ESTIMATION

&

COST EVALUATION-I

TH-4

3rd SEM

CIVIL ENGG.

Under SCTE&VT,Odisha

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ESTIMATE

⇒ The process of the calculating the quantity and cost of various item requires in connection with the work

⇒ It is prepare calculate the quantity based the dimension of drawing for various item required to complete the project and multiply by unit cost of item consist.

Propose of Estimate

⇒ To know the necessary amount of money

⇒ Propose of estimating knowing the quantity of material cement steel etc.

⇒ To calculate no of different categories of worker

⇒ To access the requirement of tools, plant equipment

⇒ To fix of the completional period

⇒ To draw a construction drawn Schedule or program

⇒ To fix of the funds requirement

⇒ To invite the tenderers prepare bills

Requirements of estimate

⇒ plan of a building structure.

⇒ C/S elevation of the structure

⇒ Specification.

Types of estimate

⇒ plinth area estimate
⇒ cube rate estimate
⇒ preliminary approximate estimate
⇒ labour estimate
⇒ Abstract estimate
⇒ Detail estimate
⇒ Annual Repair and maintenance
⇒ Supplementary estimate
⇒ Revised estimate

plinth area estimate

⇒ In a particular locality the cost of expenditure is already constructed and it is divided by the plinth area of the same building to get the plinth area rate. multiply the plinth area rates with the proposed building to get approximate expenditure of that building.

Cube rate estimate

⇒ with the plinth area the height of the building is multiplied to get the cube rate of the building.

PRElimiNARY / ROUGH / APPROXimate estimate

=> Here the total Running length of wall is calculated and it is divided with the cost of the building to get approximate cost per unit length of wall

labour Estimate

=> Here the quantity of material to be used in a building is calculated separately and labour Required. For per square meter of plinth area of work is calculated

Revised Estimate

=> In the detailed estimate of the Revised quantity and rate of the items of work originally provided in the estimated with out material deviation of structure nature from the design originally approved for a project a revised estimate is prepared / submitted by the fresh technical Sanction.

Detailed Estimate

=> In to detailed estimate the quantity of all items involved and calculate with their respective dimension with the help of detailed estimate table then the quantity of each item is calculated in the tabular form

Sl No	Description	No of item	L (m)	B (m)	H (m)	Qty	Remark

Supplementary Estimate

⇒ During the construction of project some change and addition of work like addition of extra rooms design of buildings may be necessary for which there is no estimate is prepared and this estimate is prepared and added to original estimate is called as supplementary estimate.

Abstract estimate

⇒ It is the second part of the detailed estimate. The cost of each and every individual item of work is calculated by multiplying the qty computed in the measurement with the specified rate is known as abstract estimate

Sl no	Particulars description	Qty	Unit	rate	unit of rate	amount	remark

Annual Repair and maintance Estimate

⇒ After completion of work it is necessary to maintain the same for its proper function and for that an estimate is prepared for the item which are required for renewale, Replacemen and Repair etc in the formed of detailed estimate

e.g - white washing of building not holes Repairs.

Sl No	Description of item	Unit of measurement	Unit of rate
1	earth in excavation	cum	per cum
2	clearing of small trees	sqm	per sqm
3	cutting of trees	number	per number
4	earth work in filling	cum	per cum
5	Surface Dressing	sqm	per sqm
6	Brick work of one or more than on brick wall	cum	per cum
7	Honey comb brick work	sqm	per sqm
8	lime/concrete in foundation	cum	per
9	R.C.C	cum	per cum
10	Reinforcement.	quintal	per quintal
11	Damp proof course (DPC)	sqm	per sqm
12	Stone work in wall facing	sqm	sqm
13	Stone work in steps, lintel coping etc.	cum	per cum
14	lime terracing on roof	sqm	per sqm
15	Filed Roofing	sqm	per sqm
16	AC & GI Roofing	sqm	per sqm
17	ceiling	sqm	per sqm
18	flooring	sqm	per sqm
19	Doors & window shutters	sqm	per sqm
20	wood work in door & window frame	cum	cum

SL no	Description of item	Unit of measurement	Unit of rate
21	Hand rails	Rm	Per Rm
22	Grill Rails	Rm	per Rm
23	Steel work in trusses	quintal	per quintal
24	Cast iron work, frames, pully, manhole covers	Kg	per Kg
25	Bolts including nuts and washers	Kg	per Kg
26	collapsible gate, steel Rolling, SHUTTERS, Grills	Sqm	Per Sqm
27	Steel doors and window iron gate	Sqm	per Sqm
29	wire fencing	Rm	Per Rm
30	plastering	Sqm	Sqm
31	Threading iron	Cm	Cm
32	welding	Cm	
33	Solder of sheets	Cm	
34	pocating	Sqm	
35	white washing	Sqm	
36	distemper	Sqm	
37	painting	Sqm	
38	finishing	Sqm	
39	polishing	Sqm	
40	Coal tarring	Sqm	
41	Removing of paint	Sqm	

4. Timber	...	Length in m and cross sectional dimensions in cm. or mm.
5. Mild steel bars	...	Length in m and dia. in mm.
6. Rolled steel sections	...	Length in m and section in mm.
7. Masonry (brickwork, stone masonry etc.)	...	Length and height in m.
8. Concrete work (cement or lime concrete, R.C.C. work, concrete flooring etc.)	...	Thickness or breadth in cm.
9. Door, windows etc.	...	Length and breadth in m.
10. White washing, colour washing distempering, painting etc.	...	Thickness in cm.
11. Hardware articles	...	Height and breadth in m or cm.
		Length and breadth or height in m
		Size of the articles in cm or mm.

