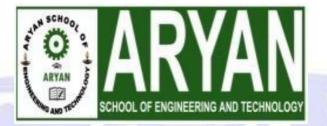
# **ARYAN SCHOOL OF ENGINEERING & ECHNOLOGY**

BARAKUDA, PANCHAGAON, BHUBANESWAR, KHORDHA-752050



# LECTURE NOTE

SUBJECT NAME- ESTIMATION & COST EVALUATION-I BRANCH-CIVIL ENGG. SEMESTER-3<sup>RD</sup> SEM ACADEMIC SESSION-2022-23 PREPARED BY- DIBYAJYOTI NAYAK i ak annual

Estimate: Before understaking the construction of a project dis necessary to know its probable cost which is worked out by estimating.

and expendeture likely to be incumited on the construction of a work.

the primary object of the estimate is to enable one to know before to determined theoretically by mathematically calculations based on the plane and alrawing and curricit rates Approximate estimate may be propared by various methode but accurate estimate is prepared by Detailed estimate method

Actual cost! The actual cost of a cost is known at the completion of the work. Amount of all expendeture is maintained by day to day during execution of work in the account section and at the end of the completion of work when the account is completed, the actual cost is known. The actual cost should be not dibber much brom the estimated cost worked out at the begining.

An estimate is the anticipated on probable cost of a work and is usually prepared before the construction is taken up. Bebone underlawing any work on project it is necessary to know its probable cost which is obtained one derived by estimating.

plinth Arrea Ectimate

buildings stoney on (at the blook level of the buildings basement) is called the plinth anea. It is the measure of a building's useable area.

It is also known as the burld-up area that is the whole area occupied by the building along with external and interinal walls. It is usually 10% to 20% higher than the carpet area.

It should be computed bore the enclosed area by measuring the external buildings olimensions at the blook level. The courcilized and other opens areas will not include in the plinth arrea. Floor Arrea

Floor arrea of a building is the total arrea of floor in between wall and consists of bloor of all rooms verendans passage considers room, entrance halls kitchen, storres, bath and latriene (W.a) etc. Sills of doors and openinge arre not included in the Floor Arrea.

Floor Anca is equal to plenth area minus area occupied by walls.

For deductions of wall area from plinth area to obtain bloor area shall include - (i) Door and other openinge in the wall, fi) Intermediate plans and supporte Gii) pilasters along walls exceeding 300 sq.cm in area, iv) Flues with which are within i wall

Cinculation Amea: Conculation area is the bloor area of verindahs, passage, coundous balconics, entrance hall, porches, staincase, etc. which are used bon movements of persons using the building. The cinculation area of any blook shall compromise of the tollowing.

(e) Verindahs and balconies, & Passages and conridons, () Entrance halls, e) staincase and munities, (c) shabts bort lift in dedait and -almynt na

The concludation area may be divided into two parts w) Horizontal cinculation area and (3) Ventical conculation area. Horizontal circulation Area.

Horcizontal arrea of a building is the arrea of Verindahs, passage movement of the users of the building. This may be 101. to 151. of the plinth arrea of the building. Verdicel Circulation Arrea

Ventical cinculation anea ob a building is the arrea on space occupied by staincases, libts and the entrance halls adjacent to them which and nequeined box ventical movement of the users of the building. This may be 47. to 57. of the plinth arrea of the buildings. Campet Arreas

Canpet Anea of building is the usebul anea on liveable anea on Lettable anea. This is the total blouri anea minus the Cinculation anea, venandahs, connedors, passages, staincase, lifts, entrance hall, etc. and minus other non-weable aneas at sanitary accomodations, air condition room etc For office building canpet anea is the lettable anea on useable anea and born nesidential building canpet anea is the liveable anea on useable should exclude the kitchen, panting, stones and similar other room which are not used born tiving purposes.

Units of medisurrements in metric system

Units of dimensions bor materials and work
Particularis of Materials and Works Dimensions metricsystem
<ul> <li>I. Brucks, stone blocks, etc.</li> <li>Files, slates, wall board, glass panes, A.C. sheets. → All dimensions cm sheets etc.</li> <li>Boort, windows etc.</li> <li>A. C. sheets. → Length and breadth in cmore m.</li> <li>S. Doort, windows etc.</li> <li>A. Parts ob doors and windows as panels shulfer.</li> <li>Timberi</li> <li>Timberi</li> <li>Timberi</li> <li>Assonity concrete, stone masonity setc.)</li> <li>And breadth in cmore m.</li> <li>Cement concrete, time concrete, R.C. flooring, otc.</li> <li>Length and breadth in cm.</li> <li>Thickness in cm.</li> <li>Cement concrete, time concrete, R.C. flooring, otc.</li> <li>Length and breadth in cm.</li> <li>White washing, colour washing. Distempering printing, efc.</li> <li>Aggregates, ballast, gruit, sand, etc.</li> <li>Rolled steel sections as I-brain, channet, angle etc.</li> <li>Length in m., Dia, in m.</li> </ul>

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# Units of measurements and payements bor various items of warrise and materials

