

GOVERNMENT POLYTECHNIC FOR GIRLS , AHMEDABAD

Civil Engineering Department

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*Subject:- Estimating, Costing and Valuation
Subject Code:- 3350604
Semester:- 5th
Year:2021*





- **Unit– IV**

Th and Lab

- **Estimation of Civil Works**

- **PART-B :**

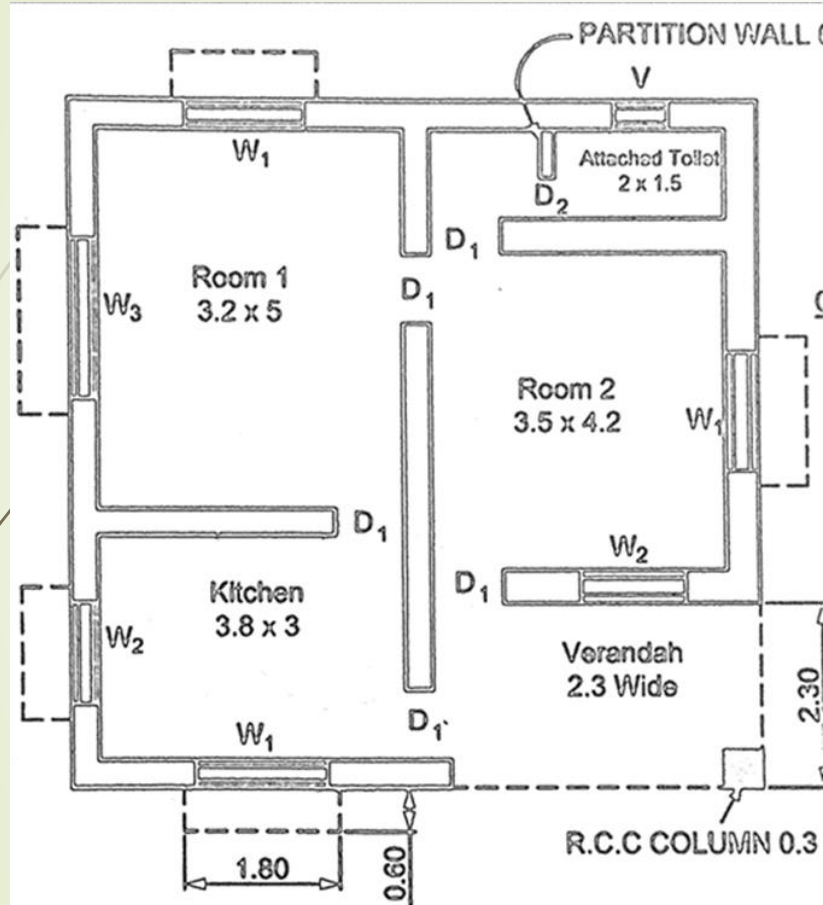
- **Detailed Estimation**

- **TERM WORK –PRACTICE -5**

Building Plan

and

Measurements



METHODS OF TAKING OUT QUANTITIES

OR Methods of Quantity Estimation

- ▶ The quantities like earth work, foundation concrete, brickwork in plinth and super structure etc., can be worked out by any of the following two methods:

I) Centre Line method.

(with wall junction consideration)

II) Long wall - Short wall method (LW & SW method)

