SITE ENGINEER POCKET DATA

WHAT IS IN THE NOTES?

- This notes contains all the necessary data required at site for the execution work.

This notes can be very helpful for the site engineers, as it includes notes for unit conversion , calculation for steel , concrete and measures taken before and after concreting, plastering and shuttering.

It also includes the equipments used at site for the smooth running of the project

UNIT CONVERSION

- 1 feet - 0.3048 m
- 1 m - 3.28 ft
- 1 Sqm - 10.76Sqft
- 1 Cum - 35.28 Cuft
- 1 acre – 43560 Sqft
- 1 cent - 435.6 Sqft
- 1 hectare - 2.47 acre
- 1 acre – 100 cent - 4046.724 Sqm
- 1 ground – 2400 Sqft
- 1 unit - 100 cu.ft-2.83 Cum
- 1 square -100 Sqft

CONVERSION TABLE :

- 1 RM =3.28 Rft
- 1 Sqm =10.76 Sft
- 1 Cum =35.32 Cft
- 1 Inch =2.54 cm
- 1 sqft =0.09Sqm
- 1 Acre= 0.04 Hectare
- 1 Hectare= 2.47 Acres
- 1 Cft =0.028 Cum
- 1 Feet =12.00 Inch
- 1 Feet =0.305 M
- 1 Cum =1000.00 Litre

STANDARD CONVERSION FACTORD

- INCH = 25.4 MILLIMETRE
- FOOT = 0.3048 METRE
- YARD = 0.9144 METRE
- MILE = 1.6093 KILOMETER
- ACRE = 0.4047 HECTARE
- POUND = 0.4536 KILOGRAM
- DEGREE FARENHEIT X 5/9 – 32 =

DEGREE CELSIUS MILLIMETRE= 0.0394

- INCHMETRE = 3.2808

UNIT WEIGHT

- Concrete 25 kN/m3
- Brick 19 kN/m3
- Steel 7850 Kg/m3
- Water 1000 Lt/m3
- Cement 1440 Kg/m3
- 1Gallon 4.81 Litres
- Link 8" = 200mm
- 1 Hectare 2.471 acr(10000m2)
- 1 Acr 4046.82m2 = 100 cent

AS PER INDIAN STANDARD

DIFFERENT TYPES OF CONCRETE GRADE

Concrete Grade		Mix Ratio (cement : sand : aggregates)
M5	-	1:5:10
M7.5	-	1:4:8
M10	-	1:3:6
M15	-	1:2:4
M20	-	1:1.5:3
M25	-	1:1:2

After M-25 we refer IS 10262

DESIGN MIX : M15

- M15 (1 : 2 :4)
- Cement : 316 Kg/ M3
- 20 mm Aggregate : 1320 Kg/ M3
- River sand : 638 Kg/ M3
- Total water : 140 Kg/ M3
- No. of bags = 7 bags

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DESIGN MIX : M 20

- M20 (1:1.5: 3)
- Cement : 403.2 Kg/ M3
- 20 mm Aggregate : 1260 Kg/ M3
- River sand : 609 Kg/ M3
- Total water : 180 Kg/ M3
- No. of bags = 9 bags

DESIGN MIX : M 25

- M25 (1 : 1 : 2)
- Cement : 554.4 Kg/ M3
- 20 mm Aggregate :1155 Kg/ M3
- River sand : 558.25 Kg/ M3
- Total water : 250 Kg/ M3
- No. of bags = 9 bags

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WEIGHT OF ROD PER METER

LENGTH :

DIA WEIGHT PER METER

- 6mm = 0.222Kg
- 8mm = 0.395 Kg
- 10mm = 0.616 Kg
- 12mm = 0.888 Kg
- 16mm = 1.578 Kg
- 20mm = 2.466 Kg
- 25mm = 3.853 Kg
- 32mm = 6.313 Kg
- 40mm = 9.865 Kg

(Weight= D*D/162)

CLEAR COVER TO MAIN REINFORCEMENT :

- FOOTINGS : 50 mm
- RAFT FOUNDATION.TOP : 50 mm
- RAFT FOUNDATION. BOTTOM /SIDES : 75 mm
- STRAP BEAM : 50 mm
- GRADE SLAB : 20 mm
- COLUMN : 40 mm
- SHEAR WALL : 25 mm
- BEAMS : 25 mm
- SLABS : 15 mm
- FLAT SLAB : 20 mm
- STAIRCASE : 15 mm
- RET. WALL : 20/ 25 mm on earth
- RETAINING STRUCTURES : 20/30mm