No maduchament payement	Payement
D FRETCHDEDORCK IN MILS	IN FPS
1. Furthworth in excavation in oridinary and	
earthwork in mined sod with kankan	
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2. Rock excavation 3. Earthbilling in excavation in boundation (u.m. perry. eum)	1 cuti
1. Farchfilling in boundation triencher (um)	· cuft
5. Earthbelling in plinth	1. cu - f1
6. Eauthwork in banking, cutting in road and eum. percy cum	y. cuft
studigation channel (1.m. particular	1. cuft
7. Surchase driessing and levelling, cleaning	
8. Cutting of titles	PER NO
9. Puddling, puddle clay come	1/ cuft
10 Cand tilling	1
1. Quartinging of stone on boulder	Le en fr
12. Blasting of rock (Bluster stone stocked	
and their measurear	
Concrete per cuin	7. cutt
1. Line concriete in boundation 2. Line concriete in noot terracing, thickness can per sam	
specified	1.9.61
a compation and the for a line of the second s	per cu. ft
A. Reinbonced cement concrete (R.C.C) cum per cur	1
5. C.C. or R.C.C. chajja, sunshade cum	
	m per cuff
7. cement concrete bed cum per cu	m per clift
D.P.C perisgin perisgin	7.39,67
8. Damp privat course-cement concricte, Rich cement moritar, Asphalt, etc. in cement, lime or sqim	V
cement mortan, replace, de la anti-	
mud morelan	
J. Breickwork in boundation and plinth, in J. Breickwork in boundation and plinth, in cement cum per cum	y. cuff
en mare CHET MI HUILE III (MICHA)	
line on mud mortaut	n 1. cutt
o fundation brick work	n 17-59.6t
3. Honey-comb bruckwork, thickness specified sq.m per sq.m 4. Breickwork in jack arches, rf measured cu.m. per cu.m	1 / cuff
4. Separialely second day too tinisheng log m per sqm	
5 tack arech reading including the bind of strain	m 7- cc b+
L BRUCKWORK IN WEISKEITING	
	m 1. sqbt.
E. This parctition wall sque paisy	7-59,6-1
	I and the second se

Scanned by CamScanner

1

	S.I No	Particulary of Herore	Undi of measurements in MKS	A Unitiality powerment	Unitab poyement in FPS
	8.	This parchition wall	59.m	per sqm	7-59-61
	9.	Reinborred bruckwork (R.B. work)	cum	per cum	1. oufi
	10.	string course, drup course, weather course, coping etc (projection specific)	metre	per m	pennbl
	11.			per m	Veri rc bi
	12	Breickworck in Firre Mace, chulla, chinney	eu.m	per cum	1. cu.1+
		Perigetting chimney, fine place the Bruck edging	metre	perm	per re bi
		nework	meine	peam	per n bit
No. of the second second	1. E (0 WC	stone masonry, Rondom nubble mason unshed Rubble masonry, Ashlari masonry alls, in anches, etc	n) Cum	pencum	7. cuft
	3	(ut stone work in lintel, beam etc. Stone slab in Root, shelve, etc. stone chhaji	cum	per cum	y. cu.ft
	5.0	stone, sunshed etc.	5q.m.	per sq.m	7.59.61
	4.	stonework in wall bacing or lining	sq.m.	pen sq.m	pen sq.64
1	Wo	og worck			-
-	C	Nood Work, door & window brame on howkhat, trabfers, beams, roob trussog.	etr. cum	peneun	n pericutt
	t. ti	Soori and window shuttens on leaver, pan sattens, glazed, pand panelled and past gle since gauged, etc.	ized sq.m	per sq.m	pen sq.b.f
	3.[ •	Dook and window telfings as hinges to were liding bolk, handles etc.	boltino.	per no.	perno.
	4.	Timbering, boarding (Thickness specily	ied) sqim	per sq.m	per-sq.bf
	\$5.	Timberring of trienches	59.m	per squ	pensq.61
	6.	sawing of timber	59.10	per squ	1. pensq.bt
	7.1	woodwork in partition, plywood, dr	sq.m		
	8.	Ballies (Dia-specifixa)	metru	e per m	perit 61.
1		Rolled steel joists, channels, Angler, T-irro	ns quint	al per q	pen cwt
				_	per cwt
		steel neinboncements barrs etc. in RCC. R.F.			
	a.	Bending, binding of steel reinpolice	iont que		per Chil
	4.	Fabrucation and hoisting of strid word	U		
	5.	Expended Metal (X. p.M.) size spece dieg	59.1	n penson	
		Fabruic meintoncement, wure netfing	sq. quir		m persoft
		Inon work in struss' Grusset plate (Min nectorgular size from wh cut)	. quin		2 per cul
	81	Cutting of Iron Joists, channel	cn	n reacr	per cwt
	a.	Threading in Irion			en pertach
		(utting angles, Tres, platr	squ	m perso	cm pensach
	• •		,	1	V i inch

