

**SAMANTA CHANDRASEKHAR INSTITUTE
OF TECHNOLOGY AND MANAGEMENT**
SEMILIGUDA - 764 036



Department CIVIL ENg

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INSTITUTE ROLL NO. F19030001013 SEM 6th

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SUBJECT construction workshop Practice & detailing M.S. Project



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SHEET NO. _____

Sl No	Experiment	Page	Date of Experiment	Date of Submission	Remarks
01	Study of tools required for construction of masonry	1 to 6		25/04/22 5/5	Manisha 05/04/2022
02	Bar bending schedule for reinforced concrete Beam.	7 to 9		19/04/22 5/5	Manisha 19/04/2022
03	Bar Bending Schedule for slab	10 to 15		10/05/22 5/5	Manisha 10/05/2022
04	Definition of project Management	16 to 19		24/05/22 5/5	Manisha 24/05/2022
				Comprehensive Viva 5/5 Evaluated	
					Manisha 16/7/2022



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SHEET NO. 1

Study of Tools Required for construction of Masonry:-

Masonry work requires tools for various purposes i.e for handling of mortar, for the dressing of stone, for cutting of bricks to get required shape etc. As it goes with traditions in existence since the days of ancient Indian and Egypt. Masonry deals with some common elements as crushed stones from the earth and simple metal tools.

Common Masonry Tools used in Masonry construction

01. Trowel
02. corner trowel
03. outside corner trowel
04. inside corner trowel
05. setting out square or masonary square
06. plumb rule and Bob
07. spirit level
08. lime and pink
09. water level
10. pointing rods
11. spades (pharandas)
12. mowfar pan / ghamela
13. jointers



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common masonry tools used in masonry construction.

01. Trowel: The basic Masonary trowel is made up of stainless steel with a plastic/wooden handle the ends of trowels may be full nosed or pointed this is used to lift and spread mortar on joints during masonry construction. there are different kinds and sizes of trowels used in masonry work.

02. corner trowel: It is one of the common modifications of the basic trowel. it is used for shaping corners of the wall. they are two types of corner trowels.

outside corner trowel:

These are different designs of outside corner trowels but the one shown at left side with cheefer blanges is the most common. these outside corner trowels can have a sharp 90-degree angle or a full nose (grounded) edge.

Inside corner trowel:

These are more common than the outside corner trowels just because corner and is used on the outside corners. they have standard features comparable to an outside corner tool but also have -



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Adjustable models that can get wider or narrower depending on the angle of the corners.

Setting out square or Masonry square

It is used to set out right angles of the corners of masonry wall. This is very important and basic tool used in masonry work. This tool has "L" shape. It is made of steel having each arm about 0.5m long.

plumb rule and Bob

The basic masonry tool is used to check the vertically of walls. It consists of a string tied to a weight wood board with uniform edges called plumb rule. On its centre a groove is provided in which plumb bob is placed. When the rule is placed vertically with the wall, the plumb bob must be in the groove line indicating the perfect vertical wall. If the plumb bob does not fall on the groove line, the wall will not be vertical.

Spiral level

It is used to check the horizontally and vertically of the surfaces. Spiral level is made of hard plastic or wood with bubble tube in the middle the bubble tube is partially filled with alcohol in such a way



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That an air bubble be remained to if the spirit level is placed on surface of masonry wall and bubble is checked the surface be called leveled when the bubble in the tube surfaces at middle of tube.

Lime and pins:

It is used to maintain the alignment of the working progress. lime and pins consist of string whose ends are connected with two solid metal rods with pin points it is used to level line and the alignment of brick course while brick laying in brick masonry work.

Water level:

It is used to transfer and check level. It is a simple tool to measure the level at two different points. to measure it is a tool that works on the principle that water always seeks its own level. It consists of flexible tube with liquid. and the liquid at both ends will be at the same level whether you are holding them together or spreading them a hundred feet apart.