4-3. Principle Units for various items of works :–

(a) Mass, voluminous and thick works shall be taken in cubic unit or volume (viz. cubic metre, cu m)

(b) Thin, shallow and surface work shall be taken in square unit or in area. The thickness shall be specified in the description of the item and the measurement of length and breadth or projection shall be taken to calculate the area. (viz. square metre, sq m.).

(c) Long and thin work shall be taken in linear or running units, and linear measurement shall be taken. (viz. running metre, rm.).

(d) Piece work, job work etc. shall be taken in number.

4-4. Limits of measurement and degrees of accuracy in Estimating :–

During preparation of an estimate of main head smaller dimensions in its various sub-heads should not be neglected as those affect the total quantity of main head. No approximation should be made after omitting fractional dimensions either directly from the drawings or from those determined from the plan.

(1) Limits of measurement according to SP : 27-1984

(a) Dimensions shall be measured to the nearest 0.01 m except for (i) *thickness of slab* or R. C. slab which shall be measured to nearest 0.005 m; (ii) *Woodwork* to nearest 0.002m ; (iii) *Steelwork* to nearest 0.001m; reinforcement to nearest 0.005 m; (iv) thickness of *roadwork where the thickness is less than 20cm; the thickness shall be measured* to nearest 0.005 m.

(b) Areas shall be worked out to the nearest 0.01 sq m. For *steelwork* areas excluding cross-sectional measurements shall be worked out to nearest 0.001 sq m.

(c) Cubic contents shall be worked out to nearest 0.01 cu m except for *woodwork* shall be worked out to nearest 0.001 cu m.

(d) Weights shall be worked out to nearest 1 kg.

(2) Rates : The degree of accuracy in calculations depends upon the rate of the item of work. Thus, where the rates are per hundred (per %) or per thousand (per $\%_0$) units, greater accuracy is not required. But where the rates are per metre (per m) or per running metre (per rm), per square metre (per sq m), per cubic metre (per cu m) calculations should be carried out up to two places of decimal for greater accuracy at higher rate. The limits of measurement as stated above in (1) shall be followed.

Any work done by the Contractor extra over the specified dimensions shall be ignored.

4-10. Different Methods for Estimating Building Works :–

The quantities of various items such as earthwork in excavation, foundation concrete, brickwork in foundation and plinth, brickwork in superstructure, etc. can be estimated by any of the following three methods:–

(1) Long and Short wall or 'out-to-out' & 'in-to-in' method or P.W.D. method.

(2) Centre line method.

(3) Crossing method.

(1) 'Long and Short wall' or 'out-to-out' and 'in-to-in' method : – In this method the longer walls in a building (generally in one direction) are considered as long walls and measured from out-to-out; and the shorter or partition walls, in a perpendicular direction of the long walls, are considered as short walls and are measured from in-to-in for a particular layer of work. These lengths of long and short walls are multiplied separately by the breadth and height of the corresponding layer and are added to get the quantity. *Such lengths of long and short walls vary in every layer of footing.*

To calculate the lengths of long and short walls determine first their centre to centre lengths individually from the plan. Then the length of the long wall, out-to-out may be calculated after adding half breadth of wall at each end to its centre to centre length. Thus the length of the short wall measured in-to-in may be found out after subtraction of half breadth at each end from its centre to centre length. The length of the long wall generally decreases from earthwork to brickwork in superstructure and in the case of the short wall, its length increases (see Fig. 4-12). *Thus the length of long wall is found out by adding one breadth of the footing to the centre to centre length of that footing. The length of short wall is found out by subtracting one breadth of the footing from the centre to centre length.*

In some of the working examples it may be noticed that a wall is considered as a short wall at one end and as a long wall at the other end. Such a case arises in a wall which joins as a long wall with another long wall previously considered. The joining end of the wall later considered as long wall is actually treated as short end, such a wall is *termed a Long-Short wall in this book.*

(2) Centre line method :- In this method calculate the total centre line length of walls in a building and multiply the same by the breadth and depth of the respective item to get the total quantity at a time. For different sections of walls in a building, the centre line length for each type shall be worked out separately. In case of partition or verandah walls joining the main walls, the centre line length shall be reduced by half of the breadth of the layer of main wall that joins with the partition or verandah wall at the same level Number of such joints are studied first to calculate the centre line length.

By this method estimates may be prepared more quickly and this method is as accurate as the other methods. Only in the case of an unsymmetrical wall which is generally rare, no advantage may be claimed by this method over others as the centre line length varies at every layer. But to estimate circular, hexagonal octagonal, etc. shaped building this method is specially useful.

(3) Crossing Method :- In this method calculate the overall perimeter of the building and subtract from this, four times the thickness of the wall to obtain the centre line length.

Internal walls are grouped separately to their sections and measured in between the internal faces of the main wall at that level.