OR

Out to Out and In to In method

LAB PRACTICES

EXAMPLES

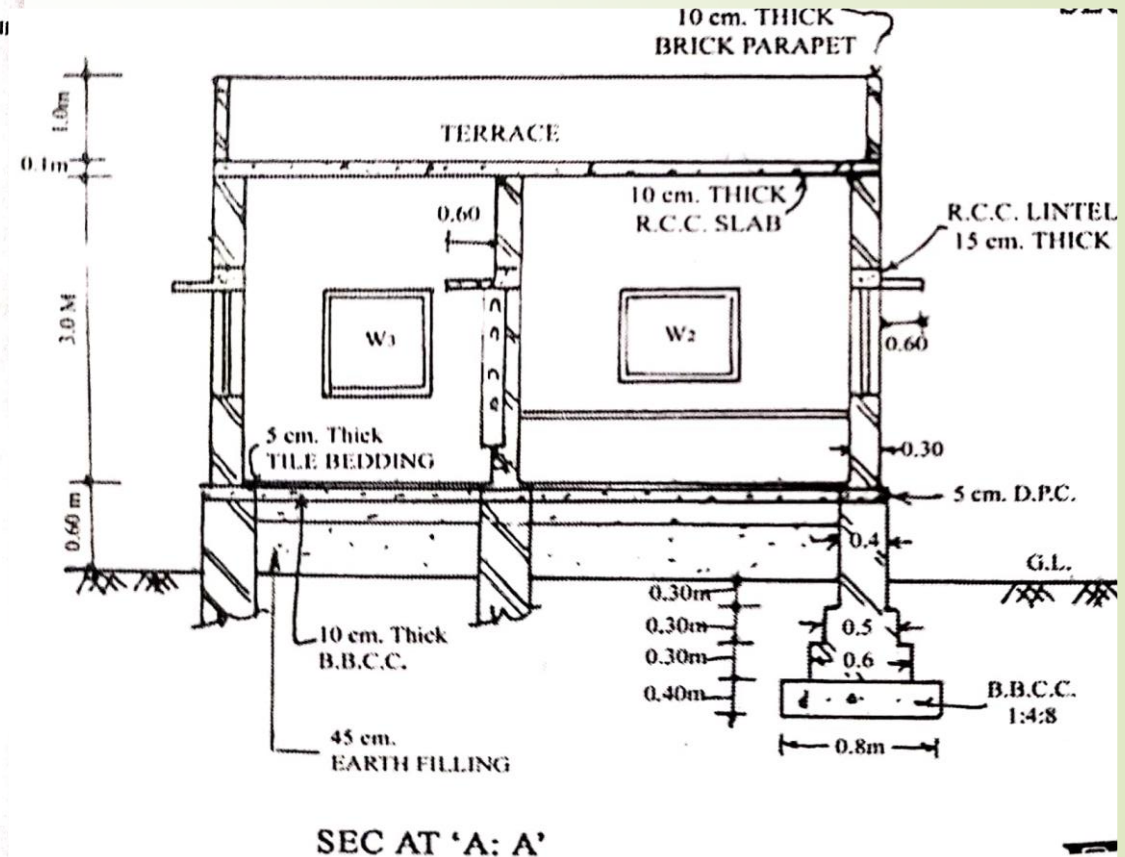
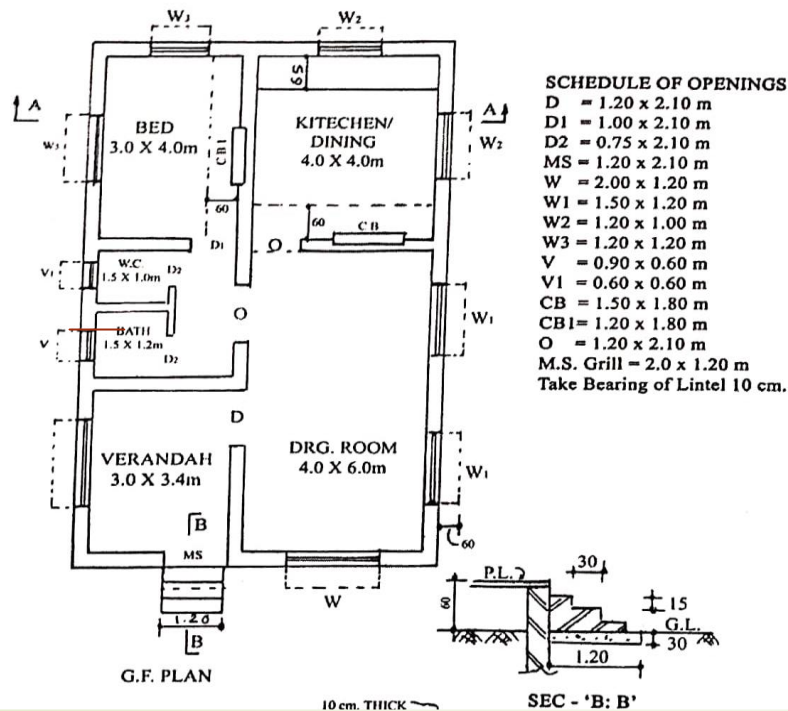


PART-B Detailed Estimation of a Single story Residential building

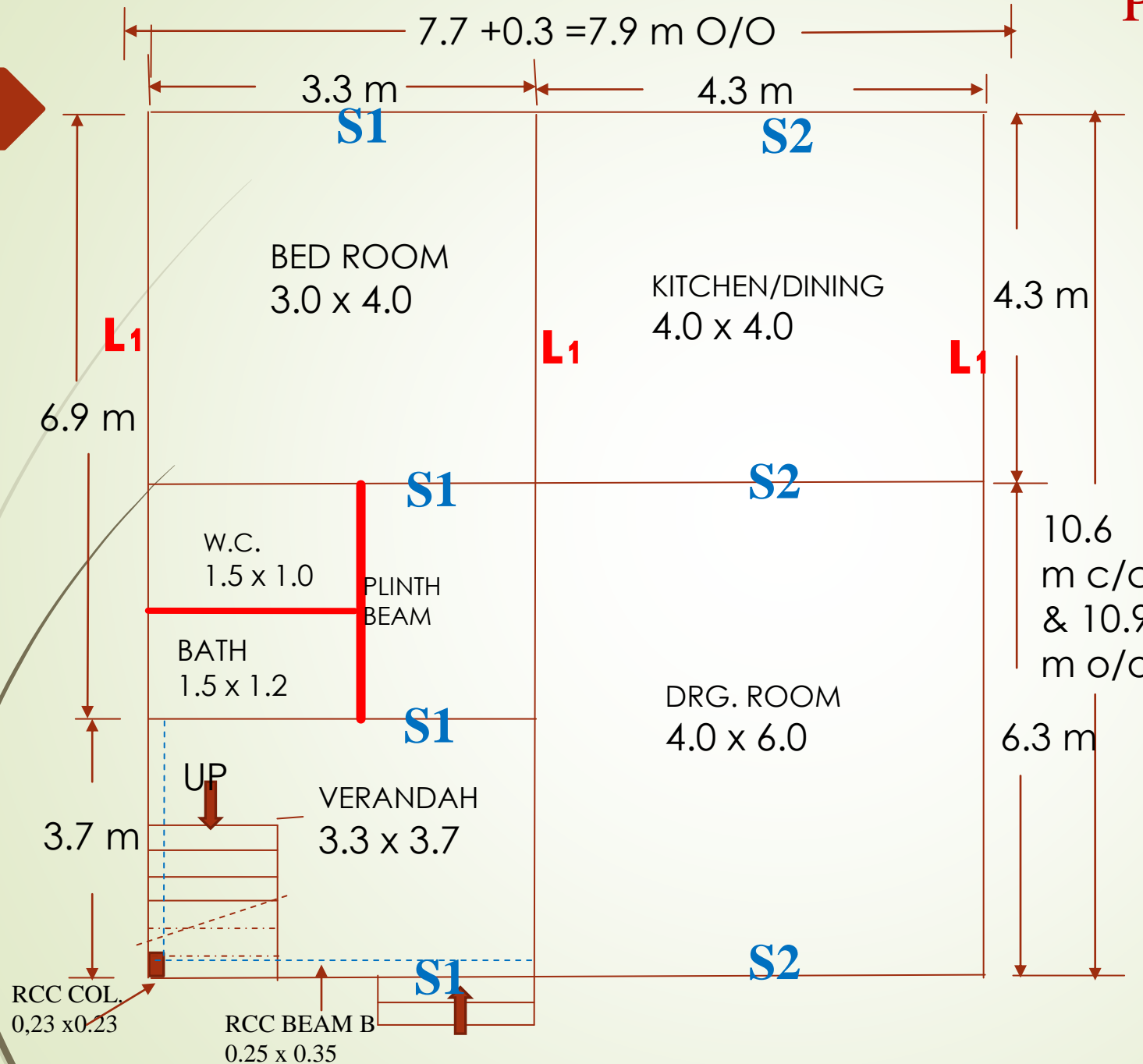
PART-(B)