Beeing Rods:

They are used for levelling from two fixed points in surveying. It consists of an upright pole having a horizontal board as its top forming a "T"



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shape rods. Boiling rods are made in set of three rods and may consists of three "T" shaped rods. each of equal shape and size. or two rods identical to each other and a third one consisting of longer rod with a movable or detachable "T" piece third one is called trareter or travelling rod.

Spades (phavadas)

They are used to mix Mortar and also used to place cement Mortar. concrete in head pan. Spades is also used to dig the soil for foundation trenches etc. It consists at metal plate at the end of long wooden handle.

Mortar pan (ghameja):-

Mortar pan is commonly used in construction sites and is made of iron or plastic. It is a vessel made of rigid plastic or steel used to hold or carry Sand, cement Mortar and concrete. It is also used to mix mortar and to lift mortar on working site to use a mortar pan. fill it with a quantity of mortar i.e sand cement mortar etc. that you are comfortable carrying



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Jointer: A jointer in masonry construction is a tool in the form of a flattening iron or a striking tool used to finish the horizontal or the vertical mortar joints. A jointer or bricks jointer is a hand tool designed to impress grooves into recently filled mortar joints at the stage when they are starting to set. Using a brick jointer helps to improve and reduce impact and the lifespan of the mortar. Jointer is used to reduce to any tool which can shape the mortar between bricks.

Manisha
05/04/2022

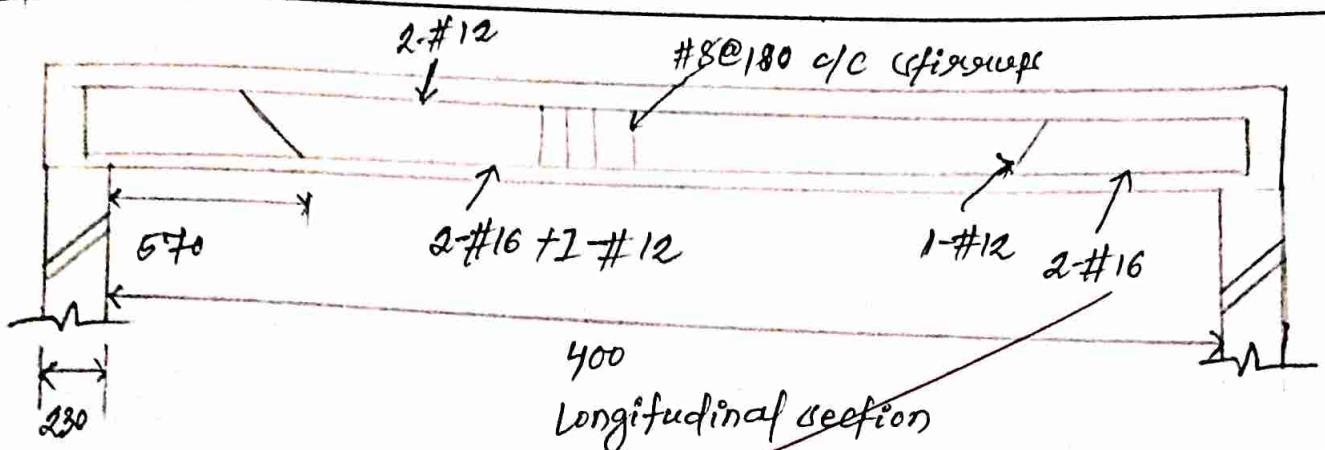
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SHEET NO. 07



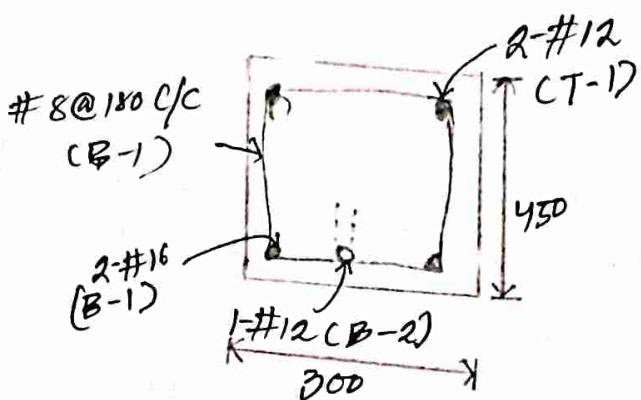
~~Bar bending schedule provides the reinforcement calculation for reinforced concrete beam. It provides details of reinforcement cutting length, type of bends and bend length. We will take one example for reinforcement quantity calculations for a concrete beam.~~