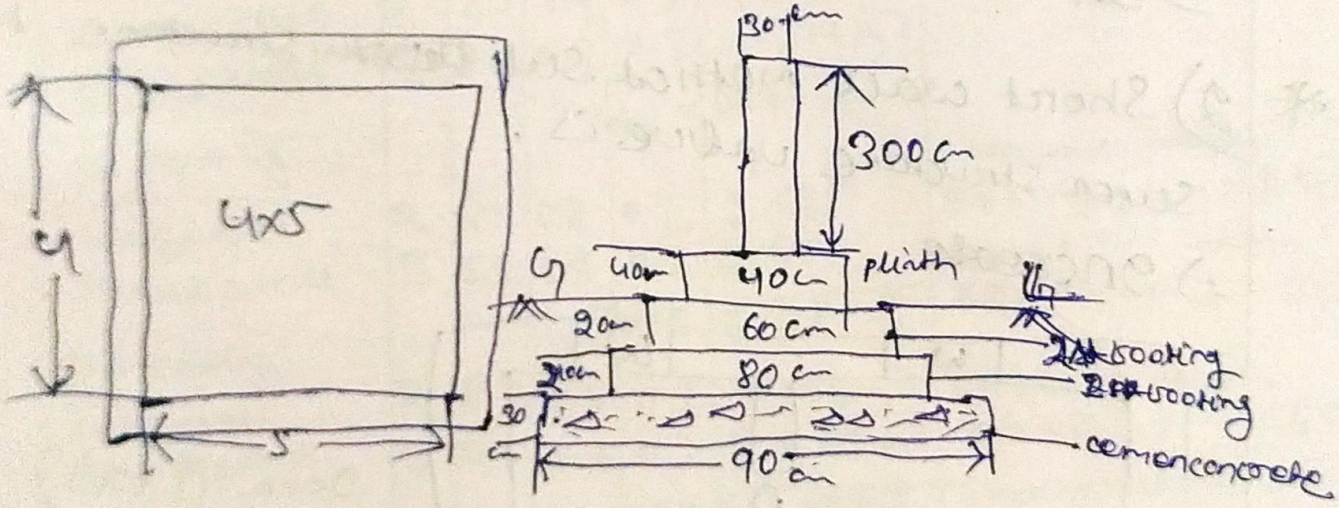
Principally this method is the same as the centre line method but differs in the process of calculation to find the centre line lengths.

English Method of taking out quantities :- The dimension sheet used for taking-off is a foolscap sheet divided into main sections each section having four columns. Column (1) is termed *timesting*" and is used for setting the number of the item. Column (2) is known '*dimension column*'. In this column measurements are written. Column(3) is called '*squaring column*'. Quantities worked out

1 bbb

1) Longwall & Short wall method
2) Center line method

Longwall & Short wall method



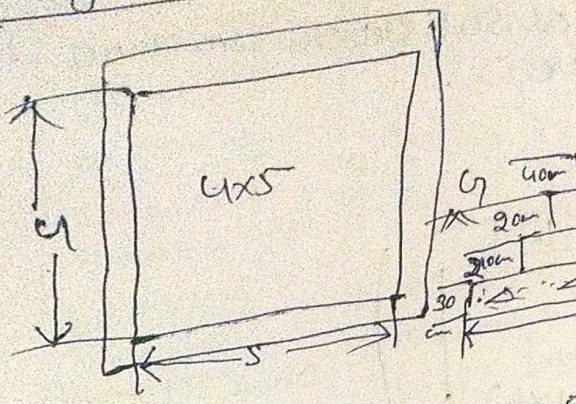
Longwall = 5+.15+0.15 = 5.3 m
Short wall = 4+0.15+0.15 = 4.3 m

Sl no	Item of work	No	L (m)	B (m)	H (m)	Q+y	Explantory
5)	plinth						
	Longwall L= 5.3+0.2+0.2=5.7	2	5.7	0.4	0.4	1.82 cum	
	Short wall L= 4.3-0.2-0.2=3.9	2	3.9	0.4	0.4	1.24 cum	
					Total=	3.06 m3	
6)	Brick work Superc Structure						
		2	5.6	0.3	?	10.08 cum	

Glass pannel	SQM	Per. Sq.
Binding steel reinforcement	Quintal.	
~~Reinforcement~~		
Green Railing	Quintal	
Green Grills	SQM	
Rain water pipe / Main pipe / Flue pipe.	Rm	Rm
Barbed wire	Rm	
Shutter top cover	Rm	

Sl.No	Item of work	NO	L (m)	B (m)	H (m)	Q+y
1)	**Excavation**					
	1) Long wall ⇒ 5.3+0.45+0.45=6.2	2	6.2	0.9	0.70	7.81 cum
	2) Short wall	2	3.4	0.9	0.7	4.28 cum
	⇒ 4.3 − 0.45 − 0.45 = 3.4					Total 4209 cum
2)	**Cement concrete**					
	Long wall ⇒ 5.3+0.45+0.45=6.2	2	6.2	0.9	0.3	3.34
						1.84
	Short wall ⇒ 4.3−0.45−0.45=3.4	2	3.4	0.9	0.3	Total = 5.18 cum
3)	**1st Footing**					
	Long wall L = 5.3+0.4+0.4=6.1	2	6.1	0.8	0.2	1.95 cum
	Short wall L = 4.3−0.4−0.4=3.5	2	3.5	0.8	0.2	1.22 cum
						Total = 3.07
4)	**2nd Footing**					
	Long wall L = 5.3+0.3+0.3=5.9	2	5.9	0.6	0.2	1.41 cum
	Short wall L = 4.3−0.3−0.3=3.7	2	3.7	0.6	0.2	0.88 cum
						Total = 2.29 cum