1 M LENGTH STEEL ROD & ITS VOLUME

- V = (Pi/4) * Dia X Dia * L

  = (3.14/4) X D X D X 1 (for 1 m length)

Density of Steel = 7850 kg / cub meter

- Weight =Volume X Density

(3.14/4) X D X D X1 X 7850 (if D is in mm), So

(3.14/4) X D X D X 1 X 7850) / (1000 X 1000)

, =D*D/162.27

RATIO IS 1:1.5:3

Calculation

- Then sum of ratio is 1+1.5+3=5.5 and
- The total volume for using mix=1.54 m3
- Then cement required=

  1/5.5*1.54=0.308m3*1440=443.5 kg.

  (9bag)
- Sand required=1.5/5.5*1.54=0.462m3
- Aggregate required=3/5.5*1.54=0.843m3
- The standard volume of dry mix mortar=1.54..

can check it in IS code also.

MATERIAL CALCULATION

CEMENT IN BAGS

- Pcc 1:5:10 =1440/5*0.45

  =129.60 kg / 2.59 Bags

- Pcc 1:4:8(m 7.5) =1440/4*0.45

  =162.00kg / 3.24 Bags

- Pcc 1:2:4(m 15) =1440/2*0.45

  =324.00kg / 6.48 Bags

- Pcc 1:3:6(m 10) =1440/3*0.45

  = 216.00kg /4.32 Bags

- Rcc 1:2:4(m 15) =144/2*0.45

  =324.00kg / 6.48 bags

- Rcc 1:1.5:3(m 20) =1440/1.5*0.45

  =32.00kg / 8.64 Bags.

- Rcc 1:1:2(m 25) =370.00kg / 7.40 Bags

SAND CALCULATION (CFT) :

- Any Concrete Work(PCC, RCC)

  0.45*35.315= 20.00

- Damp Proof CourseCM `1:3, 20mm

  thick =1.00

- 2"T Precast slab M15 =1.00

- 3"T Precast slab M15 =1.50

- SS Masonry in CM 1:7 =15.00

- Brick Work in CM 1:6 =15.00

- Brick Work in CM 1:4,115mm T =2.00

- Grano Flooring in CC 1:1.5:3 =1.00

- Plastering in CM 1:3, 12mmT=1.00
- Wall Plastering CM 1:4, 12mmT =1.00
- Laying Pressed Tiles over a CM 1:4, 20mmT =1.00
- Ceramic Tiles, Marble, Granite, Cuddapah slab CM 1:4, 20mmT =1.00
- Janathacem/100 Sft 1.50 Kg
- Enamel Paint/100 Sft - 2 Coats 1.25 Litre
- Wall Putty/100 Sft 10.00 Kg
- Plaster of Paris/100 Sft 25.00 Kg

- Distemper/100 Sft 2.00 Kg
- Cement Primer 0.60 Litre 0.40 Litre
- Weathering Course Lime 12.50 Kg Brick bats 32.00 Kg
- Providing Sand Gravel Mix-Cum Sand 20.00 Cft Gravel 40.00 Cft
- WBM - 75mm tk -1st Layer - 10 Sqm Metal(60-40 mm) 35.00 Cft Gravel =10.00 Cft
- Pressed Tiles - Sqm 20.00 Nos
- Hollow Block - 200mmT =14.00 Nos

BRICK

- Water absorption 12 to 15%
- Compressive strength

  = 36KN/cm2
- 230mm Wall/m3 = 460 Bricks + 20Cft Sand +

  66Kg Cement
- 1:7/m3 = Size 95 + Soiling 8 Cft +60.5 Kg

  Current = 1000 Watts = 1 Unit.
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- 1 cubic meter contains 500 bricks The Standard size of the 1st class brick is 190mmx 90mm x90mm and motor joint should be 10mm thick So brick with motor=200 x 100 x 100.Volume of
- 1st class brick = 0.19 x 0.09 X 0.09 =0.001539cu.m
- Volume of 1st class brick with motor =0.2 x 0.1 x0.1=0.002cu.mNo. on bricks per 1cu.m= 1/volume of1st class brick with motor=1/0.002= 500 no's of bricks

Physical Test on Cement

Fineness Test

The degree of fineness of cement is the measure of the mean size of the grains in it.

