

MID TERM PAPER

NAME

MISBAH

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Subject

Quantity

Department

Civil Eng

Question 1)

Determine the quantity of various material to prepare 100 cft concrete mixer?

a) Given \rightarrow 100 cft concrete
Mixer Design (1:4:8)

Required:

Various material quantity

Sol:

$$\begin{aligned} \text{Volume of concrete} &= 100 \text{ cft} \\ \text{for Dry volume} &= 100 \times 1.54 \\ &= 154 \text{ ft}^3 \end{aligned}$$

$$\text{Min Design} = 1 + 4 + 8 = 13$$

The quantity of ^{cement} concrete

$$\text{Ratio of cement / sum of ratio} \times \text{Dry vol}$$

$$= \frac{1}{13} \times 154 = 11.78 \text{ ft}^3$$

Now for no of Bags

We know that

$$1 \text{ Bag} = 1.25 \text{ ft}^3$$

a)

$$So = \frac{11.75}{1.25}$$

$$= 9.42 \text{ Bags}$$

2) Quantity of sand

Ratio of sand / sum of ratio \times Dry material

$$= \frac{4}{13} \times 154$$

$$= 47.12 \text{ ft}^3$$

3) Quantity of C.A

Ratio of C.A / sum of ratio \times Dry material

$$= \frac{8}{13} \times 154$$

$$= 94.24 \text{ ft}^3$$

(B)

Given

Brick Work (Volume) = 75 ft³
Min Design = 1:4

Required

No of Brick = ?
Dry Volume = ?

Quantity of mortar?

Solution

Size of Brick = 9" x 4.5" x 3"
Volume of Brick = 121.5 Arch.
Volume of Brick Wall = 75 ft³

No of Brick with mortar = 75

$$\left(\frac{121.5}{(12.5)} \right) = \frac{121.5}{(12.5)}$$
$$= \frac{75}{0.0703}$$

No of Brick = 1066.85

2nd Method

1 cubic feet = 13.75 ft bricks or 14 bricks
75 cubic feet = 76 x 13.75 or 14

(31)

No of brick = 1050 bricks

But 1st method is more accurate and step by step method

⇒ for No of bricks without a motor
25.1. Deduction for motor

$$= \frac{25}{100} \times 75$$

$$= 18.75 \text{ ft}^3$$

Net brick work = Total Brick W.
Volume of Motor

$$= 75 - 18.75$$

$$= 56.25 \text{ ft}^3$$

Now

No of brick = $\frac{\text{Net brick work}}{\text{Volume of 1 brick}}$

$$= \frac{56.25}{\left(\frac{121.5}{125}\right)} = \therefore \frac{121.5}{125}$$

$$= \frac{56.25}{0.0703}$$

No of bricks 800.142

(5)

For Dry Volume

$$= \frac{25}{100} \times 76$$

So = 18.75 ft³ (wet volume)

$$\begin{aligned} \text{Dry Volume} &= \text{Wet Volume} \times 1.27 \\ &= 18.75 \times 1.27 \\ &= 23.81 \text{ ft}^3 \end{aligned}$$

Now

⇒ For Cement

Quantity of Cement = $\frac{\text{Ratio of cement}}{\text{sum of ratio} \times \text{Dry material}}$

Ratio = 1:4 (1 cement and 4 sand)
sum of ratio = 5

$$\text{Quantity of cement} = \frac{1}{5} \times 23.81 = 4.76 \text{ ft}^3$$

As we know that

$$1 \text{ Bag} = 1.25 \text{ ft}^3$$

$$\text{No of Bags} = \frac{4.76}{1.25} = 3.8 \text{ or } 4$$

so the no of bags = 4
'For sand

$$\text{Quantity of sand} = \frac{4}{5} \times 23.81$$

$$= 19.05 \text{ ft}^3$$

Question 1

- 1) What is mean by Dry and wet volumes? Why 1.27 and 1.54 is used in construction project?

Dry Volume:

Dry volume means volume of ingredients of concrete like sand cement & Aggregate in mix dry condition before adding or without water.

Wet Volume

Wet volume means of ingredient of concrete like sand cement & aggregate but in wet volume water is must added.

1.54 Factor

Dry volume of Concrete

= wet volume of 84% wt of

Dry volume of concrete is mixture of cement sand & aggregate without water and

In dry condition, their volume is increase by 54.1. Their volume is volume. Due to the presence of air voids in the presence of sand and aggregate.

In practice that is why we multiply 1.64 factor is calculation for our quantities

Factor = 1.27

A Dry Volume of Mortar = Wet V
 $\frac{+27.1}{W.V.}$

The dry volume of mortar measured for determine the quantity of cement and sand for the formation of mortar. For our masonry work.

IF the volume of mortar is in dry condition it is required to multiply the

wet volume with 1.27 to

obtain dry volume of mortar and there are air voids

in cement and sand that

why we multiply the

factor 1.27 in order to

calculate the cement and sand.