The student will carry out the detail estimation of Single-story residential building form given drawing using S.O.R.

- Interpretation of given drawing
- Identifying the item of work and material with specification
- Finding the dimensions and quantities of item of works for sub and super structure
- Preparation of measurement sheet
- Use of S.O.R. and preparation of abstract sheet
- Finding total construction cost with all additional charges
- Finding the unit rate of construction per sq. m.



PART-B Solution



1. C/L Method: Total C/L =
 $H = 3.3 \times 4 + 4.3 \times 3 = 26.10$
 $V = 10.6 \times 3 = 31.80$
 ~~$= 57.90$ m~~

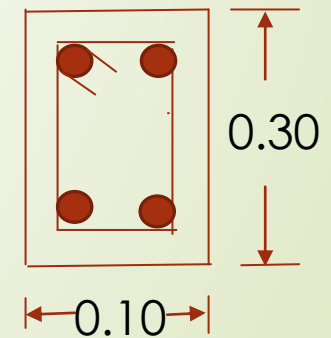
No. of Junctions = $N_j = 8$

2. L/W & S/W Method:

L/W : C/L $L1 = 10.6$ m c/c ,
 No. 3

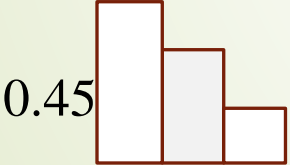
S/W : C/L $S1 = 3.3$ m, No. 4
 $S2 = 4.3$ m, No. 3

Plinth Beam: 0.10 m x 0.30 m



Detailed Estimate :

Sr. No.	Description	No.	Length (m)	Breadth (m)	Depth/Th. (m)	Qty.	Total Qty.
1	Excavation for foundation						
	L/W L1= 10.6 +0.8=11.4	3	11.4	0.8	1.3	35.568	
	S/W S1 = 3.3 -0.8 =2.5	4	2.5	0.8	1.3	10.4	
	S2= 4.3 -0.8=3.5	3	3.5	0.8	1.3	10.92	57.36
	For front step	1	1.2	1.2	0.3	0.468	Cu.m.
	C/L method : L= 57.9 -1/2x 0.8 x 8	1	54.7	0.8	1.3	56.89	57.36
	For front step	1	1.2	1.2	0.3	0.468	Cu.m.
2	BBCC (1:4:8) in foundation	1	54.7	0.8	0.4	17.50	17.97
	For front step	1	1.2	1.2	0.3	0.468	Cu.m.
3	1 st class brick masonry in 1:6 CM for foundation (a) Up to GL						
	L/W 1 st coarse L =10.6 +0.6	3	11.2	0.6	0.3	6.048	
	2 “ L= 10.6+ 0.5	3	11.1	0.5	0.3	4.995	
	3 “ L=10.6 + 0.4	3	11.0	0.4	0.3	3.96	

Sr. No.	Description	No.	Length (m)	Breadth (m)	Depth/Th. (m)	Qty.	Total Qty.
	S/W S1, 1 st coarse L=3.3 -0.6	4		0.6	0.3	1.944	37.84 Cu.m.
	2 " L = 3.3-0.5	4		0.5	0.3	1.68	
	3 " L= 3.3 -0.4	4		0.4	0.3	1.392	
	S2 1 st coarse L= 4.3 -0.6	3		0.6	0.3	1.998	
	2 L= 4.3 -0.5	3		0.5	0.3	1.71	
	3 L= 4.3 -0.4	3		0.4	0.3	1.404	
	(b) above GL TO PL					25.13	
	L/W L1, L = 10.6+0.4	3	11.0	0.4	0.55	7.26	
	S/W S1 , L = 3.3-0.4	4	2.9	0.4	0.55	2.552	
	S2 , L = 4.3 -0.4	3	3.9	0.4	0.55	2.572	
	FOR steps	1	1.2	0.3	0.45	0.162	
		1	1.2	0.3	0.3	0.108	
		1	1.2	0.3	0.15	0.54	
						12.68	
4	Back filling in foundation trench Qty.of item no 1-2-3(a)=57.36-17.97-25.13	--	--	--	--	14.26	14.26 Cu.m.
5	D.P.C. 5cm Th. at plinth level						