Sieve Method:

100 g of cement sample is taken and air-set lumps, if any, in the sample are broken with fingers. The sample is placed on a 90 micron sieve and continuously sieved for 15 minutes . The result should pass 90 micro sieve by 90% and retain by 10% of the weight.

COLOUR TEST

The colour of the cement should be greyish and should be free from lumps.

Physical Test on Cement

Compressive Strength:

Compressive strength is the basic data required for mix design. By this test, the quality and the quantity of concrete can be controlled and the degree of adulteration can be checked.

Cube Method:

Before concreting of any member at site concrete cube should be prepared according to the specification given . At least 3 cubes should be prepared to check after 14,21 and 28 days.

The compressive strength is calculated from the crushing load divided by the average area over which the load is applied.

CEMENT BAG SPECIFICATION

Use no hooks

Grade of cement

IS CODE

Type of cement

Batch unit number

MRP of Bag

CHECKLIST

(Shuttering)

- Is adequate quantity of shuttering material available.
- Is the dimensional accuracy of shuttering material correct.
- Has the shuttering material been properly aligned using appropriate equipment.

CHECKLIST

(Reinforcement)

- Is the area prepared for starting reinforcement (shuttering complete, cleaned and oiled).
- Are the results of bars available at site before starting the fabrication work.
- Are the required tools available at site to ensure correct work.

CHECKLIST

(Concreting)

- Are the required number of cement bags available on site.
- Have the vibrators been checked before start of the concrete.
- Is the necessary shuttering and reinforcement complete and in place.

THUMBRULE(Approx.)

ITEM	QUANTITY PER SQFT
Plain cement concrete	=0.015
Reinforced Cement concrete	=0.024
Brickwork	=0.014
Plaster	
6mm	=0.041
12mm	=0.08
15mm	=0.11
Tiles	=0.095

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THUMBRULE(Approx.)

ITEM	QUANTITY PER SQFT
Paint	
White wash	=0.03
Putty	=0.04
Paint	=0.02
Soil filling	=0.044
Steel	=2.33
Shuttering	=0.18

De-Shuttering (stripping time)

#	Types of Formwork	Formwork removal time after casting of Concrete
1	Vertical Formwork of Column, beam, and wall	16 Hours to 24 hours
2	Forms removal for Slab (Props has to be fixed immediately after removal of forms)	3 days
3	Forms removal for Beams (Props has to be fixed immediately after removal of forms)	7 days
4	**Props removal for slab**	
	Span length up to 4.5m	7 days
	Span length beyond 4.5m	14 days
5	**Props removal for beams and arches**	
	Span length up to 6m	14 Days
	Span length beyond 6m	21 Days

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Points to remember
(During Concreting)

- Total number of bags required for the site execution should be available.
- The concrete mix should be prepared according to the specification provided in the drawing.
- The placement of the concrete should be on metal sheet or on sand.
- It should be placed minimum from 800mm to 1500mm distance

Points to remember (During Brickwork)

- Bricks should be checked according to the type and classification provided in specification.
- The bricks when transported on site should be subjected to water before execution.
- The test result for the bricks should be available at site office.
- During brickwork the alignment should be checked with line dori and plumb bob.

Points to remember

(During Plaster)

- The wall where plaster is to be done should be properly cleaned and watered before execution.
- Paste of cement slurry should be spread before plastering.
- Before plastering tippy should be made to achieve a levelled surface.
- Thickness for rough surface is taken as 15mm and thickness for smooth surface is taken as 12mm.(this can vary)

Points to remember

(During Shuttering)

- The alignment should be checked before concreting.
- Before concreting , the shuttering should be stable and should not remove during concreting.
- The ply used for shuttering should be cleaned and oiled before use.
- Removal of shuttering should be as per the specification given in IS 456:2000 in stripping time.

Test results required before execution

- Test for Concrete
  1. Compressive strength test.
  2. Workability of Concrete

- Test for Sand
  1. Bulking of sand.
  2. Grading of sand(IS383)

- Test for Aggregate
  1. Impact value test.
  2. Crushing strength test.
  3. Abrasion value test.

Test results required before execution

- Test for Bricks.
  1. Absorption value test
  2. Impact test.
  3. Efflorescence test

- Test for Pile foundation
  1. Pile load test.

- Test for Steel
  1. Tensile strength test.
  2. Basic properties .
  3. Bend test.