Longwall & Short



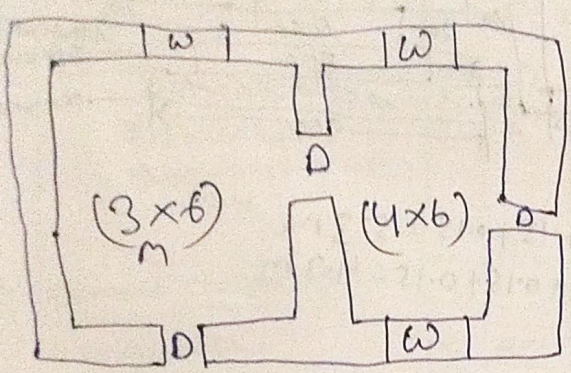
- Long wall = 5+.15+0.15 = 5
- Short wall = 4+0.15+0.15 =

Sl No	Item work	No	L (m)
5)	**Plinth**		
	Long wall $L = 5.3 + 0.2 + 0.2 = 5.7$	2	5.7
	Short wall $L = 4.3 - 0.2 - 0.2 = 3.9$	2	3.9
6)	**Brick work Super Structure**		
	Long wall $L = 5.3 + 0.15 + 0.15$ $= 5.6$	2	5.6
	Short wall $L = 4.3 - 0.15 - 0.15$ $= 4$	2	4

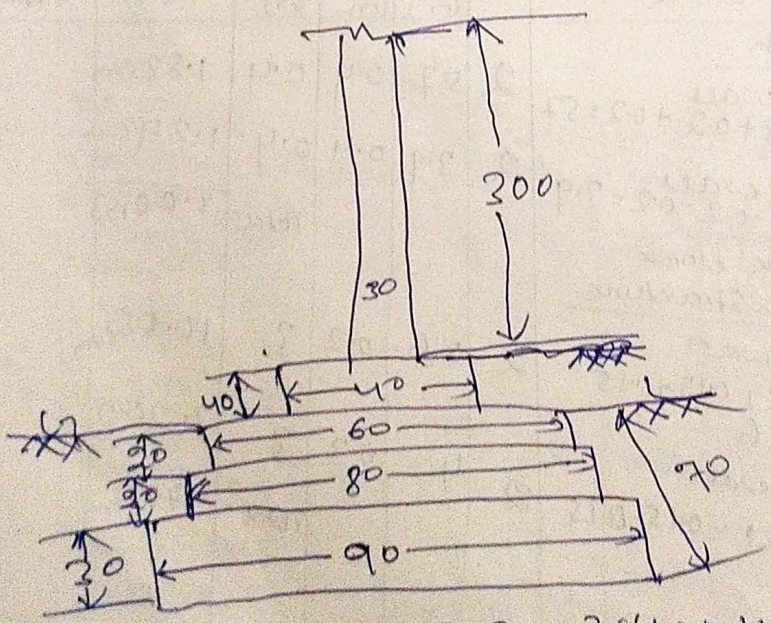
Total work = 12.09 + 5.17 + 3.07 + 2.29 + 3.06 + 17.28 = 42.116 m^3

** 1) Long wall method Substructure to Superstructure value is
=) Decrease

** 2) Short wall method Sub ~~structure~~ Structure to Super structure value is.
=) Increase



Door = (1×2.1)
window = (1.5×1.2)

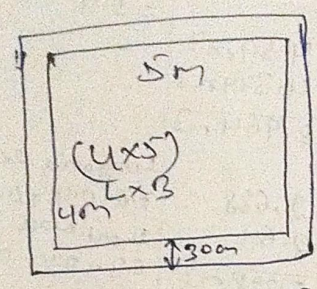


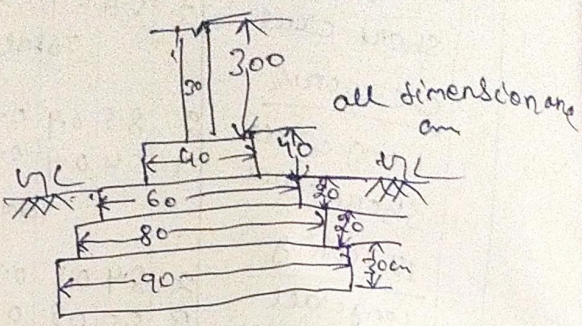
Long wall ~~length~~ = 0.15 + 3 + 0.3 + 4 + 0.15 = 7.6m