Sr. No.	Description	No.	Length (m)	Breadth (m)	Depth/Th. (m)	Qty.	Total Qty.
6	Earth filling in plinth for all rooms						
	Drg Room	1	5.90	3.90	0.45	10.35	30.26 Cu.m.
	Bed room	1	2.90	3.9	0.45	5.89	
	kit/din	1	3.9	3.9	0.45	6.84	
	Verandah	1	2.9	3.3	0.45	4.306	
Bath/ w.c	1	2.9	2.2	0.45	2.871		
7	BBCC(1:5:10) for flooring						
	Drg Room	1	5.90	3.90	0.1	2.301	6.42 Cu.m.
	Bed room	1	2.90	3.9	0.1	1.31	
	kit/din	1	3.9	3.9	0.1	1.21	
	Verandah	1	2.9	3.3	0.1	0.957	
Bath/ w.c	1	2.9	2.2	0.1	0.638		
8	Tile flooring in room and passage						
	Drg Room	1	6.00	4.00	--	24.0	
	Bed room	1	3.00	4.00	--	12.0	
	kit/din	1	4.00	4.00	--	16.0	
	Verandah	1	3.0	3.4	--	10.2	
passage	1	2.2	1.4	--	3.08		

Sr. No.	Description	No.	Lengt h L (m)	Breadt h B (m)	Depth/ Th. (m)	Qty.	Total Qty.	
10	1 st class Brick masonry 1:6CM in super structure L/W L1 = 10.6+0.3	3	10.9	0.3	2.85	27.664	39.10 Cu.m.	
	S/W S1 L= 3.3 -0.3	4	3.0	0.3	2.85	10.26		
	S2 L= 4.3 -0.3 (h=3.0-0.15=2.85)	3	4.0	0.3	2.85	10.26		
								48.184
	Deduction for opening	Door D	1	1.2	0.3	2.1		0.756
		D1	3	1.0	0.3	2.1		1.89
		O	1	1.2	0.3	2.1		0.432
	Window	W	1	2.0	0.3	1.2		0.72
		W1	4	1.5	"	1.2		2.16
		W2	1	1.2	"	1.0		0.36
		W3	1	1.2	"	1.2		0.42
		V	1	0.9	"	0.6		0.24
		MS GRILL	1	2.0	"	1.2		0.72
		MS Door	1	1.2	"	2.1		0.42
	CB	1	1.5	0.20	1.8	0.540.		
	CB1	1	1.2	0.20	1.8	0.432		

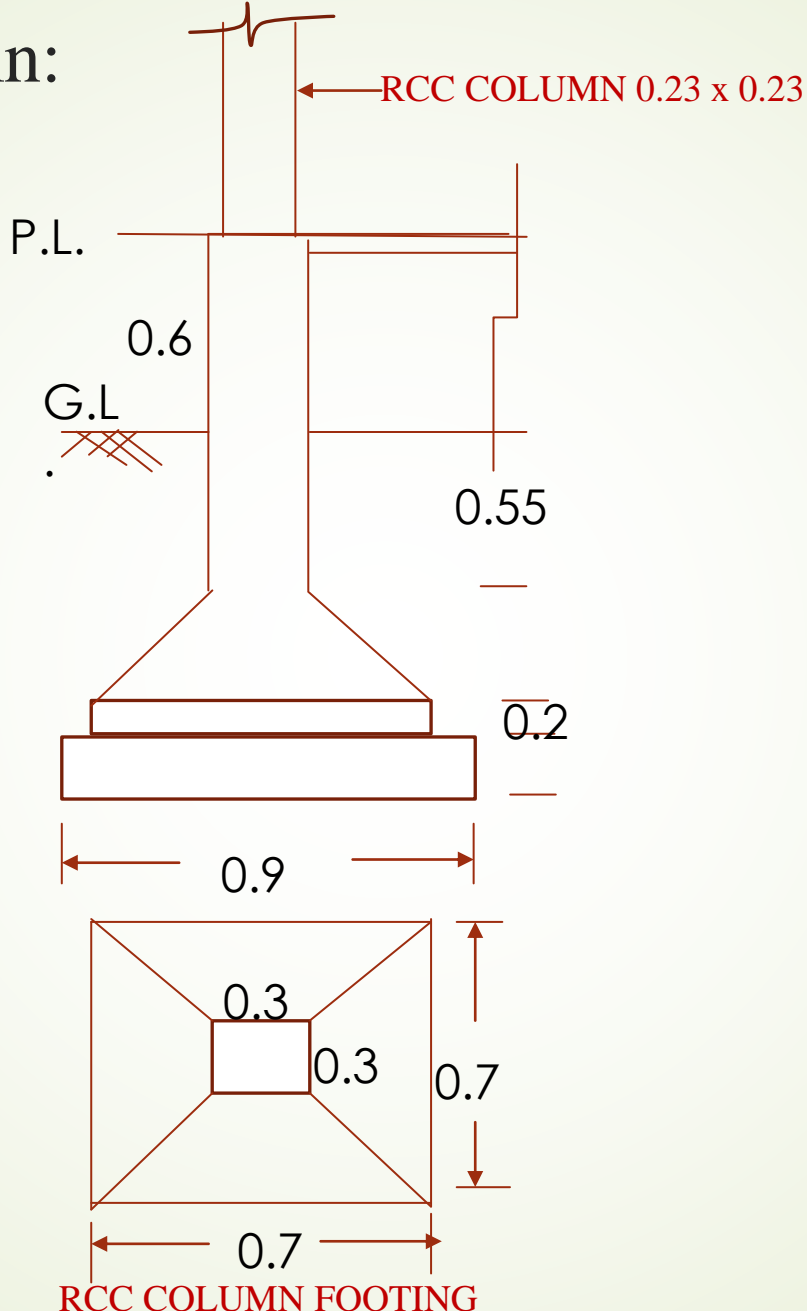
Sr. No.	Description	No.	Lengt h L (m)	Breadt h B (m)	Depth/ Th. (m)	Qty.	Total Qty.
11	12mm th smooth cement plaster (1:4CM) On wall						
	Drg. Room	2	4.0	-	3.0	24.0	
		2	6.0	-	3.0	36.0	
	Bed room	2	3.0	-	3.0	18.0	
		2	4.0	-	3.0	24.0	
	Kitchen	2x2	4.0	-	3.0	48.0	
	Verandah	1.5	3.3	-	3.0	14.85	
		2	3.7	-	3.0	22.2	
	Passage	2	1.4	-	3.0	8.4	
		2	2.3	-	3.0	13.8	
						<u>209.25</u>	
	DEDUCTION						
	: Doors D	1	1.2	-	2.1	2.52	
	O	2	1.2	-	2.1	5.04	
	D1	1	1.0	-	2.1	2.10	
	D2	2X1/2	0.75	-	2.1	1.575	
	Window W	1x1/2	2.0	-	1.2	1.20	
	W1	4x 1/2	1.5	-	1.2	3.60	189.14
	W2	1 x1/2	1.2	-	1.0	0.60	Sq.m.