Benefit of Quantity survey and estimation of project in a construction

There are several benefits of quantity survey and estimation

- 1) Amount of money required to complete work.
- 2) To know about quantities of material required to complete work.

To justify the investment period from the completion of work involved in the estimate.

Asses to the requirement of plants and equipment to complete work accordingly.

Question : - (2)

⇒ For Long wall :-

the length of long wall centre of centre.

$$= 10 + \frac{1}{2} \times 0.30 + \frac{1}{2} \times 0.30$$

$$= 10 + 0.15 + 0.15 = 10.30 \text{ m}$$

⇒ For short wall :-

The length of short wall centre to centre

$$= 8 + \frac{1}{2} \times 0.30 + \frac{1}{2} \times 0.30$$

$$= 8 + 0.15 + 0.15 = 8.30 \text{ m}$$

Particular item	No's	length	Breadth	height	Quantity	Explanation Note
Foot work in excavation in foundation					18	
long walls	2	11.2 m	0.9	0.9	18.144 m ³	length = 10.30 + 0.9 = 11.2
short walls	2	7.4 m	0.9	0.9	11.988 m ³	length = 8.30 + 0.9 = 7.4
				total	30.132 m ³	
Concrete in foundation						
long wall	2	11.2 m	0.9	0.3 m	6.048 m ³	length same
short wall	2	7.4 m	0.9	0.3	2.946 m ³	as for equal
				Total	6.048 + 2.946 = 8.994 m ³	

Item No.	Particulars	No.	length	with	Height	Quantity
(3)	Brick work in Foundation					
	Long Walls					
	1st Footing	2	10.9 m	0.6 m	0.3 m ³	3.924 m ³
	2nd Footing	2	10.8 m	0.5 m	0.3 m ³	3.24 m ³
	Pinth walls	2	10.7 m	0.4 m	0.6 m ³	5.136 m ³
	Short wall -					
	1st Footing	2	7.7 m	0.6 m	2.772 m ³	
	2nd Footing	2	7.8 m	0.5 m	2.34 m ³	
	Plinth wall	2	7.8 m	0.4 m	3.792 m ³	
				Total	21.204 m ³	
4	Brick work in Super Structure					
	Long walls	2	10.6 m	0.3 m	3.50 m	22.26 m ³
	Short wall	2	8 m	0.3 m	3.50	16.8 m ³
				Total	39.06 m ³	

Explanator Note

Long wall

1st Footing Length = $10.30 + 0.6 = 10.9 \text{ m}$

2nd " " = $10.30 + 0.5 = 10.8 \text{ m}$

width walls = $10.30 + 0.5 = 10.7 \text{ m}$

Short wall (length) =

$$\begin{aligned} \text{1st Footing} &= 8.30 - 0.6 = 7.7\text{m} \\ \text{2nd Footing} &= 8.30 - 0.5 = 7.8\text{m} \\ \text{Plinth walls} &= 8.30 - 0.4 = 7.9\text{m} \end{aligned}$$

$$\begin{aligned} \text{Length Long Wall} &:- 10.30 + 0.3 = 10.6\text{m} \\ \text{Length Short Wall} &:- 8.30 + 0.3 = 8\text{m} \end{aligned}$$

Question:- 03

$$\begin{aligned} \Rightarrow \text{Total Centre Length of wall} &= \text{wo} \\ &= 2 \times \text{C.toc of long wall} + 3 \times \text{C.toc short} \\ &= 2 \times 8.60 + 3 \times 4.30 \\ &= 11.2 + 12.9 = 24.1\text{m} \end{aligned}$$

Item No	Particulars	No	length	width	Height	Quantity	Explanatory Note
1	Excavation For Foundation	1	23.2m	0.9m	1.3m	27.144 m^3	$= 24.1 - 2 \times 0.9/2$ Length = 23.2m
2	PCC in Foundation	1	23.2m	0.9m	0.10m	2.088 m^3	Length = $24.1 - 2 \times 0.9/2$ Length = 23.2m
3	Brick (W) in foundation						
	1st Footing	1	23.5m	0.6m	0.20m	2.82 m^3	Length = $24.1 - 2 \times \frac{0.6}{2} = 23.5 \text{ m}$
	2nd Footing	1	23.6m	0.8m	0.20m	2.36 m^3	Length = $24.1 - 2 \times \frac{0.5}{2} = 23.6 \text{ m}$
3	3rd Footing	1	23.7m	0.4m	0.20m	1.896 m^3	Length = $24.1 - 2 \times 0.4/2 = 23.7 \text{ m}$
	plinth wall	1	23.8m	0.3m	0.20m	4.284 m^3	$= 24.1 - 2 \times 0.3/2 = 23.8 \text{ m}$
	below G.L	1				11.36 m^3	