Short wall = 0.15 + 6 + 0.15 = 6.3

Sl No	Item of work	No	L (m)	B (m)	H (m)	Q+y	Explantory
	Earth work excavation						Long wall Length = 7.6+0.45+0.45=8.5
	Long wall	2	8.5	0.9	0.7	10.71 m^3	
	Short wall	3	5.4	0.9	0.7	10.206 m^3	Short wall length = 6.3 - 0.45 - 0.45 = 5.4
				Total		20.916 m^3	
	C.C work						
	Long wall	2	8.5	0.9	0.3	4.59 m^3	
	Short wall	3	5.4	0.9	0.3	4.374 m^3	
				Total =		8.964 m^3	
	1st Footing						Long wall length 7.6+0.4+0.4=8.4
	Long wall	2	8.4	0.8	0.2	2.688	Short wall length 6.3-0.4-0.4=5.5
	Short wall	3	5.5	0.8	0.2	2.64	
				Total		5.328 m^3	
	2nd Footing						
	Long wall	2	8.2	0.6	0.2	1.968 m^3	Long wall length 7.6+0.3+0.3=8.2
	short wall	3	5.7	0.6	0.2	2.052 m^3	Short wall length 6.3-0.3-0.3=5.7
				Total =		4.02 m^3	
	plinth						
	Long wall	2	8	0.4	0.4	2.56 m^3	Long wall length 7.6+0.2+0.2=8
	Short wall	3	5.9	0.4	0.4	2.832 m^3	Short wall length 6.3-0.2-0.2=5.9
				Total =		5.392 m^3	
	~~Stone~~ Super structure brick work						Long wall length 7.6+0.15+0.15=7.9
	Long wall	2	7.9	0.3	3	14.22 m^3	Short wall length 6.3-0.15-0.15=6
	Short wall	3	6	0.3	3	16.2 m^3	
				Total =		30.42 m^3	
	~~Deduction~~ deduction of super structure						
	Door	3	1	0.3	2.1	1.89	
	window	3	1.5	0.3	1.2	1.62	
	Lintel over door	3	1.2	0.3	0.10	.108	
	Lintel over window	3	1.7	0.3	0.10	.153	
				Total =		3.771 m^3	
	Net work in Superstructure					30.42 - 3.771 = 26.649 m^3	

Total work = 20.916 + 8.964 + 5.328 + 4.02 + 5.39 + 26.649 = 71.2 m³





L = 5 + 0.15 + 0.15 = 5.3

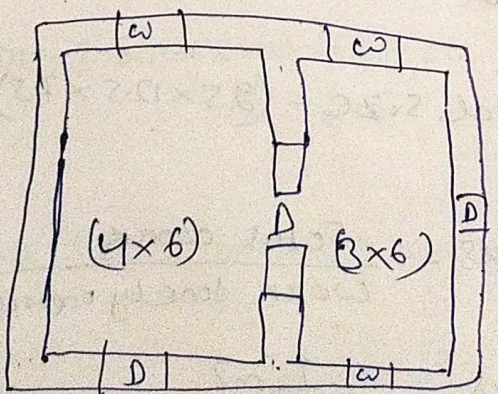
L = 4 + 0.15 + 0.15 = 4.3

Total length of centerline method = (2 x 5.3) + (2 x 4.3)

L = 19.2 m

Sl no	Item of work	Nos	L (m)	B (m)	H (m)	Q+y	Explanatory
1)	Earth work Excavation		19.2	0.9	0.7	12.096 m³	
2)	Cemen concrete work		19.2	0.9	0.3	5.184 m³	
3)	1st footing		19.2	0.8	0.2	3.072 m³	
4)	2nd footing		19.2	0.6	.2	2.304 m³	
6)	Plinth work		19.2	0.4	0.4	3.072 m³	
7)	Super structure Brickwork		19.2	0.3	3	17.28 m³	
					Total work =	43.008 m³	

Sl No	Items of work	Nos	L (m)	B (m)	H (m)	Qty	
1)	Earth work excavation		33.2	0.9	0.7	20.916m3	L = 34.1 − 2×0.90/2 = 34.1 − 2×0.45 = 33.2 m
2)	Cement Concrete work		33.2	0.9	0.3	8.964m3	
3)	1st footing		33.3	0.8	0.2	5.328m3	L = 34.1 − 2×0.8/2 = 33.3 m
4)	2nd footing		33.5	0.6	0.2	4.02 m3	L = 34.1 − 2×0.6/2 L = 33.5m
5)	plinth work		33.7	0.4	0.4	5.392m3	L = 34.1 − 2×0.4/2 L = 33.7m
6)	Superstructure brick work		33.8	0.3	3	30.42 m3	L = 34.1 − 2×0.3/2 = 33.8 m
	Deduction of Door	3	1	0.3	2.1	1.89	
	window	3	1.5	0.3	1.2	1.62	
	lintel over door	3	1.2	0.3	0.10	0.108	
	lintel over window	3	1.7	0.3	0.10	0.153	
						3.771m3	
	Superstructure (net work) B/W	→	30.42 − 3.771 = 26.649				
			Total work required			71.2 m3	



center line method

length of wall = 2(7.6) + 3×(6.3)

= 34.1m

L = 34.1m

L = .15+4+0.3+3+0.15 = 2×(7.6)

L = 3×(0.15+6+0.15) = 3×(6.3)

16. **Supplying, fitting, fixing and removing shuttering and staging.** *Unit = 1 sqm*

Consider a room = 5m x 4m with an intermediate T- beam 25 cm x 20 cm wide web. Height of the room = 3.5 m (Fig. of preepage). Area of shuttering. - (a) For beam = (20 cm + 2 x 25 cm) x 4 m = 2.8 sq m. (b) For slab = 5 m x 4 m - (20 cm x 4 m) = 19.2 sq m .:. Total area = 22 sq. m.