Sr. No.	Description	No.	Lengt h L (m)	Breadt h B (m)	Depth/ Th. (m)	Qty.	Total Qty.		
12	10 cm th partition: wall for parapet V: $L = 6 + 4 + 3 \times 0.3 = 10.9$ H: $L = 3 + 4 + 3 \times 0.3 = 7.9 - .20 = 7.7$ Bath WC partition wall	2	10.9	-	1.0	21.8	38.75 Sq.m.		
		2	7.7	-	1.0	15.4			
		1	1.5	-	3.0	4.5			
		1	2.3	-	3.0	6.9			
								48.6	
		DEDUCTION: Stair cabin h=	1	3.0	-	1.0		3.0	
		v=	1	3.7	-	1.0		3.7	
		Door D2	2	0.75	-	2.1		3.15	
								9.85	
13	P/F Doors ,Windows and Ventilator	Door D	1	1.2	--	2.1	2.52		
		D1	1+1	1.0	--	2.1	4.2		
		D2	2	0.75	--	2.1	3.15		
		Window W	1	2.0	--	1.2	2.4		
		W1	2	1.5	--	1.2	3.6		
		W2	2	1.2	--	1.0	2.4		

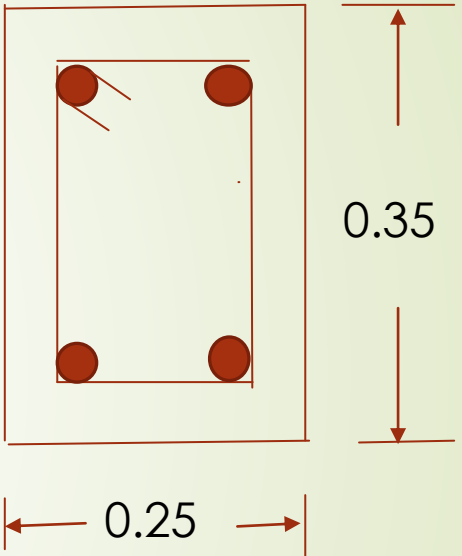
Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth / Th. (m)	Qty.	Total Qty.		
14	M.S. Work	MS Door	1	1.2	--	2.1	2.52	10.17 Sq.m.	
		MS Grill	1	2.0	--	1.2	2.40		
		Window Grill	7 x3	0.25	--	1.0	5.25		
15	20mm Th. sand faced two coat plaster on outside wall (H=0.6+3+0.1+1=4.7m) front and back wall	side wall	2	10.9	-	4.7	102.46	197.50 Sq.m.	
			2	7.9	-	4.7	74.26		
		Bath	2	1.5	-	3.0	9.0		
			2	1.2	-	3.0	7.2		
		WC	2	1.5	-	3.0	9.0		
			2	1.0	-	3.0	6.0		
							207.92		
	Deduction:	Window	W	1x1/2	2.0	-	1.2		1.2
			W1	4 x 1/2	1.5	-	1.2		3.6
			W2	1 x1/2	1.2	-	1.0		0.6
			W3	1 x1/2	1.2	-	1.2		0.72
			V	1 x1/2	0.9	-	0.6		0.27
			MS Door	1 x1/2	1.2	-	2.1		1.26
		MS Grill	1 x1/2	2.0	-	1.2	1.2		
		Door D2	2x1/2	0.75	-	2.1	1.575		

Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.
16	RCC Slab(1:2:4) 10 cm th , Slab size	1	10.9	7.90	0.10	8.61	8.06 Cu.m.
	Deduction: Stairs	1	2.5	2.2	0.1	0.55	
17	RCC Column	1	0.7	0.7	0.2	0.098	0.50 Cu.m .
	(i) Up to plinth level:Base: Trapezoid sec. $V = h/6 [A1 + A2 + 4A_m]$ A1(top)= 0.3 x 0.3=0.09 A2 (Bottom)=0.7 x0.7=0.49 V= 0.45/6[0.09+0.49+4 x 0.29]	1	--	--	--	0.131	
	stem upto GL	1	0.3	0.3	1.15	0.104	
	(ii)Above PL-stem	1	0.23	0.23	3.10	0.163	

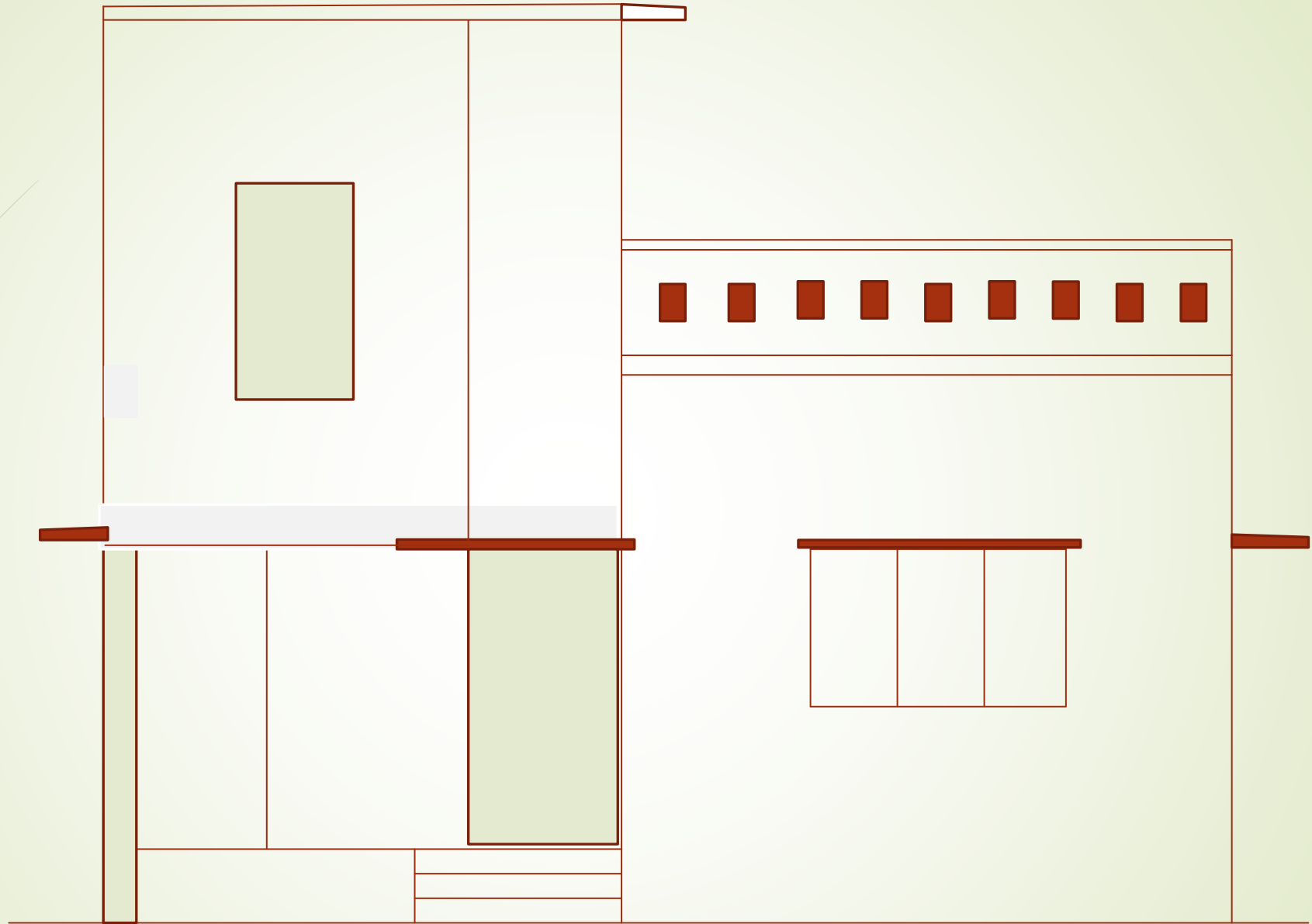
R.C.C. Column:



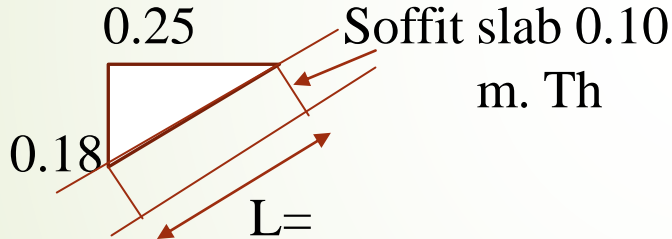
R.C.C. Beam: B



@ Slab and Landing



FRONT ELEVATION

Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.
18	R.C.C. Beam (0.10 x0.30) Plinth b	1	2.9	0.10	0.30	0.087	0.752 Cu.m
	L=2.3 +2 x0.3= 2.9	1	1.8	0.10	0.30	0.054	
	L= 1.5 +0.30 =1.8	1	3.6	0.23	0.35	0.289	
	Main Beam B	1	4.0	0.23	0.35	0.322	
19	R.C.C. Stairs as per calculation						1.16 Cu.m.
	 <p>0.25 Soffit slab 0.10 m. Th</p> <p>0.18</p> <p>L=</p> <p>$L = \sqrt{(0.18)^2 + (0.25)^2} = 0.309$</p>						
	Qty. 1 step = soffit + step	16	0.309	1.0	0.12	0.592	
	Steps	16	1.0	$A = \frac{1}{2} \times 0.18 \times 0.25 = 0.0228$	--	0.365	
	landing	1	2.2	0.77	0.12	0.203	