Bar Bending Schedule for Reinforced Concrete Beam
Example of Beam Reinforcement Calculation
Consider a beam of clear length of 4m, 300mm wide by 450mm depth. It consists of 2x12 diameter bars at top and 2x16 diameter and 1x12 diameter bars at the bottom. Diameter of stirrup is 8mm spaced at 180mm center to center. Clear cover to reinforcement provided is 40mm



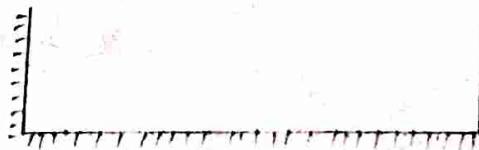
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Rcc beam cross-section

Now we will calculate the length of reinforcement based on shapes of reinforcement required for reinforce of concrete in above example
we will start with bottom reinforcement : BI Bar shape of BI is as shown below.



Length of BI = clear distance between walls + $\frac{1}{2} \times$ width of walls - $2 \times$ base cover + $2 \times$ bend length Bend length = 6×16 = 96 consider as 100 mm Bend length is calculated as $6 \times$ diameter of bar for reinforcement conforming to IS : 1786 - 1961 length of BI = $4000 + 2 \times 230 - 2 \times 40 + 2 \times 100 = 4580$ mm length of bar B2 is calculated based on shape of this bar. this bar bends up near the support as showing below.



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$$\text{length of bar } B_2 : A + B + C = 400 + 2 \times 230 - 2 \times 40 + (1.414 \times 4 - 4)$$

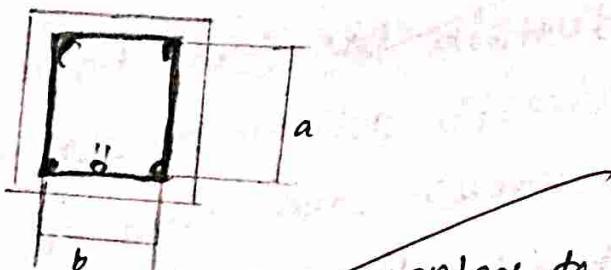
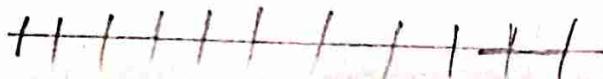
$$H = 450 - 2 \times 40 - 2 \times 12 - 2 \times 12/2 = 334 \text{ mm}$$

$$B_2 = 400 + 2 \times 230 - 2 \times 40 + (1.414 \times 334 - 334) = 4518.3 = 4520 \text{ mm}$$

$$\text{length of bar } T_1 = 4000 + 2 \times 230 - 2 \times 40 = 4380 \text{ mm}$$

$$\text{length of bar } T_2 = 4000 + 2 \times 230 - 2 \times 40 = 4380 \text{ mm.}$$

length of stirrups s_1



Stirrups are spaced at 180mm center to center. Stirrups are provided between walls to support free a beam. No. of stirrups required for given beam = $\frac{4000}{180} = 22$

$$\text{length } a = 450 - 2 \times 40 - 8 = 362 \text{ mm}$$

$$\text{length } b = 360 - 2 \times 40 - 8 = 212 \text{ mm}$$

therefore. length of 1 stirrups $s_1 = 2 \times (212 - 202) + 362 +$

$$90) = 1328 \text{ mm}$$

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Bar Bending Schedule for Slab

There are 16 different types of slabs in construction with the thickness of slab generally varies between "4" to "8". We generally adopt 6 (0.15") slab thickness. For occasionally heavy loads we adopt 8" and above thickness slabs. Quantity of Reinforcement (Steel) required for slab or

Bar Bending Schedule for Slab

primarily slab are classified into two types slab and two way slab to know more about the different refer were.