SAFETY MEASURES

- Wear sturdy work gloves, long sleeves, and full length trousers to protect your hands, arms, and legs.
- Wear rubber boots when placing and handling concrete for slabs and flatwork, because you may sometimes have to stand in the wet mix to spread and screed the concrete.
- Make sure the boots are high enough to prevent concrete from getting inside them.

SAFETY MEASURES

- To protect your eyes from cement dust and from splattered mortar or concrete, wear safety glasses or goggles.

- Since masonry involves heavy lifting, be careful to avoid back strain and injury—always bend your knees, keep your back straight, and lift with your legs.

SAFETY MEASURES

- Small, shallow concrete footings can sometimes be formed by earth trenches if the soil is stable, but most concrete work requires building forms to shape and hold the mix until it hardens. Forms for concrete must be strong, tightly fitted, and rigidly

  constructed..

- The deeper the concrete, the greater the pressure it will exert on the formwork, so don’t be afraid to use an extra stake or two to help ensure that forms will not bulge or bow out of shape during the pour.

SAFETY MEASURES

- Drive supporting stakes slightly below the height of the string so they won't interfere with leveling or finishing the concrete surface.
- On residential projects, it is more common to use wheelbarrows or buggies to move the concrete from the mixer to the forms. You can build ramps and runways over the forms to keep them from bumping the boards or displacing the reinforcing steel out of place..

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When visiting a site a site engineer should have

- The drawing of the respected project where all the specification is given for execution.
- The estimation sheet in which

the amount of work to be done is specified.

- A work register to note the amount of work done on that date.
- Hinderence register.
- Inch tape and pen.

AREA AND VOLUME

- Volume of rectangle= L*B*H
- Area of rectangle = L*B
- Volume of trapezoidal=

  H/3 (A1+A2+($\sqrt{}$A1 x A2).
- Volume = cum
- Area = sqm
- NO. Of items= enumerated Qty.
- Area of circular= π*r*r
- Volume of circular=$\pi r^2 h$

Labour Required for Different work

- Extracts from the report on productivity projects in building industries by National Building organization are given below.

- Earthwork per 28.30 cum

Excavation in foundation , trenches etc , in ordinary soil including disposal up to 30m and lift of 1.5 m-5 Beldar and 4 Mazdoor.

- Cement Concrete work per 2.83 cum

Laying Cement Concrete- 2 Beldar,# Mazdoor,3/4 Bhisti and ¼ Mason.

Labour Required for Different work

- R.C.C work-

Laying reinforced concrete- 3 Beldar,3 Mazdoor, 1 Bhisti, ½ Mason

- Brickwork per 2.83 cum

First class brick work in 1:4 cement mortar in superstructure partition walls, junctions of roof , parapet walls- 2.5 Masons,4.5 Mazdoor and 1 Bhisti.

- Finishing

plastering- 3 Masons, 3 Mazdoor and 1 bhisti can plaster 40sqm per day.

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FORMAT FOR ESTIMATION SHEET

SR.NO	DESCRIPTION/ITEM	NO.OF.ITEM	LENGTH	WIDTH	HEIGTH	TOTAL	UNIT	REMARK

FORMAT FOR Bill Of Quantity

SR.NO	CODE NO	ITEM	QUANTITY	UNIT	RATE	AMOUNT	REMARK

REINFORCEMENT DETAILS

- FE-250.

- Where FE stands for iron and the numeric value represents the yield strength of the steel.
- Where now a days TMT are more used in construction which stands for Thermo Mechanically Treated bars.

REINFORCEMENT DETAILS

- FE-415

- Where FE stands for iron and the numeric value represents the yield strength of the steel.
- Where now a days TMT are more used in construction which stands for Thermo Mechanically Treated bars.