<ol> <li>Welding, solder of sheets, plates</li> <li>Borring holes in incos</li> <li>14. (ast Inton (C.I.) pipe, Dia specified</li> <li>S. Rivets, Bolts, and nuts, Anchorr bolts, Lewis bolts, Helding down bolt, etc.</li> <li>16. Barbed wire bencing</li> <li>17. Inton gate</li> <li>18. Inton hold bast</li> <li>19. Inton matiling (Height and type speci)</li> <li>20. Inton gnill, collapsible gate</li> </ol>	cm no. metrie quintal metrie sq.m quintal metrie	penm	pen inch pen no. pen bi pen cwi 7. m bi pen sq bi pen cwi pen n bi
al. steel doors and windowiltype etixin specified) 22. steel doors and windows (type and by			per 5964
Roobing I. T. Led noof Allahabad tile, Faizaba Mongalorie tile etc, including batter 2. (ountry lile root including bambooja 3. Connugated mon (G.C.I) root, Asbestos (A.C.) sheet root 4. Jlate rooting, timber rooting 5. Mud noot over and inclusive of tiles on 6. Ridges, valleye, gutters 7. Expansion, contraction on construction ju 8. (eiling-Tomber, A.C. sheet plain, cloth c placter on XPM, paste board etc. plastering, pointing and binishing	d tile in S bhi co consent bhick bhick m bhick m	qm perisqn gm perisqn gm perisq gm perisq gm perisq sq.m perisqn hetre perim sq.m perisqn	n 1.5964 m 7.5964 .m 7.5964 m 7.5964 m 7.5964 m 7.5964 penr64 penr64
<ul> <li>a. plastering - cement montar, Lime montar mud, etc. (Thickness, proportion specified)</li> <li>a. Pointing - struck, Flush, weather etc.</li> <li>a. Dadol thickness and type specified)</li> <li>4. Skircting (Thickness type and height specified)</li> <li>4. Skircting (Thickness type and height specified)</li> <li>5. Cement montax on time montax nubbring. Colour washing, cement washing, colour washing, cemer washing (No. of coat specified)</li> <li>7. Distempening (No. of coat specified)</li> <li>8. Snow cement washing ore timisting</li> <li>9. painting testers and bigure (Ht. specified)</li> </ul>	s ecibied) 1 ng s nf s so so so so so	in pens iq.m pens q.m pens metre pens q.m pensq g.m pensq j.m pensq j.m pensq q.m pensq in pensq no. pens	52m 7-5964 jim 7:59-64 m per r 64 jim 7:59:64 m 7:59:64 m 7:59:64 m 7:59:64 m 7:59:64 m 7:59:64 m 7:59:64

12. Orting and cleaning of doors and windows 13. Coal taxing (No. 12 coal specified) 14. Removing of paint on vannish	sqm sqm	per 29.00 per 29.00 per 29.00	7.59.61 7.59.61 7.59.61
15. Globri Lapping (row dury wash)	9.m	per eqm	7.59.61
Floorcing 1. 2.5 cm (1") (.c. over 7.5 cm (3) L.c. Flutr (including L.c.) 2. Conglomentate fluor, antibicial patent store stoon 2.5 cm (1") (.c. over 7.5 cm (3") L.c. include		persqm persqm	7.59.6t 7.59.6t
3. 4 cm (15) thick stone Hoor Hag stone bloom over 7.5 cm (3) L.C. (including L.C) 4. 2.5 cm (1) marche blooring over 7.5 cm (s")	sq.m	per sq.m	
5. Mosaec on Lennazo on granolithic bloon over 7.5 cm (3) L.C. (in cluding L.C)	sq.m	pensq.m	pensq. 61
6. Brick blat floor over 7.5m (3") L.C. including L.C) 7. Bruck on edge Hoor over 7.5m (3) L.C. inclu	sq.n		
8. 2.5 cm (1) on 4cm (15) GC. HOOM	39.1		7.59.61
9. Mud blooning binished gobri lepping 10. Aprion on plinth protection 11. Doore and windowsill (c.c. on cement moritan plastenned)	sq.m sq.m sq.n	pen cq m pen sq.r	7.59.61 7.59.61

Method ob building estimate

EX.L Estimate the quantifies of bruckwork and plastering required in a wall 4 m long. 3m high and 30 cm thick. Calculate also the cost if the reate of breickwork is Re. 320.00 per cum and of plastering is Re. 2,50 per sq.m.

Quantity of bruckwork = LXBXH = 4mX3mX 0.30 = 3.6 (U.M. Quantity of plastering (two baces) = 2x LXH = ax4mX3m = 24 sqm. cost of bruckwork = 3.6x 320.00 - Re. 1152.00 east of plastering = 241.8.50 = Rs. 209.00 Total cost = 1152.00+ 204.00 - R1. 1136.00.

Ex. 2 Proparred a detailed estimate of part of a wall of a burilding brom the given plan and cection and generical specification (Figurand 2.2)

General specification

(i) Foundation concrete shall be ab lime concrete (a) Foundation and plinth shall be of 1 st class bruck work in lime

(3) Damp prioot (ourse- 2.5mm c.c. 1:13:3 with water prioobing

- (8) Superistrincture Ist class bruckwork in lime moretari
- (5) Wall trinishing. Inside wall 12mm cement plastered 1:6 and white wash 3 coats.