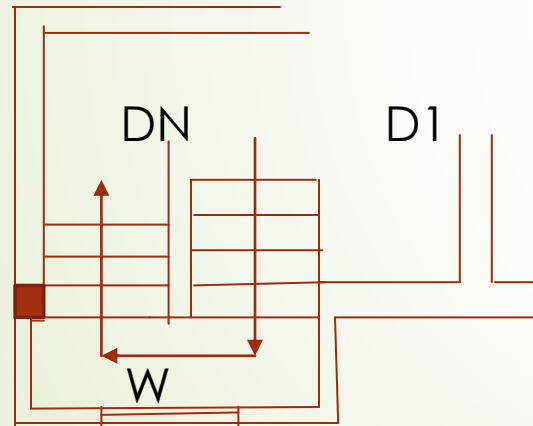
Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.
20	R.C.C. Lintel, Chajja ,Lofts						
	Lintel : $L = 57.9 - \frac{1}{2} \times 0.30 \times 6 =$	1	57.0	0.3	0.15	2.565	
	Chajjas $W = L = 2.0 + 0.20 = 2.2$	1	2.2	0.6	0.075	0.099	
	$W1 = 1.5 + 0.2 = 1.7$	4	1.7	0.6	0.075	0.306	
	$W2, W3 = 1.2 + 0.2 = 1.4$	2	1.4	0.6	“	0.126	
	Entrance step	1	1.4	0.6	“	0.063	3.46
Lofts : Kitchen, Bed	1x2	4.0	0.6	“	0.36	Cu.m.	
21	Flooring on RCC steps						
	$B = 0.18 + 0.25 = 0.43$	16	1.0	0.43	--	6.88	
		3	1.2	0.43	--	1.548	8.43
	Main front entrance						Sq.m.

Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.		
22	15 cm ht Skirting	Drg room	2	4.0	--	--	8.0	57.5 Rmt.	
			2	6.0	--	--	12.0		
		Bed	2	3.0	--	--	6.0		
			2	4.0	-	--	8.0		
		Kitchen	2	4.0	--	--	8.0		
			2	4.0	--	--	8.0		
		Verandah	2	3.3	--	--	6.6		
			2	3.7	--	--	7.4		
		Passage	2	2.3	--	--	4.6		
			2	1.4	--	--	2.8		
									71.4
			Deduction :Door D	1x 2	1.2	--	--		2.4
			O	2x 2	1.2	--	--		4.8
			D1	2 x2	1.0	--	--		4.0
	D2	2 x1	0.75	--	--	1.5			
	MS Door	1	1.2	--	--	1.2			
						13.9			
23	P/L Kitchen platform 60 cm wide	1	4.0	--	--	4.0	4.0 Rmt		

Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/ Th. (m)	Qty.	Total Qty.
24	12 mm Th plaster work on RCC work	1	--	0.92	3.0	2.76	100.83 Sq.m
	Column	1	--	0.92	3.0	2.76	
	B= 0.23 x4 =0.92						
	Beam B=0.25 + 2 X0.35= 0.95	1	3.0	0.95	--	2.85	
		1	3.4	0.95	--	3.23	
	Chajjas :						
	Window W	1	2.2	1.275	--	2.805	
	W1	2	1.7	1.275	--	4.335	
	W2	2	1.4	1.275	--	3.57	
	W3	2	1.4	1.275	--	3.57	
	Entrance (b = 0.6 + 0.6+ 0.075)=	1	1.4	1.275	--	1.785	
	Room ceiling	1	6.0	4.0	--	24.0	
	Drg.Room	1	3.0	4.0	--	12.0	
	Bed	1	4.0	4.0	--	16.0	
Kitchen	1	3.0	3.4	--	10.2		
Verandah	1	1.5	1.2	--	1.8		
Bath	1	1.5	1.0	--	1.5		
WC	1	2.3	1.4	--	3.22		
Passage	1	5.0	1.0	--	5.0		
Stari soffit slab	1	2.2	1.0	--	2.2		
Landing bottom	1						

Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.
25	P/F with whitewash in two coat on wall and RCC work = total qty of plaster on wall and RCC work=189.14+197.50+100.83	1	--	--	--	487.47	487.50 Sq.m.
26	P/L 25mm Th . Water proofing CC on terrace main slab	1	10.7	7.70	--	82.39	68.33 Sq.m.
	Deduction: Cabin slab	1	3.8	3.7	--	-14.06	

Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.	
1.	First floor:							
	Brick work 20 cm h Stair cabin, Side	2	4.0	0.20	2.10	3.36	3.15 Cu.m.	
	Back	1	3.0	0.20	2.10	1.26		
	Front cabin	1	1.0	0.20	2.10	0.42		
	Deduction: D1	1	---	0.90	2.10	1.89		
2.	Partition wall Front side (L= 2.2 + 0.8=3.0) Cabin Perapat	1	3.0	--	3.0	9.0	21.78 Sq.m.	
		1	14.8	--	0.9	13.32		
								22.32
		Deduction W4	1	--	0.45	1.20		0.54