REINFORCEMENT DETAILS

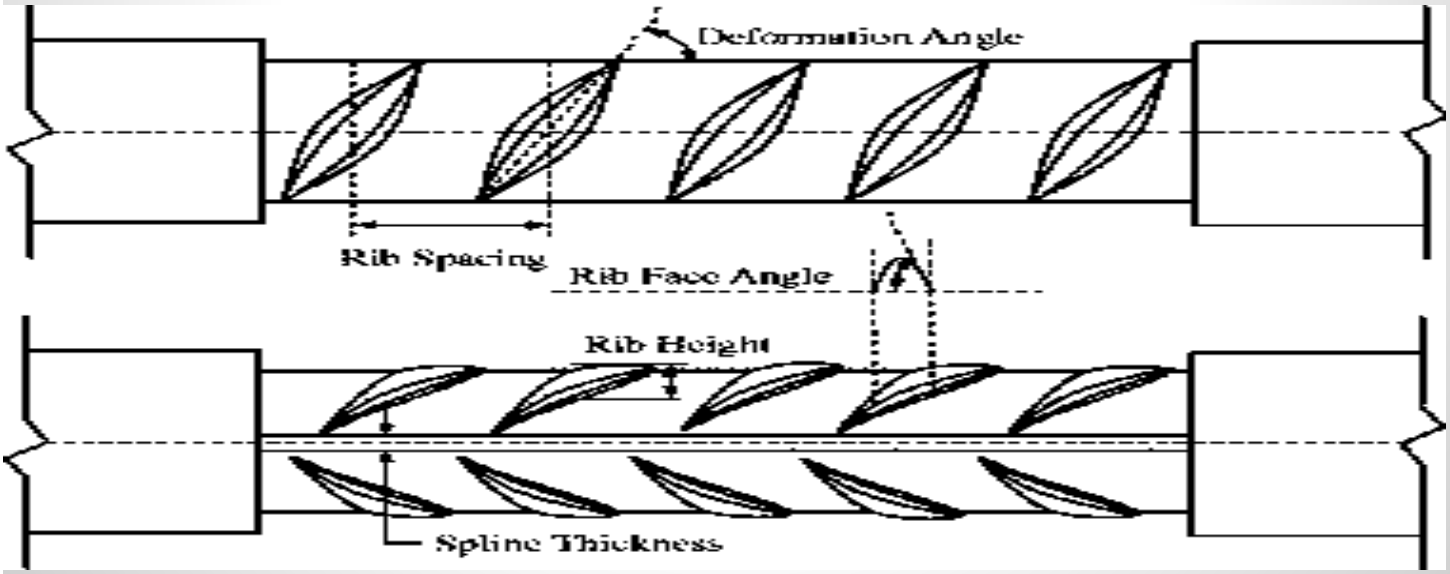
- FE-500

- Where FE stands for iron and the numeric value represents the yield strength of the steel.
- Where now a days TMT are more used in construction which stands for Thermo Mechanically Treated bars.

REINFORCEMENT DETAILS

- It is determined with the help of rib, spline and spacing which

helps the concrete to set and hold the reinforcement in position .



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CONTRACTORS PROFIT AND OVERHEAD

- Generally the Contractor's charges CP & OH on the account of work done and number of items installed as per the requirement.
- Generally CP&OH is taken to be 15% of the total amount.
- Where CP is 7.5%
- And OH is 7.5%
- In which OH cost contains:-
- 1.Location
- 2.Site office
- 3.Lab testing
- 4.Cement storage
- 5. Staff salary
- 6. transportation

Dry coefficient for Concrete

- It is because of the compressibility index of these materials.
- Where cement has 0, sand has 33%to34%,and aggregate has 20% compressibility index.

- Dry volume = wet volume (100/100+54/100)
- Dry volume = wet volume (1+0.54)
- Dry volume = wet volume × 1.54
- if wet volume of concrete = 1 cum
- Than dry volume will be 1.54 cum

Dry coefficient for Mortar

- It is because of the compressibility index of these materials.
- Where cement has 0 and sand has 33%to34%, compressibility index.

- Dry volume = wet volume (100/100+33/100)
- Dry volume = wet volume (1+0.33)
- Dry volume = wet volume × 1.33
- if wet volume of mortar = 1 cum
- Than dry volume will be 1.33 cum

Terminologies

- **Segregation** of **concrete** is the separation of **cement** paste and aggregates of **concrete** from each other.

1.During handling and placement

2.Due to over-vibration or compaction of concrete

3.Cement paste comes to the top and aggregates settles at the bottom

Terminologies

- **Bleeding** in fresh **concrete** refers to the process where free water in the mix is pushed upward to the surface due to the settlement of heavier solid particles such as **cement** and water

1.Due to over-vibration or compaction of concrete

2.Cement paste comes to the top and aggregates settles at the bottom

TYPES OF CEMENT

Many types of cement are available in markets with different compositions and for use in different environment.

1. **Ordinary portland cement**

   This type of cement use in construction where there is no exposure to sulphate in the soil or ground water.

2.Rapid hardening cement

Its 3 day strength is same as 7 days strength of OPC.

3**. Low heat cement**

Reduce and delay the heat of hydration.