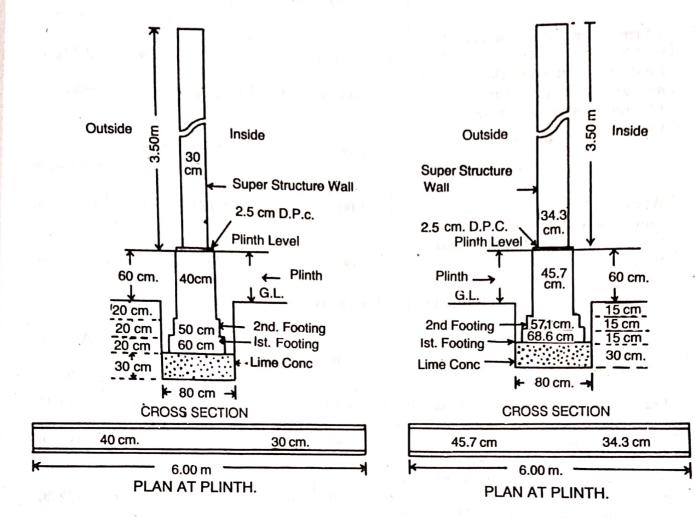
Plan and Section

Fig. 2-1

## WALL WITH STANDARD MODULAR BRICKS.

Fig. 2-2

## WALL WITH TRADITIONAL BRICKS.



Outside wall 12mm cement plasterred 1:6 including sound blow ground level and binished with 2 coal of colour wash over one coat of white washing.

3012-	N					0	
1410	Description of item of work	1No		rensions	11	Quantity - OIT	iora
No			Length	Britadith	Dept	content	1 quartin
۸.	Earthwork in exeavation in boundation	1	6.00m	0.80 m	o.gom	4.32	4.32 cur
2.	Lime concrete in foundation	1_	6.00m	0.80M	0.300	1.49	1.44 cum
3.	1st class bruckwork in line montax in toundation and plinth						
	1st booting	5		0.60 m	0.200	1	
	and booting plinthwall up to Gil.	1		0.50m		0.60	1
		1	6.00m	n n a start a s	11		
	plinthwall above Git.	T	6.000	0.40		0101:3.	24 cum
٩.	2.5 cm Damp ркооб соших (D. р.с) e-c. 1:15:3	1	6.00	0.400	-	2.4	2.459 0
5.	Let class brickwork in line monto	4 1	6.00m	0.30m	-	46.3	6.35q.m
6-	12mm plaster of cement sand 1:6 Inside	I	6.00	m -	3.50		
	outside including locm below		16.00	m -		25.2	
7.	white washing 3 coafs(inside)		6.00	m]-	70 3.50	21.0	259m) 21.059m
8.	colour washing 2 coats over	1			y.10 m	24.6	29.6 50.1
	concreat of white washing coutside above Gil.)	1	6.001	n - (n	9.10 .		
	,		1				
	ABSTRACT OF		TE CO	I			1
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1. E	ABSTRACT OF Description of Hemotwork Earthwork in excavation in soundation ime concriete in boundation with white lime, surchir and	ESTIMP Quantity	Unit	Rate Rs. 350.0	0 %	2UM 1	Rs.
1. Et 2. L. 4. 5. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	ABSTRACT OF Description of Hemotwork Earthwork in excavation in soundation ime concriete in toundation whete time, surchi and write ballost st class brickwork with whete ime and surchite mortan 1:0 in toundation and plinth	ESTIMA Quantity 9-32	Unit cu.m	Rate Rs. 1 350.0 1 220.0	0 % 0	2UM 1	Rs. 5·12
1. Et Luk 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 1. 1. 1. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2. 2.	ABSTRACT OF Description of Hemotwork Earthwork in excavation in soundation ime concriete in boundation with white lime, sunchi and price ballost of class brickwork with white ime and sunchi mortan 1:0 in boundation and plinth .5cm thick c.c. 1: 15:3 Damp prot ourse with water proobing compan	ESTIMA Quantity 9.32 1.44 3.24	cum cum	Rate Rs. 1 350.0 1 220.0 1 200.0	0 % 0 50 per UN pr	ricum :	Rs. 5.12 316.80
1. 2. 3. 1. 1. A. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	ABSTRACT OF Description of Hemotwork Earthwork in excavation in soundation time concriete in boundation with white lime, surchit and bruck ballost of class brick work with white ime and surchit mortan 1:0 n boundation and plinth from thick c.c. 1: 15:3 Damp prot	ESTIMA Quantity 9.32 1.44 3.24	Curr Curr Curr	Rate Rs. 1 350.0 1 220.0 1 300. m 20.0	0 % 0 50 per 00 pr 50 pr	ert cum	Rs. 5.12 316.80 972.00
1. Et Luk 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.	ABSTRACT OF Description of Hemotwork Earthwork in excavation in soundation ime concriete in boundation with white lime, surchit and brick ballost of class brickwork with white ime and surchit mortan 1:9. In boundation and plinth Scriptick c.c. 1:15:3 Damp prof owise with water proobing compare of class brickwork with white ime and surchit 1:2 mortan of superstructure	ESTIMA Quantity 9.32 1.44 3.29 2.4	Curr curr curr sq. cur	Rate Rs. 1 350.0 1 220.0 1 300. m 20.0	то 1/- со по рег иго Ри по Ри по Ри , сто Р	er cum en squ	Rs. 5.12 316.80 972.00 972.00 48.00 2016.00
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and the second s		Total : 3796.59	and the second se								
13.10											
Add bon wonkehanged Es	stablishment a	Gittond Idal = 398	6.27								
Method of building estimate											
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out the external length of roall	le europion !	in the longitudinal	denection								
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ofhaiside = centrie to centre lengthf short wall length in-to-in	n = centre to	o centrie lenger	in the crossle								
EX. 3.(a) Fig 23, the plan represent to my and s	of the plan	of superistincture w	allopasid								
EX. 3.(a) Fig 2:3, the plan represent representation of SMX4M, and s	PERIODE TICP	resent the enoss-sec	HONS OF THE								
recom building of Smithing, and											
wans went be			1								
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(2) Concrete in boundation	- nd plinth.	and									
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(1) Brickwork in superistring The length of long wall centric The length of short wall centric to	to centre = 5	5.00+ 5×0.30+ 5×0.30	) = 5.300)								
The length of long and centre to	centric = 7.07	ロチち×0.30+ち×0.30=	2.30%)								
	A JAN / Process	of Height Quantity Ex	plantony								
No Increased	m m	Dept	( )of C								
1. Earthwork in excavation in boundation -		0.90 10.04 1=	5-370.9-6-200								
Longioun 2 0	6.20 0.90	0.90 10.029 L=	4-30-0,90=3,400								
short wall 2 2	3.40 0.90	Total: 15.55.									
		curry									
2. Concrete in boundation- Longwall 2	6.20 0.90		ngth same as								
Lugada	3.40 0.90	0,30 1.83 9	uantity								
		Total 5.18 cum									
		Curro	0								
3. Bruckworck in boundation		curry	1								
and plinth-	C.90 0.60	0.30 2.13 4.5	5.370.6=5.900								
and plinth- Long Wall- Ist booting 2	5.90 0.60 5.80 0.50	0.30 2.15 L=	5.370.6=5.90m 5.370.5=5.80m 5.370.1-5.70m								
and plinth- Long Wall- Ist booting 2 Rng booting 2		0.30 2.13 L= 0.30 1.74 L= 0.60 2.74 L=	5.3+0.5=5.80m 5.3+0.4=5.70m								
and plinth- Long Wall- Ist booting 2 Rng booting 2	5.80 0.50	0.30 2.13 L= 0.30 1.74 L= 0.60 2.74 L=	5.3+0.5=5.800 5.3+0.4=5.700 4.5-0.60=3.700								
and plinth- Long Wall- Ist booting, 2 and booting, 2 plinthwalls, 2 abord wall- 1st booting, 2 3	5.80 0.50 5.70 0.40 3.70 0.60 3.80 0.50	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	5.5+0.5=5.800 5.3+0.4=5.700 4.5-0.60=3.700								
and plinth- Long Wall- Ist booting, 2 and booting, 2 plinthwalls, 2 abord wall- 1st booting, 2 3	5.80 0.50 5.70 0.40 3.70 0.60	0.30 2.13 L= 0.30 1.74 L= 0.60 2.74 L= 0.30 1.33 L=1	5.3+0.5=5.800 5.3+0.4=5.700 4.5-0.60=3.700								