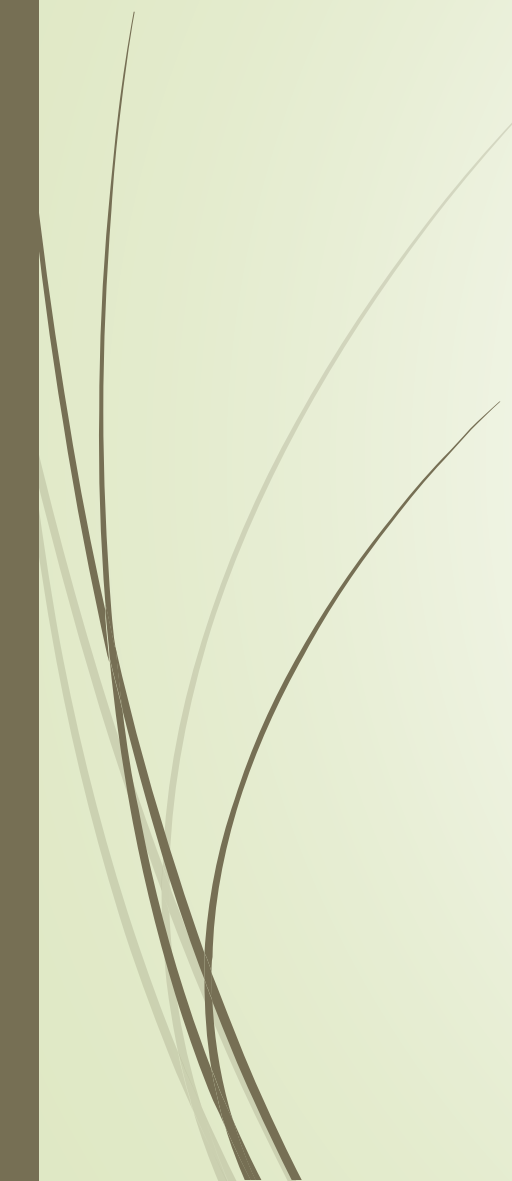


Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.		
3.	12mmTh smooth cement plaster on cabin wall (inside) side Partition wall Deduction: D1 W4	2	3.4	--	2.10	14.28	30.77 Sq.m.		
		1	3.0	--	2.10	6.3			
		1	3.8	--	3.00	11.4			
								31.980	
		1/2x1	--	0.90	2.10	0.945			
		1/2x1	--	0.45	1.20	0.47			
						1.215			
4.	20mm Th rough plaster outside of wall side back partition wall Deduction: D1 W4	2	4.0	--	2.20	17.6	37.51 Sq.m.		
		1	3.4	--	2.20	7.48			
		1	4.4	--	3.10	13.64			
								38.72	
		1/2x1	--	0.90	2.10	0.945			
		1/2x1	--	0.45	1.20	0.47			
						1.215			
5.	RCC Lintel W4	1	0.75	0.40	0.10		0.03 Cu.m.		

Sr. No.	Description	No.	Length L (m)	Breadth B (m)	Depth/Th. (m)	Qty.	Total Qty.
6.	RCC Slab 10 cm Th. on stair cabin above landing	1	4.0	3.9	0.10	1.56	1.8 Cu.m.
		1	2.4	1.0	0.10	0.24	
7.	Ceramic Tile flooring in stair cabin	1	3.4	1.0	--	3.4	6.15 Sq.m.
		1	2.2	1.25	--	2.75	
8.	Whitewash two coat in cabin As per plaster work	--	--	--	---	---	68.28 Sq.m.
9.	P/L Water proofing CC on stair cabin	1	3.8	3.7	--	14.06	14.06 Sq.m.
10	P/F door and window	1	0.9	--	2.1	1.89	2.43 Sq.m.
		1	0.45	--	1.2	0.54	

Abstract Sheet: Detailed Estimate of single storey Resi. building-(G.F.)

Sr. No.	Description	Qty.	Rate		Unit	Amount	
			Rs.	Ps.		Rs.	Ps.
1	Excavation for foundation trenches in ordinary soil up to 1.5m depth & 50m lead including trimming, finishing ,foundation trenches as desired etc. complete				Cu.m.		
2	Providing & laying BBCC (1:4:8) for foundation concrete including placing, compacting ,, finishing curing etc. complete				Cu.m.		
3	Providing & laying 1st class brick masonry in (1:6 CM) in foundation including finishing, curing etc. complete				Cu.m.		
	Accordingly write all items of works with rate and unit, Find cost of that item						

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1. Prepare abstract sheet and enter qty. of item calculated as in measurement sheet for that item only in G.F.& F.F. separately.
 2. Write unit rate of item of work and find cost of that item of works
 3. Do as per sample abstract given for the practical example.
 4. Do same For first floor
 5. Do total of GF and FF for total approximate cost of construction

➤ Total construction cost=G.F.+ F.F.=

TOTAL Rs. 1390017.00

➤ Total built up area = G.F.= $10.9 \times 7.9 = 86.11$ Sq.m.

➤ Stair cabin= $4.0 \times 3.4 = 13.60$ “

$2.4 \times 1.0 = 2.40$ “

102.11 Sq.m.

AS from Abstract prepared ,

➤ Rate of construction = Total cost / total built up area
= $1390017 / 102.11 = 13612.94$

Say Rs. 13613.00 Rs. / Sq.m.

➤ App. Rate of construction = 13613.00 per Sq.m.



THANK YOU...