Particulars	No	L	B. cm	Thick-ness cm	Quantity	Rate Rs. P.	Amount Rs. P.
(a) Matrials.							
(i) *For beam-*							
Side planks ...	2	4m	25	2.5	0.050 cu m.		
Side cleats @ 1m c/c ...	2x4	30 cm	8	4	0.008 cu m.		
Bottom Plank ...	1	4m	25	5	0.050 cu m.		
Base beam (at prop only) ...	4	50 cm	10	5	0.010 cu m		
Brackets (2 nos .at porp) ...	2x4	50 cm	5	4	0.008 cu m.		
(ii) *For slab—*							
Planks = (5m – 20 cm – 2 x 2.5 cm) ...	1	4.75 in	4	2.5	0.475 cu m		
Beam @ 1m c/c = $^1/_2$ x 4.75	2x4	2.375 m	5	15	0.143 cu m		
(ii) For beam and slab braces- ...							
(a) Short side ...	7	4m	10	4	0.112 cu m		
(b) Long side ...	4	5m	10	4	0.080 cu m		
Wedges under props ...	28	22 cm	10	8	0.049 cu m		
Bearing planks under wedges	28	50 cm	22	5	0.154 cu m		
				Total=	1.139 cu m	7000.00 per cu m.	7973.00
10 cm av. dia. Bailey props @ 1m c/c (Ht. of props under beam =3.33 m but taken as 3.45 m to have a grip of 7.5 cm with beams ...	28	3.45 m	-	-	96.60 r.m.	12.00 r.m.	1159.2
						Total =	9132.2
Deduct the cost of scrap value of timber @ 8% ...					-	=	730.5
						Total =	8401.6
Assuming that this set of shuttering and staging becomes unserviceable after being used for 12 times (time of use is governed by the availability of work, cutting the frame work to suit different dimensions, damage for nailing etc.) cost for using once					6,820.51	÷12 =	700.10
(b) Labour - Head Carpenter ...					1.5 no.	146.00	70.00
Carpenter ...					3 nos.	120.00	360.00
Mazdoor (Beldar) ...					6 nos.	80.00	480.00
Carriage within a town ...					2 times	250.00	500.00
Nais ...					L. S.	L. S.	130.00
Contingencies, T. & P.etc. ...					L. S.	L. S	12.00
						Total =	2252.14
(e) Profit and overhead @ 10% ...						=	225.00

:. Rate per sq m. = $\frac{2477.35}{22}$ = 112.61 Grand Total = Rs. 2477.35

17(a). R.C.C. work 1 :1 $^1/_2$: 3 for Beam with 2.0 % steel. Unit = 1 cu m

Consider first 10 cu m.

Materials :- For concrete 1 : $1^1/_2$: 3 same as in the page 477
Steel @ 2% =10 x 0.02 = 0.2 cu m @ 78.5 q/cu m = 15.7 Qtl
Binding wire @ 1 kg/ q = 15.7 kg.

Particulars	Quantity	Rate Rs. P.	Amount Rs. P.
(a) **Materials : -**			
Stone cheps 20 mm down ...	8.4 cu m	900.00 per cu m	7560.00
Sand (coarse) ...	4.2 cu m	350.00 per cu m	1470.00
Cement ...	2.8 cu m = 80.7 bags	180.00 per bag	14526.00
Steel	15.7 Qtl.	2620.00 per Qtl.	41134.00
- Binding wire ...	15.7 kg	25.00 per kg	392.51
		Total =	65082.50
(b) **Labour -**			
(i) For concreting same as in item no. 14	-	-	
(ii) For reinforcement ...			2000.00
Blacksmith ...	15 nos.	125.00 Each per day	1875.00
Mazdoor (Beldar) ...	15 nos.	80.00 Each per day	1200.00
Sundries, T.& P.etc. ...	$\frac{1}{2}$ % (a)+(b)	L. S.	350.79
(c) **Centering and shuttering :-**			
(Hire chargc) including removing @ 5% cost of materials (a)			
Carpenter ...	65,082.00 x $\frac{5}{100}$	L. S.	3254.13
Mazdor (Beldar) ...	10 nos.	125.00 Each per day	1250.00
Nails @ 10% of hire charge ...	10 nos.	80.00 Each per day	800.00
		L. S.	325.41
(d) **Water charges:-** ...		Total =	76137.83
		@ 1% of the total =	761.38
(e) **Profit and Overhead** ...		Total =	76899.21
		@10% of the total =	7689.92

∴ Rate per cu m = Rs. 8458.91 Grand Total = Rs.84589.13

Note :- *One number Blacksmith should be considered for one quintal of reinforcement* :

The rate analysis for R.C.C column is the same as that of R.C.C. beam. Only the quantities of materials shall have to be worked out according to the proportion of concerete and percentage of reinforcement .

In the rate analysis for R.C.C column in basement in the item (c) above, shuttering only required .Therefore,shuttering should be 2% of the cost of materials of (a) above. 5 nos. Carpenters and 5 nos. Mazdoors (Bcldar) should be considered.

15(b) R.C.C. Lintel in 1:2:4: cement concrete and 0.9% steel.

The procedure for rate analysis is same as that of Sl. 17(a), Labour : Blacksmith = 7 nos. Mazdoor = 7 nos. For (c) above Carpenter = 7 nos. Mazdoor = 7 nos.