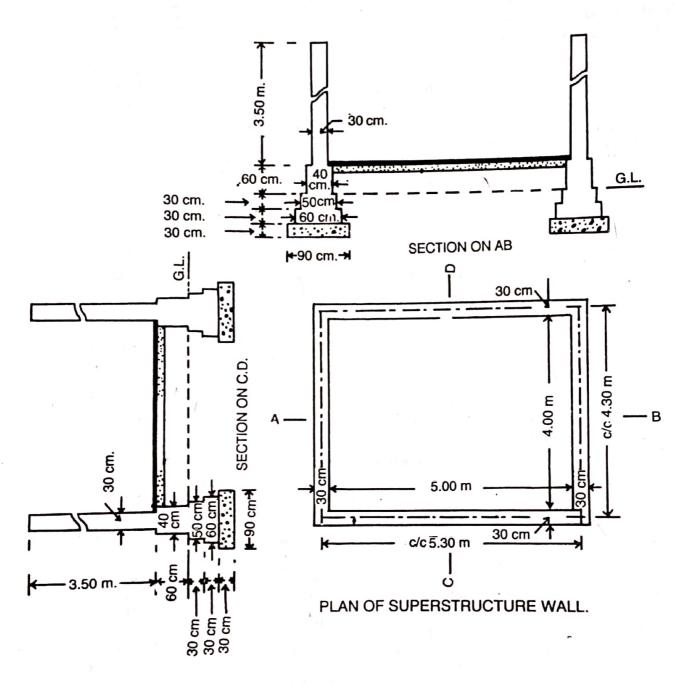
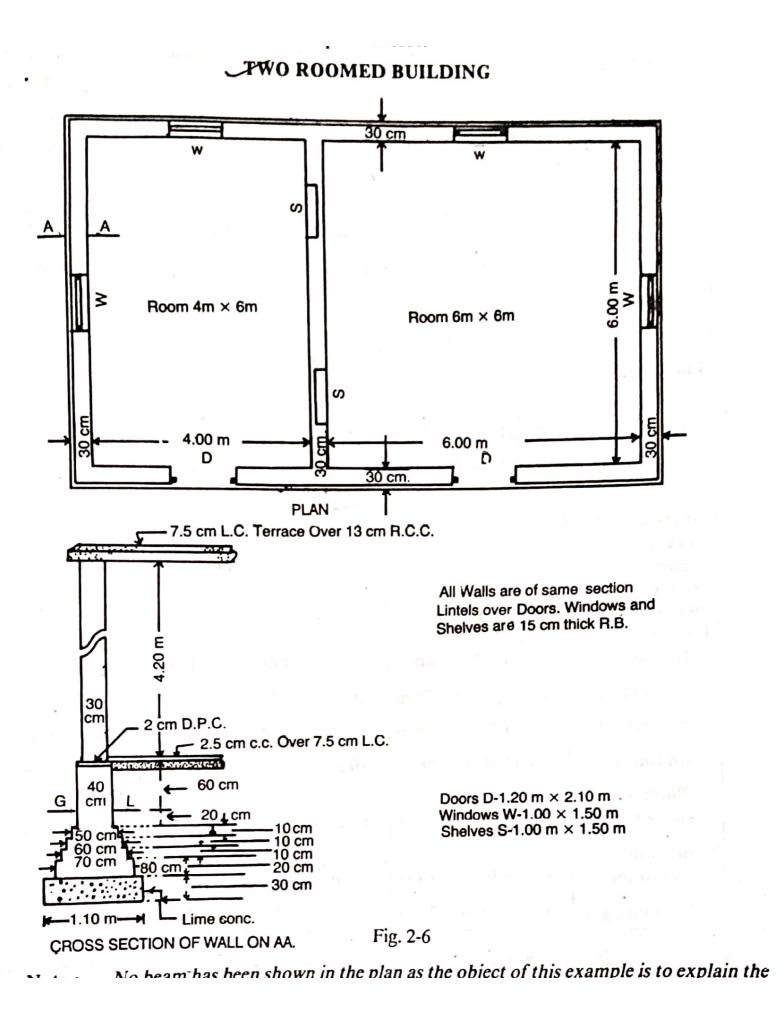


