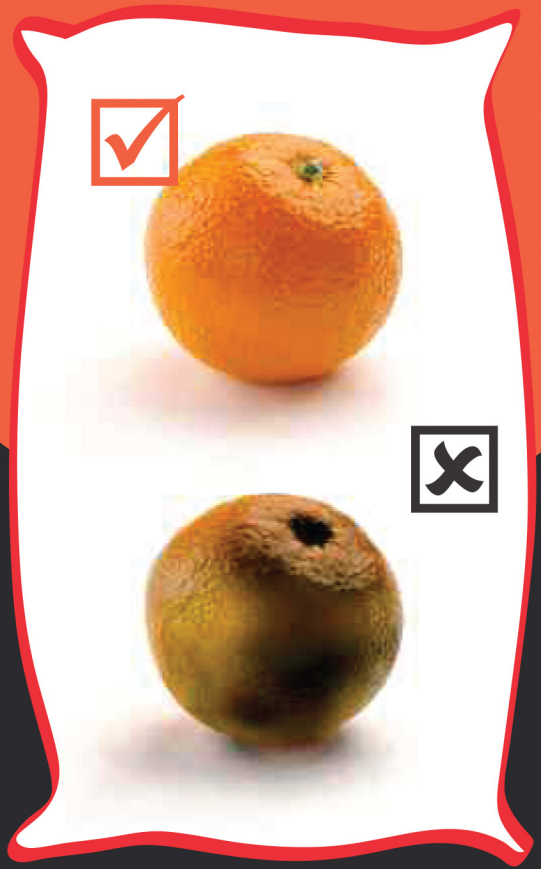
Prior to use, bricks should be soaked in water for six to eight hours

- To soak bricks correctly, they should be left in a water tank for six to eight hours.
- The bricks should be taken out of the water at least an hour before laying.



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The fresher the cement, the stronger the construction:

It is always better to use fresh cement for construction work, as it has been demonstrated that fresh cement has more binding strength than old cement. The following table explains the reduction of binding strength with age.

Age of Cement (Days)	Reduction in strength
15	3% - 6%
30	10% - 15%
60	15% - 20%
90	20% - 30%
180	30% - 45%

Note: Before purchasing cement always check the manufacturing date and physical condition of the cement bag.

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Some of the Concrete Mix ratio are as follows.

- M-15 - 1:2:4 (Cement : Sand : Aggregate)
- M-20 - 1:1.5:3 (Cement : Sand: Aggregate)
- M-25 - 1: 1: 2 (Cement : Sand : Aggregate)

Guide to determine how fresh the cement is

1st week (Jan, 2019)	Date: 01, 02, 03, 04, 05, 06
2nd week (Jan, 2019)	Date: 07, 08, 09, 10, 11, 12, 13
3rd week (Jan, 2019)	Date: 14, 15, 16, 17, 18, 19, 20
4th week (Jan, 2019)	Date: 21, 22, 23, 24, 25, 26, 27
5th week (Jan-Feb, 2019)	Date: 28, 29, 30, 31, 01, 02, 03
6th week (Feb, 2019)	Date: 04, 05, 06, 07, 08, 09, 10
7th week (Feb, 2019)	Date: 11, 12, 13, 14, 15, 16, 17
8th week (Feb, 2019)	Date: 18, 19, 20, 21, 22, 23, 24
9th week (Feb-Mar, 2019)	Date: 25, 26, 27, 28, 01, 02, 03
10th week (Mar, 2019)	Date: 04, 05, 06, 07, 08, 09, 10
11th week (Mar, 2019)	Date: 11, 12, 13, 14, 15, 16, 17
12th week (Mar, 2019)	Date: 18, 19, 20, 21, 22, 23, 24
13th week (Mar, 2019)	Date: 25, 26, 27, 28, 29, 30, 31
14th week (Apr, 2019)	Date: 01, 02, 03, 04, 05, 06, 07
15th week (Apr, 2019)	Date: 08, 09, 10, 11, 12, 13, 14
16th week (Apr, 2019)	Date: 15, 16, 17, 18, 19, 20, 21
17th week (Apr, 2019)	Date: 22, 23, 24, 25, 26, 27, 28
18th week (Apr-May, 2019)	Date: 29, 30, 01, 02, 03, 04, 05
19th week (May, 2019)	Date: 06, 07, 08, 09, 10, 11, 12
20th week (May, 2019)	Date: 13, 14, 15, 16, 17, 18, 19
21st week (May, 2019)	Date: 20, 21, 22, 23, 24, 25, 26
22nd week (May-Jun, 2019)	Date: 27, 28, 29, 30, 31, 01, 02
23rd week (Jun, 2019)	Date: 03, 04, 05, 06, 07, 08, 09
24th week (Jun, 2019)	Date: 10, 11, 12, 13, 14, 15, 16
25th week (Jun, 2017)	Date: 17, 18, 19, 20, 21, 22, 23
26th week (Jun, 2017)	Date: 24, 25, 26, 27, 28, 29, 30

27th week (Jul, 2019)	Date: 01, 02, 03, 04, 05, 06, 07
28th week (Jul, 2019)	Date: 08, 09, 10, 11, 12, 13, 14
29th week (Jul, 2019)	Date: 15, 16, 17, 18, 19, 20, 21
30th week (Jul, 2019)	Date: 22, 23, 24, 25, 26, 27, 28
31st week (Jul-Aug, 2019)	Date: 29, 30, 31, 01, 02, 03, 04
32nd week (Aug, 2019)	Date: 05, 06, 07, 08, 09, 10, 11
33rd week (Aug, 2019)	Date: 12, 13, 14, 15, 16, 17, 18
34th week (Aug, 2019)	Date: 19, 20, 21, 22, 23, 24, 25
35th week (Aug-Sep, 2019)	Date: 26, 27, 28, 29, 30, 31, 01
36th week (Sep, 2019)	Date: 02, 03, 04, 05, 06, 07, 08
37th week (Sep, 2019)	Date: 09, 10, 11, 12, 13, 14, 15
38th week (Sep, 2019)	Date: 16, 17, 18, 19, 20, 21, 22
39th week (Sep-Oct, 2019)	Date: 23, 24, 25, 26, 27, 28, 29
40th week (Oct, 2019)	Date: 30, 01, 02, 03, 04, 05, 06
41st week (Oct, 2019)	Date: 07, 08, 09, 10, 11, 12, 13
42nd week (Oct, 2019)	Date: 14, 15, 16, 17, 18, 19, 20
43rd week (Oct, 2019)	Date: 21, 22, 23, 24, 25, 26, 27
44th week (Oct-Nov, 2019)	Date: 28, 29, 30, 31, 01, 02, 03
45th week (Nov, 2019)	Date: 04, 05, 06, 07, 08, 09, 10
46th week (Nov, 2019)	Date: 11, 12, 13, 14, 15, 16, 17
47th week (Nov, 2019)	Date: 18, 19, 20, 21, 22, 23, 24
48th week (Nov-Dec, 2019)	Date: 25, 26, 27, 28, 29, 30, 01
49th week (Dec, 2019)	Date: 02, 03, 04, 05, 06, 07, 08
50th week (Dec, 2019)	Date: 09, 10, 11, 12, 13, 14, 15
51st week (Dec, 2019)	Date: 16, 17, 18, 19, 20, 21, 22
52nd week (Dec, 2019)	Date: 23, 24, 25, 26, 27, 28, 29