(a) Materials :-				
Bricks (kiln) 20 cm x 10 cm x 10 cm	...	5,000 nos.	2900.00 per ‰ nos.	14500.00
Sand (medium)	...	2.8 cu m	300.00 per cu m.	840.00
Cement 0.70 cu m = 21 bags	...	21 bags	180.00 per bag	3780.00
Scaffolding	...	L. S.	80.00	80.00
(b) Labour :-				
Head Mason	...	1/2 no.	125.00 Each per day	62.50
Mason ...	...	8 nos.	115.00 Each per day	920.00
Mazdoor (2 nos. as Bhisti)	...	16 nos.	80.00 Each per day	1280.00
Contingencies, T.& P. etc.	...	L.S. $\frac{1}{2}$% (a+b)	L. S.	107.3
			Total =	21569.81
(c) Water charge :-	...		@ 1% of the total =	215.70
			Total =	21785.51
(d) Profit and Overhead :-	...		@ 10% of the total =	2178.55

∴ Rate per cum = Rs. 2396.41 Grand Total = Rs. 23964.06

Brickwork for additional storey, labour cost of 1 Mason,3 Mazdoors (Beldars),and a lump sum amount Rs.40.00 for scaffolding per 10 cu m volume of work are to be added over the ground floor as illustrated below. According to All India Standard Schedule of Rate an extra over rate of 1% shall is added per floor of brickwork (taking each floor to be of av. 3m ht.)

26. First class brickwork in cement mortar 1 : 6 superstructure First floor.

Consider first 10 cu m *Unit=1cmm*

Calculation of Materials :- Cement 3.5/7 = 0.5 cu m; Sand = 0.5 x 6 = 3.0 cu m.

Labour Gang - (B) with additions as stated in the above note.

Particulars		Quantity	Rate Rs. P.	Amount Rs. P.
(a) Materials :-				
Bricks(kiln) 20 cm x 10 cm x 10 cm		5,000 nos.	2900.00 per‰nos.	14500.00
(For 25.4 cm x 12.7 cm x 7.6 cm) ..		4,100 nos.		
(For 22.90 cm x 11.4 cm x 7.6 cm).		5,000 nos.		
Sand (medium)	...	3 cu m	300.00 per cu m	900.00
Cement =0.5 cu m = 15 bags	...	15 bags	180.00 per bag	2700.00
Scaffolding ...	...	L. S.	L. S.	120.00
(b) Labour :- Head Mason	...	1/2 no.	125.00 Each per day	62.50
Mason	...	9 nos.	115.00 Each per day	1035.00
Mazdoor (2 nos. as Bhisti)	...	20 nos.	80.00 Each per day	1600.00
Contingencies, T. & P. etc.	...	L.S$\frac{1}{2}$%(a+b)	L. S.	104.50
			Total =	21022.09
(c) Water charge :-	...		1% of the total =	210.22
			Total =	21232.3
(d) Profit and Overhead :-	...		10% of the total =	2123.2

∴ Rate per cu m = Rs. 2335.55 GrandTotal = Rs. 23355.5

27. Second class brickwork in cement mortar (1 : 6) in foundation and plinth.

Consider first 10 cu m *Unit = 1 cum*

Calculation of materials is same as item no. 24. Only reduce the Labour - head . Number of labours Mason = 7 nos., Mazdoor = 14 nos.(2 nos. as Bhisti) others are the same.

Value :- Value means its worth or utility. Value varies time to time & depends largely on the supply of that particular type of property & the extent of the demand for it. The cost of construction of a building may have no relation to the value of the same if sold in the open market. The value of a property within a short time may be more like double than the cost of construction when there are more buyers for that type of property & vice-versa.

The value depends on (i) its utility
(ii) scarcity
(iii) events.

Cost :- Cost means the original cost of Construction & can be known after accounting all day-to-day expenditure from the very planning stage till the Construction is completed. The cost of an old building becomes less due to its age & changes in fashion. For valuation purpose the cost of an old building is worket out from the present cost of Construction of such a new building less the calculated amount of loss of the building due to its wear & tear.

Price:- This is an amount worked out adding the cost of production, interest on investment, reward to the producer for his labour and risk. Thus the selling price is fixed for a commodity. For less demand the selling price may have to be fixed lower & vice-versa.

What is Valuation?

Valuation is the art of assessing the present fair value of a property at a stated time. Valuation of anything is an estimate of the value of that thing in terms of money. It only attempts at suggesting the fair prices. Yet, valuation is not an arbitrary process. It is based on certain facts & only after a judicious processing of such facts & indications, we can suggest the value or fair price of the property.

Rises & falls of the fair price can occur in a very short space of time. It follows therefore that all valuations must clearly state the date to which the valuation relates, since time is the essence of all valuations.

Income Tax:- The income from landed property, equally with that from other sources, is subject to income tax, which is assessed in accordance with the rules of the Income Tax Act.

Net Income:- Net income is the gross income less all outgoings which includes the taxes, premiums, repairs, insurance, management & collation charges, loss of rent, ground rent, sinking fund etc. necessary to maintain the property in a state, to command that income.

Perpetual Income:- The income receivable for an indefinite period is known as perpetual income. Provision of sinking fund for redemption of capital is not required.

Deferred Income:- The income receivable after a lapse of certain period is termed as deferred

Scrap Value:- Scrap value is the value of dismantled materials of a property at the end of its utility period, & absolutely useless except for sale as scrap. When

which has outlived
of life & repairs
not viable, a certai
got by selling th
like, bricks, steel, woode
less cost of demolitio
The scrap value of a
considered as to perce
construction. Thus in
machine which does not
or becomes obsolete
again by repairing or
parts, the value o
by selling the machine
in parts is known
scrap value is also
or Demolition value. O
value may be zero
the cost of dismantl
equal or more than

Salvage value:- it
value of a built
of its useful life
This is generally a
the depreciation fu

But there are
is of sizable amou

... in functional size) Required

which has outlived, it's useful span of life & repairing for re-use is not viable, a certain amount can be got by selling the old useful materials like, bricks, steel, wooden articles, etc. less cost of demolition of the building etc. The scrap value of a building is usually considered as 10 percent of the cost of construction. Thus in the case of a machine which does not give useful service or becomes obsolete & can't be used again by repairing or replacement of parts, the value obtained at that time by selling the machine in one unit or cut in parts is known as scrap value. The scrap value is also known as junk value or Demolition value. On many occasions scrap value may be zero or even negative if the cost of dismantling or removal becomes equal or more than the scrap value.