Fig. 2-3



140-1	Bruckwork in	1 No.	Length	Breadth	Height in	Quantity	Explantory thete	-
2	Brickwork in Supenstructure Longwalle short walls	nd	5.60	0.30	3.50M 3.50 m	11.76 8-40	L= 5-3+0.3=5.60m L= 4.3-0.3=4.0m	1 4

Total = 20.16 Wimt

#### EX. 4(a)

Estimate the quantities of the bollowing items of a two moomed building the given plan and section (Figa.G)

(1) Farethwork in excavation in boundation

2) Lime concrete in boundation

(3) Ist class bruckwork in cement mortan 1:6 in boundation and plinth

(1) 25 cm c.c. damp priceb course and (5) Ist class bruck work in time moretan in superistricture

15 Jun	Particularie of item	No.	Ling	Britadin	Depth	Quartity	Explantory note
4.	Furth hiporty in excava	à					elong wall, c/c tensth = 4+6+030+2×030=10.60 shoret wall & inter wall c/e lensth = 6+2+030=6.30r
	Longwalle shoretwalls	CL M	11.70 5.20	1-10	1.00 1.00 Tot	25.74 17-16 al 42.90	L=10.60+1.10=11.70m L=6.30-1.10=5.20m
а.	Lime concrete (9) boundation - Long walk short walk	23	11.70	W	0 30	7.72	Lensthsance ton executiv
3,	1st class brick work in 1:6 cement month	ar			Tot	al- 12.87	
	Longwalls- Ist booting	x 1:	2 11.	10m 0-81 30 0.	to 0-1	0 1.58	L= 10.60+ 0.70 = 11-50m
	3rd bootin 21th boctine plinthwall abay booting		2 111	·00 0.6	· · ·	0 1.11	$L = 10.6 \pm 0.50 = 11.10m$ $L = 10.6 \pm 0.4 = 11.000$
	short walls Ist booting and booting	<b>x</b> 1	3	5.60 0	. 70 0.	20 2.62	L=6.30-0.70=5.60m
	znd booting Ath booting plinth wall a boot boot	e	-	5.80 0	0.40 0	10 1.03	$\frac{1}{54} = \frac{1}{5} \cdot \frac{1}{50} - \frac{1}{50} \cdot \frac{1}{50} = \frac{1}{50} \cdot \frac{1}{50} \cdot \frac{1}{50} = \frac{1}{50} \cdot \frac{1}{50} = \frac{1}{50} \cdot \frac{1}{50} =$
<b>A</b> ,	Damp pridob could a.5cm thick (.c. Long wats short wat		20		0,40 0,40	- 8.	08 Lensths same as bonpli 08 Wall initem 3
	Deduct door sill		a	1-20	0-40 ,10	- 0.0 Total -	5-88 16 14.92 9.10

17em No	Purcticulars of iters	No.	Lenst)	Brucodth	Height 1	quantity	Explantory note.
5	Ist class bruick work in lime moritan in super structure Long walls short walls Deduct Deer openings window openings shelves Lintelover doors Lintelover doors	ab तरत a	10.90 6.00 1.20 1.50 1.50	0.30 0.30 0.30 0.30 0.20 0.20 0.20	9,20 Tota 2,10 1.50 1.50 0.15	0.14	Back ob shelves form thick wait Bearing 15cm
	Lintels over shelver	2	1.30	0.30 0.30 Total.	6.15 6.15 6 deducent	0.23 0.12 1.10 4.41 1 - 45.79	Bearing 15(m Bearing 15(m) D (a.m)

Ex.5(a) Estimate the quantities of the bollowing items of a mesidential building brom the given dreawing (Figg:F). (1) Earthwork in excavation in boundation (3) Lime concrete in boundation) (3) Lime concrete in boundation) (3) First class brick concrete in concert and position in toundation and plinth

- - (3) First class brickeboilty Lie cement sand moretar in toundation and plinth (5) First class brickeboilty Lie comentaries in contraction and plinth (5) First class brickebourse,

  - (5) Firest class bruckwork in line mortan in superistriveture.