TYPES OF CEMENT

4. Sulphate resisting cement

Its strength in early days is less and hence it required longer curing period. It proves to be economical as slag

5.Pozzolanic cement

This cement has higher resistance to chemical agencies and to sea water because of absence of lime.

6. Coloured cement

the cement of desired colour may be obtained by mixing mineral pigments with ordinary cement.

TYPES OF CEMENT

7. **Expansive cement**

This type of cement is produced by adding an expanding medium and a stabilizing agent to the ordinary cement.It is used for the construction of water retaining structures.

8.High alumina cement

This cement is produced by adding clinkers formed by calcining bauxite and lime. It evolves great during setting

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PLASTERING DEFECTS

1. Bond failure between plasterwork and background.
2. Bond failure between finish plaster and sand/cement undercoat
3. Dampness within the plaster
4. Crazing/dry-out of finish plaster
5. Cracking
6. Surface dampness

PLASTERING REMEDIES

1. When movement has ceased or the residual moisture has been removed, the affected plasterwork including any suspect areas should be removed. The background should be prepared and a coat of Thistle Bond-it applied prior to the application of a suitable grade of plaster.
2. The plasterwork should be stripped off and any dust removed from the undercoat surface prior to re-plastering

PLASTERING REMEDIES

1. The affected plasterwork should be stripped off. Re-plastering can take place once the background is thoroughly dry after first applying Thistle Bond.
2. Localized cracks due to movement can be ‘cut out’ and filled once movement has ceased. Otherwise, the recommendations given for bond failures should be followed.
3. The source of the problem must be identified and corrected and the plasterwork allowed to dry out. If the plasterwork fails to develop adequate strength, it will need to be removed

CLASSIFICATION OF BRICKS

Clay bricks are classified as first class, second class, third class and fourth class based on their physical and mechanical properties.

First Class Bricks

1. These are thoroughly burnt and are of deep red, cherry or copper colour.

2. The surface should be smooth and rectangular, with parallel, sharp and straight edges and square corners.

CLASSIFICATION OF BRICKS

3. These should be free from flaws, cracks and stones.

4. These should have uniform texture.

5. No impression should be left on the brick when a scratch is made by a finger nail.

6. The fractured surface of the brick should not show lumps of lime.

7. A metallic or ringing sound should come when two bricks are struck against each other.

CLASSIFICATION OF BRICKS

Second Class Bricks are supposed to have the same requirements as the first class ones except that

1. Small cracks and distortions are permitted.
2. A little higher water absorption of about 16-20% of its dry weight is allowed.

3. The crushing strength should not be less than 7.0 N/mm^2.

Uses: Second class bricks are recommended for all important or unimportant hidden masonry works and centering of reinforced brick and (RCC) structures.

CLASSIFICATION OF BRICKS

Third Class Bricks are under burnt. They are soft and light-coloured producing a dull sound when struck against each other. Water absorption is about 25 per cent of dry weight.

Uses : It is used for building temporary structures.

Fourth Class Bricks are over burnt and badly distorted in shape and size and are brittle in nature. Uses: The ballast of such bricks is used for foundation and floors in lime concrete and road metal.

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METHOD OF HAND MIXING

Carrying out hand mixing of concrete requires special skills and care during the process for quality control of fresh concrete. The precautions and the correct way of performing hand mixing of concrete is to undergo the mixing process as recommended by the standard procedures. Concrete is mixed by any two methods, based on requirement as per quality and quantity of concrete required. Normally for mass concrete, where good quality of concrete is required, mechanical mixer is used

METHOD OF HAND MIXING

Mixing by hand is employed only to specific cases where quality control is not of much importance and quantity of concrete required is less. Stone aggregate is washed with water to remove dirt, dust or any other foreign material before mixing.

The main purpose of mixing the concrete is to finally obtain a uniform mixture that shows uniformity in terms of color and consistency.

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PROCEDURE OF HAND MIXING

Hand mixing should be done on a smooth, clean and water tight platform of suitable size in the following manner:

Measured quantity of sand is spread evenly.

The required quantity of cement is dumped on the sand and spread evenly.

The sand and cement is then mixed intimately with spade, turning the mixture over and over again until it is of even color throughout and free from streaks.

The sand cement mixture is then spread out and measured quantity

PROCEDURE OF HAND MIXING

of coarse aggregate is spread on its top.

Alternatively, the measured quantity of coarse aggregate is spread out and the sand cement mixture is then spread on its top.