In one way slab - main bars are provided in standard direction (cranked bars) and distribution bars are provided in longer direction (straight bars) whereas in two-way slab main bars cranked bars are provided in both directions. usually the two-way slab is adopted when the length and width of the slab is more than 4m.

Well to make you perfect in bars bending schedule for a slab. can considering a one-way slab and two way slab as shown in the figure. main bars are provided in two-ways slab. distributions bars are provided in both sides of slab



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Distribution bars: these bars are straight bars main bars. these bars are cracked bars. main bars are cracked at an angle of 45 degree with the length of 0.42D.

Where α = depth of slab - top cover - bottom cover extra bars the extra bars is provided at the bottom of cracked bars to maintain the framework of the slab the length of extra bar is 44

Steps to calculate the reinforcement required for slab

1. deduct the cover for bending length of bar
2. evaluate the length of the distribution bar
3. calculate the value of α , depth of slab, top cover & bottom cover
4. find out the no. of bars
5. compute the total out of steel required for slab reinforcement consider

dia of bars = 16mm, spacing between bars = 0.10m

depth of slab = 0.15m.



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Floor slab - I (Two-way slab):

Bases along X axis:-

1. Deduction of cover:- For this divide the beam into two parts with axis line, from the ~~biggest~~ breadth and depth of beam is 0.4×0.4

2. length of distribution base = Base length c/c - deduction of covers (both sides) $+ 0.420 \times 2$

$$= 4.2 - 0.025 - 0.025 + 0.420 \times 2$$

δ = depth of slab - top cover - bottom cover

$$\text{depth of slab} = 0.15m$$

As per condition for $0.15m$ cover of $0.02m$ is provided from top and bottom
therefore: $\delta = 0.15 - 0.025 - 0.025 = 0.1m$

length of distribution base = $4.2 - 0.025 - 0.025 + 0.420 \times 0.1 \times 2 = 4.234m$

3. No of bases = $\frac{\text{opp length}}{\text{spacing}} + 1$

$$= \frac{38}{0.1} + 1 = 39. \text{ bases}$$

4. extra bar length = $\frac{L}{q} = \frac{4.15}{q} = 0.1.0375m$



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5. For each base - 2 extra bases are provided therefore length of extra base for 1 base = $1.0375 \times 2 = 2.075$

6. total length of distribution bars = 89×4.234 th length of extra base = $105.120m + 39 \text{ bases} \times 2.075 = 248.051$

7. weight of steel base in = ~~0.2~~

$$(\text{For } 10\text{mm}) = \frac{0.2}{16^2} = 0.061 \text{ kg/m}$$

8. total weight of steel = $0.61 \times 248.051 = 150.091 \text{ kg}$

bases along Y axis:

1. deduction of cover: for this divide the beam into two parts with axis line from the figure breadth & depth of beam is 0.4×0.4

2. length of distribution bars = ~~Bar length c/c deduction of cover (both sides) + $0.42D \times 2$~~

$$\Rightarrow 4.2 - 0.025 - 0.025 + 0.42D \times 2$$

D = depth of slab - top cover - bottom cover depth of slab = $0.15m$

As per condition for $0.15m$ cover of $0.025m$ is provided from top and bottom.

therefore $\cdot D = 0.15 - 0.025 - 0.025$

$$= 0.1M$$



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length of distribution bar = $4.0 - 0.025 - 0.025 + 0.42 \times 0.1 \times 2$
= 4.034m

3. No of bars = $\frac{\text{opp length}}{\text{spacing}} + 1 = \frac{4.0}{0.1} + 1 = 41 \text{ bars}$

4. Extra Bar length = $\frac{L}{4} = \frac{895}{4} = 0.9975m$

5. for each bar 2 extra bars are provided
therefore length of extra bars of 1 base = 0.9975×2