And Drawing and left hand side bed noon combined-

(. to c. long walls: 6.00 + 1.00 + 0.30 + 2×0.15 = 10.60 m c. to c. short walls = 5.00 + 2×0.15 = 5.30 m.

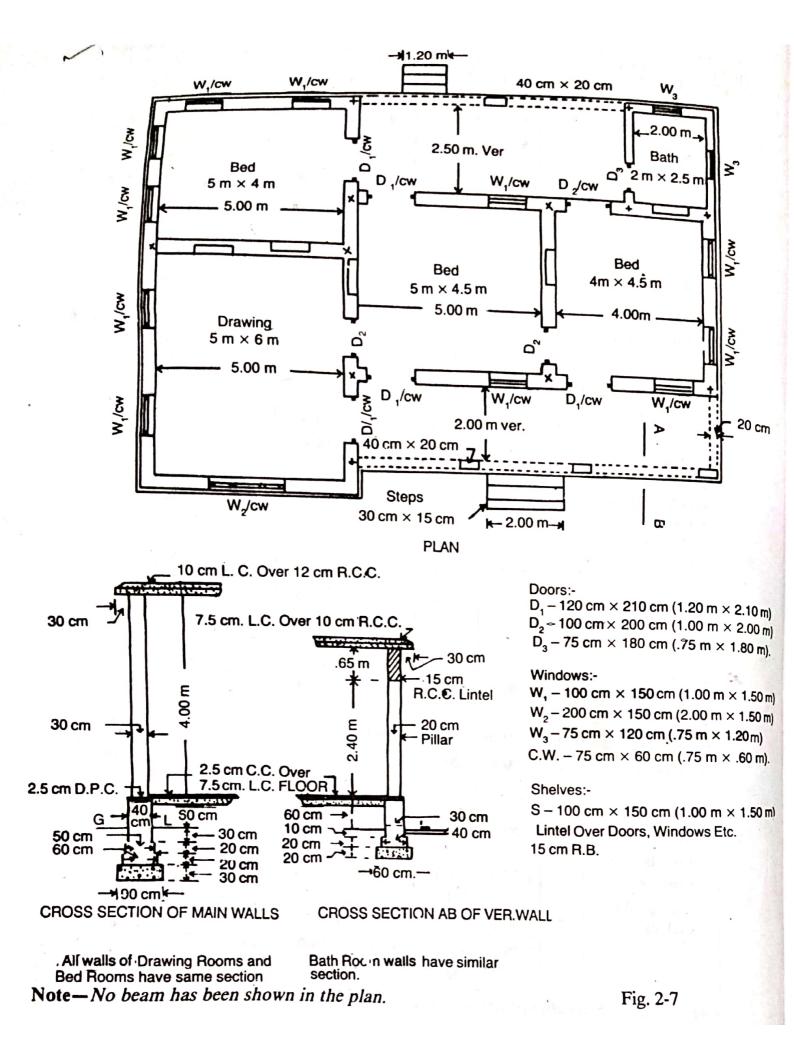
Bedrooms reight side (both combined) (. to c. long walls = 5.00+ 9.00+0.30+ 2×0.15= 9.60m) c. to c. short walls = 9.50+ 2×0.15= 9.80m)

Friont Verindah

Front wall c. to c. length = 5.00 + 9.00 +  $3\times0.3 + \frac{0.30}{2} - \frac{0.20}{2} = 9.65 \text{ m}$ side wall c. to c. length =  $3.00 + \frac{0.30}{2} + \frac{0.20}{2} = 3.25 \text{ m}$ 

Back Venndah including bats moorg

C. to C. long wall Cricar wall including both room) 9-85m same as brint veriv C. to C. length of side wall of bath room= 2.50 f 0.20 = 2.75m