The whole mass should be mixed at least three times by shoveling and turning over by twist from center to side, then back to the center and again to the sides.

A hollow is made in the middle of the mixed pile.

Three quarters of the total quantity of water required should be added while the materials are turned in towards the center with spades. The remaining water is added by a

PROCEDURE OF HAND MIXING

water-can fitted with rose head, slowly turning the whole mixture over and over again until a uniform color and consistency is obtained throughout the pile.

5 percent extra cement shall be added than the specified for machine mixing, when hand mix cement concrete is produced.

The required PPEs (Personal Protective Equipment) shall be worn by the labors and masons while mixing and handling the concrete.

The mixing platform should be washed at the end of the day.

PRECAUTION DURING HAND MIXING

Certain tips, measures that must be taken care while mixing concrete by hand is mentioned below:

The Hand Mixing procedures have to be carried out only for small concrete works. Large works will ask for large quantity of concrete at a time, for which we must use either a machine mixer or ready mix concrete.

The hand mixing must be employed only for works that will give adequate interval time for mixing between the work. This means we must not mix large quantities very earlier for a work that is going to start later.

PRECAUTION DURING HAND MIXING

The mixing procedure have to be conducted on a water tight platform. This platform have to be impervious. This can be either a concrete platform or a brick floor.

The floor must have the space to take one bag of cement at a time and their respective materials (water + aggregate).

Initially, the measured quantities of cement and fine aggregate is mixed properly over the watertight platform. The mixing is continued till a uniform mixture is obtained.

The coarse aggregate has to be placed over this bed of uniform mixture. An inappropriate order of

PRECAUTION DURING HAND MIXING

addition of material must not be followed.

The addition of water must be done in intervals and not in a single stretch.

The whole mixing must be done neatly and uniformly without a hurry.

A good and clean shovel should be used for the mixing procedure.

During hand mixing, it is recommended to avoid large buckets for measurement. Use of large buckets will end up having a large heap that is difficult to be mixed by hand. In some cases, the large heap is divided into two large

PRECAUTION DURING HAND MIXING

heaps and performed individually. This can be only carried out by one will proper skill and experience.

Every time after the use, the worming space have to cleaned and made free from any debris.

The main issue faced in hand mixing is the addition of too much water that required. This must be avoided.

The workers carrying out the concrete mixing are asked to use masks so as not to inhale the powder, which can cause serious issues as time passes.

For inside concrete works, avoid the hand mixing procedure in the outside or direct sun. This increase

PRECAUTION DURING HAND MIXING

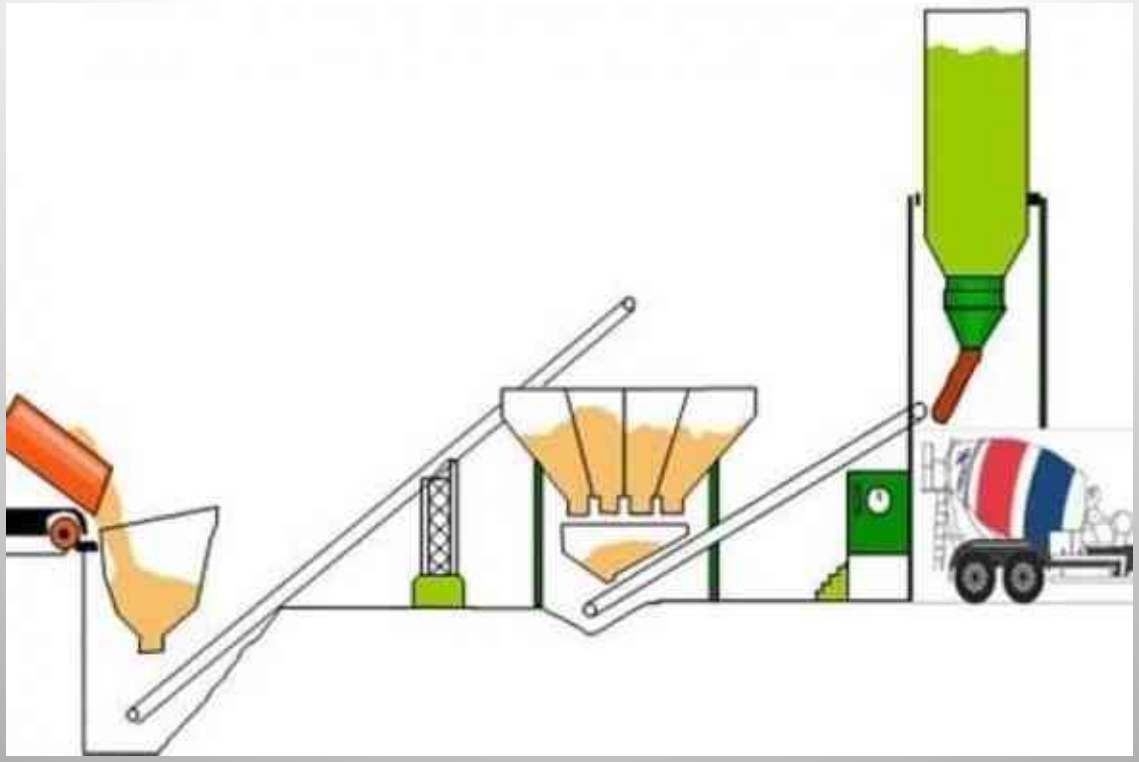
in temperature will evaporate the water content, hence making the mixture dry.