Salvage value :- it is the estimated value of a built up property at the end of its useful life without being dismantled. This is generally accounted by deducting the depreciation from its new cost.

But there are times when salvage value is of sizable amount. & there are other times when it is a minus quantity.

(3) Scrap value is counted in the calculation of depreciation of a property at the end of the useful life & usually this is considered for of the cost of the structure on an item-by-item basis

(3) Scrap value of an asset is merely sale of scrap & has a limitation.

(4) Scrap value is not counted as a minus quantity.

(1) Ordinarily the salvage value factor in the calculation of depreciation is omitted by accounting scrap value.

(3) salvage value deposition may take the form of a sale of the asset to a purchaser who will continue to use it for the function for which it was originally designed. In this case salvage value dominate scrap value in the calculation of depreciation.

(4) There are times when it is a minus quantity.

property is the value at which it can be sold in the open market at a particular time. 'In the open market' means the property is offered for sale by advertising in daily News papers & all necessary steps are adopted so that every person who desires to purchase the same can made an offer. The owner willing & not obliged to sell might reasonably expect the price from a willing purchase with whom he was bargaining for the sale. So, market value must be free from forced value or sentimeter value.

Book Value:- Book value is defined as the value of the property shown in the account book in that particular year, i.e the original cost less the total depreciation till that year. Thus the book value of a property gradually reduces at a constant amount year after year up to the its utility period. Book Value is applicable on building & movable properties but not on land. This is usually required to determine the reserved price for court sale.

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⇒ Book value = original value − depreciation value

Market value	Book value
(a) The value is fixed by purchaser.	(a) The value is fixed by the rate of depreciation.
(b) The value may be higher during the subsequent years due to increase of price index.	(b) The value can't be higher during the subsequ year even due to increase of price index.
(c) The value may be constant for a period	(c) The value cannot be constant, rather there is a gradual fall.
(d) This is applicable to any type of property	(d) This is not applicable in case of land or metal articles like steel, Copper, Gold etc.
(e) Market value is considered for valuation.	(e) Book value is not variable due to its demand & supply or development of the area.
(f) This depends on forces of demand & supply, development of the area etc..	

Sinking Fund :- Sinking fund is an amount which has to be set aside at fixed intervals of time (say annually) out of the annual gross income so that at the end of the useful life of the building or property, the fund should accumulate to the initial cost of the property.

$$I = \frac{Si}{(1+i)^n - 1}$$

I = Annual sinking fund required.
S = Total amount of the sinking fund.
n = Number of years
i = Rate of interest on sinking fund expressed in decimal.

invest the same compound Interest for a period of 18 years in order to accumulate the total cost of Rs. 8,000/-.

Problem - 2

A person has purchased an old building at a cost Rs. 90.000 on the basis that the cost of land is Rs. 50,000 & the cost of building structure is Rs 40,000. Considering the future life of the year structure be 20 years, work out the amount of annual sinking fund at 4% interest when scrap value at life the cost of building structure.

Sol:

Scrap value = 10% cost of building structure = 0.10 × Rs. 40,000 = Rs. 4000

Depreciation :- Depre
in the value of th
use, life, wear, tear,
This is an assessment
wear & tear of t
property & is natur
original condition, qu
& mode of use. Thus
a building or property
decrease, gradually
period due to dep

$D = P\left(\frac{1}{n}\right)$

n = Number of year,
P = Total cost
d - use of

Obsolescence :-

$$D = P\left(\frac{100 - r_d}{100}\right)^n$$

r_d
100 - 1
50 - 2
25 - 4
20 - 5

n = Number of year.
P = Total cost
r_d - use of year.

Obsolescence :-

This may be defined as the loss in the value of the property due to change in fashions, in designs, in structure in adequacy to present or growing needs, necessity for replacement due to new inventions etc. An apartment which becomes increasingly difficult to rent out is said to suffer from obsolescence.

straight line method :-

In this method the property is assumed to lose value by a constant every year, & thus a fixed amount of original cost is written off every year so that at the end of the asset is worn out only the scrap value remains.

let C = Original Cost :- Sc = Scrap value:

n = life of the property in years.

D = annual depreciation by straight line method.

Annual depreciation = $\frac{\text{Original cost} - \text{Scrap value}}{\text{life in years}}$

i.e : $\boxed{D = \frac{C - Sc}{n}}$

problem - 1

The total cost of a new building is Rs. 1,50,000 assuming the life of the year is 80 years.

Soln

Annua
meth

Annual dep

Depreciati

∴ Depreciate
20 year

Soln

Annual depreciation by straight line method.

Annual depreciation =

$$= \frac{\text{Original cost - Scrap value}}{\text{life in years}}$$

$$= \frac{1,50,000 - 15,000}{80} = \text{Rs. } 1687.52$$

Depreciation for 20 years = Rs. 1687.50 × 20

= 33.750.00 Rs.

∴ Depreciated cost of the building after 20 years = 150,000 − 33,750

= Rs. 1,16,250/-