6. total length of distribution bars = $41 \times 4.03 + \text{length of extra bars}$
= $165.394m + 46 \text{ bars} \times 0.9975m = 246.369$

7. weight of steel bar in $= \frac{D^2}{162} \text{ kg/m}$

(bar 10mm) $= \frac{10^2}{162} = 0.61 \text{ kg/m}$

8. total weight of steel = $0.61 \times 246.369 = 150.285 \text{ kgs}$
total wt of bars = $150.285 + 150.091$
= 300.376 kgs


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floor floor slab - 2 (one way slab):-

As per the above figure floor slab - 2 is a one way slab in this kind of slab main's bars

(cranked bars) are provided in shorter direction hence there is no need of calculating the crank bar length in y-direction evaluate the length of bars. by deducting the covering length of whereas in x direction crank bar length is consider

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Definition of project management:

It is defined project management as the application of knowledge, skills, tools and techniques to a broad range of activities in order to meet the requirement of a particular project.

An easy project management definition involves a few main premises

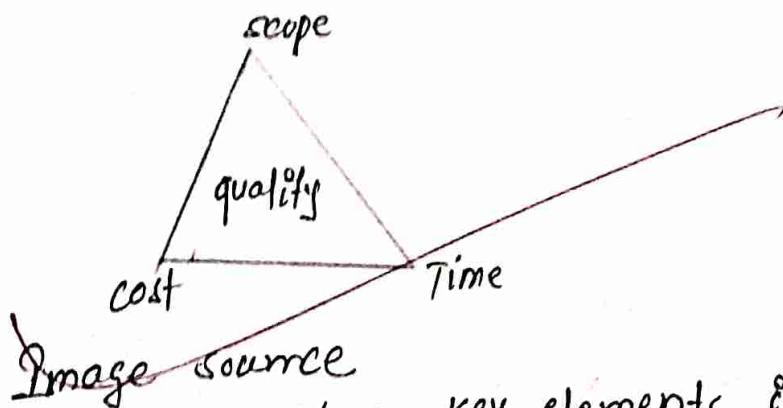
1. project management is no small challenge
 2. the management of the project has a definite start and end. It is not an ongoing method.
 3. project management utilizes different instruments to evaluate performance and monitor project bases to these include structures for work break down charts form and charts for PERT
 4. project often need resources that are ad-hoc rather than committed. It creates fulltime positions in organization
 5. project management lowers risk and improves oppose
- to summarize project management frequently referred to as the



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"triple constraints" time price and range are the three most significant variables. these shape the vertices as the main features of value



generally there are four key elements in the "triple constraint"

1. project must be cost - effective

2. project need to be delivered on time

3. there must be scope for projects

4. projects must satisfy the demands of client quality

phases of project management:

A project runs through six stages during its life cycle

1. project definition: defining the objectives properties and critical success factors for the projects

2. project initiation. everything needed to build up the project before the job can begin



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3. project planning. detailed instruction on how the project will be carried out including movement price and resource estimates
4. project execution working to deliver the product services or designed outcome.
5. project monitoring & control ensuring that a project remains on track and taking corrective action to ensure completion of the project
6. project closure. formal acceptance of the deliverables and disbandment of all the elements required to run the project.

Role of a project manager

Accountability of the entire project is the sole of the project manager. the tasks of the project manager is to guide, monitor and regulate the project team to finish project managers should not performance the tasks within the project if is sufficient to manage the project. here are some of the operation undertaken by a project manager.

1. the project manager has to set the projects ultimate objective and motivate the project squad to finish the project on time



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2. the project manager must regularly report advancement to all stakeholders
 3. the project manager has to identify the project decrease if to a collection of manageable activities, get adequate funds and create a squad to do the Job
- project management is all about establishing an atmosphere and circumstances for achieving a specific goal or objectives with a group of individuals in a monitored way

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