Over mixing of the concrete mixture have to be avoided. Once the required amount of mixing is performed, keep it idol and mixing in small quantities during the time of placing.

TYPES OF READY MIX CONCRETE PLANTS

Following are the different types of ready mix concrete plants and their mixing actions:

- Dry batch concrete plant
- Wet batch concrete plant
- Half-wet batch concrete plant
- Combination batch concrete plant



CONSTRUCTION TOOL LIST

Some important construction tools and their uses are listed below:

Brick Hammer

Brick hammer is used to cut the bricks and also used to push the bricks if they come out of the course line.

CONSTRUCTION TOOL LIST

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Brick Hammer

Brick hammer is used to cut the bricks and also used to push the bricks if they come out of the course line.

CONSTRUCTION TOOL LIST

Chisel

Chisel is generally used in wood work and this must be useful to remove the concrete bumps or excess concrete in hardened surface.

CONSTRUCTION TOOL LIST

Circular Saw

Circular saw used to cut the wood boards, frames etc. It is used when accurate cutting is required in less time. It is safer than hand saw.

CONSTRUCTION TOOL LIST

Concrete Mixer

Concrete mixer is machine which mixes the ingredients water, fine aggregate, coarse aggregate and cement to deliver the perfectly mixed concrete

CONSTRUCTION TOOL LIST

Crowbar

Crowbar is used for digging the ground and to remove the roots of trees in the ground, nails etc.

CONSTRUCTION TOOL LIST

Digging Bar

Digging bar is solid metal rod with pin shape at the bottom. It is also used to dig the hard surfaces of ground.

CONSTRUCTION TOOL LIST

Float

Float is made of wood which is used to smoothen the plastered concrete surface. It contains handle on its top and smooth wooden surface on its bottom

CONSTRUCTION TOOL LIST

Head Pan

Head pan is made of iron which is used to lift the excavated soil or cement or concrete to the working site etc. it is more commonly used in construction sites.

CONSTRUCTION TOOL LIST

Hoe

Hoe is also used to excavate the soil but in this case the metal plate is provided with acute angle to the wooden handle.

CONSTRUCTION TOOL LIST

Plumb Bob

Plumb bob is used to check the verticality of structures. It contains a solid metal bob connected to the end of a thread. It is also used inn surveying to level the instrument position.

CONSTRUCTION TOOL LIST

Plumb Rule

Plumb rule is used to check the vertical line of wall whether it is perfect vertical or not. It contains a straight wood board with uniform edges. On its center a groove is provided in which plumb bob is situated. When the rule is placed vertically with the wall the plumb bob should be in the groove line otherwise the wall will not be vertical.

CONSTRUCTION TOOL LIST

Earth Rammer

After the excavation of ground, the lower surface may be uneven. To level the surface earth rammer is used. It contains big square shaped block at its end with which the ground is leveled.

CONSTRUCTION TOOL LIST

Trowel

Trowel is used to lift and apply the cement mortar in small quantities. It is made of steel and wooden handle is provided for holding. The ends of trowel may be pointed or bull nosed.

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CONSTRUCTION TOOL LIST

Vibrator

Vibrator is used to compact the concrete by this the air gaps are filled with water and workability varies without adding water to it.

CONSTRUCTION TOOL LIST

Putty Knife

Putty knife is used level the putty finishing and also used to reduce the thickness of finish when it is more thick.

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