110	Pleasticulars ob Hem	1 -	a support of the second	· · ·	-1 1	1.00 1	a construction of the second on the second
the	budgicalars ob Hem	No.	Lengin	Bricadth	Height	Quantity	Explantany Note
. 1.	Earthword(in excovating in boundation)- Drawing moomondleft bedrooping			<u>in 11</u>	in m		lin d
	Long Walls Short walls Bed mouth rightsedocoth		11.50 4.40	0.90 0.90	1.50 1.50	20.70 11.88	2l L= 10.60+0.90 = 11-50m L= 5.30-0.90 = 4.40m
1	Long walls	2	9.60	0.90	1.00	17.28	L=9.60-0-10+0-90=9.60m lor
	Frient Verindah Frient long wall	2	3.90	0.90	1.00	7-02	1 = 4.80 - 0.90 = 3.90m
	side short wall	1	9.50	8.60	0.50	2.85	1=9.65-0:90+060=9.50m
	Back werten det weluder	1	1-50	0.60	0.50	0.45	L= 2.25 - 0.90 - 0.60 = 1.50 m
	Back vertandahincludig bathrearing Longwall (near wall	1	9.50			0.00	L-9.65 - 0.90 + 0.60 = 9.50m
	in Auding bath) Shord walls (memaining	1_	1.50	0.60	0-50	2-85	
	walls of bath)	a	2.00	0.60	0.50	1.20	L=2.75-0-90-0.60= 2.00M
2.				•	Totals	64.23	cu.m
do	Lime concricterin bound- ation - Dirawing and Lebt brdrictors						the arthoport of
2	longwalls	2	11-50	0.90	0.30	6.21	1 same as bon earthount of
	shortwass Bedmannightside	3	4.40	0.90	0.30	3.56	
	1 ong walk	2	9.60	0.90	0.30	5.18	2 same as born earthwork of
	short walls	2	3.90	0.90	0.30	2.11	excovation.
	friont veriandah						L=9.65-0.50+0.60=9.70m
	Fircont longwall	1	9,70	0.60	0.20		
	side shord wall	1	1.70	0.60	0.20	0.20	L= 2.25 - 0.50 - 0.60 = 1.70 m
	Back veriandah including bath record Long wall including ba	1	9.70	0.60	0.2	0 1.16	$L = 9.65 - \frac{6}{5} + \frac{6}{5} + \frac{6}{5} = 9.70 \text{ m}$
	shord wall (memaining						L= 2.75-0.50-0.60= 2.20m
3	walls of bath) 0	2	8.20	0.60		1: 20.11 c	
	for class bruck work in toundation and plinth 1:6 cement more tare				Joia	1. 2011 0	
	Drawing and left bedroom	2	11.20	0.60	0.20	2-69	1=10.60+0.60 = 11-20m
	1 PTDOMDS/	7	1,10		0.2	0 2-22	L= 11.20 - 2×0.05- 11.10m
	plinthwall above booting	6	11.00		0.90		
	short walls-	82		0.40			
	1st booting	3	4,70	0,60			L= 5.30-0.60 = 4.70m L= 4.707 2×0.05 = 4.80m
	plinthwall above booting	3	4.80				L= 4.80+0.10 = 4.90m
			-1-10				
	Bedrioom right side (but		9.6	0.60	0.2		1 = 9.60 - 0.6 + 0.6 - 9.60 m
	Long wall fish boding	3 0	9.6	0 0.50	0.2	0 1.93	
	shoth noal above bours	ny a			0.9	0 \$.91	L= 9.60 - 0.40 + 0.40 - 9.60 M
	short wall	2	4.2	0 0.60			1-4.20-0.00 = 4.20m L=4.20+2×0.05 + 4.30m
	and booting	2	9.3				the late lite
	plinthwall above boot	19 8	x 19.1				
	,						
-	λ	1		1		1	1



1	ter.	Pereficularis of terr	No	Lenst	Breact	theight in m	Quantet	y Explanto by Note
		shoret wan- ist tecting and botting Plinthwall above tooling	24 2	1.20 1.30	0.50 0.50	0.20	1.0] 0.86 3.17	L=9,20-0.60 = 4.20m L=4.2+ 2×0.05 = 4.30m L=4.30+10 = 4.40m
And the second		Front verindah Front Wall Froting	1		0,40	0.20	0.77	$L = 9.65 - \frac{0.40}{2} + \frac{0.40}{2} - 9.65 m$
		Phinthwall above tooting side shard wall Footing	1	9.60	0.30	0.70	2.02	$L = 965 - \frac{0.40}{2} + \frac{0.30}{2} = 9.60 \text{ m}$ $L = 2.25 - \frac{0.4}{2} - \frac{0.4}{2} = 1.85 \text{ m}$
		plinthwall above trations	1	1.90		0.70	0.15	L = 2.25 - 0.4 - 0.2 = 1.900
		Back verinden in cluding						2
		Longwall Froting	1	9.65	0.40	0.20	0.77	plength same as ton tright
		plinthwall above tooting	31	9.60	0.30	0.70	2.02	Sveitndah longwall
		Criemaining walls of bath) Froting		0.0-	0.100		. 20	0.40 2.40
		plinthwall above tooting	2 2	2.35	0.40	0.20	0.38	L=2.75-0.40-0.40, 2.350 L=275-0.40-0.30, 2.400
	4	2.5cm Damp prest course			-	Total:	44.95 (U.m	~ ~ ~ ~ ~ ~
		Drawing and left bed record.						
		shoref walls	2 3	11-00		_	E CIE	L same as plinthwall L same as plinthwall
		Bed rooms inner side Long walls	2	9.60		-	7.68	L same as plinthwall
		short walls Verendan peillaru Bathreon	2	4.40 0.50	1 1	-	3.52	L same as plinthwall 5cm extra on all sides
		Rear wall side and inter walls	1	2.50	0.30	-	0.75 1	L= 2.20+2×0.15 = 2.50m
			2	2.40	0.30	Total =	28.67	
	-	Door still Dr	6	1.20	0.40		2.88	
		Dorre Still De Door still De	2	1.00	0.40		0.20	
				-		deduction	1 3.91 59.m	
					Not	total-	24.76 sq.m.	
5	5	st clase bruckwork in super striucture in lime			- 1			
	ſ	Drawing + left bedricom		10-90	030	9-0	26.16	L=10,60+0.30 - 10.90m
		Long walls short walls Bedroen right side	01M	5.0		9.0		L= 5.3-0.3=5.0m
		Longwalls	2	9.60 4.50	0,30 0.30	9.0	23.04 10.80	$L = 9.60 - \frac{0.3}{2} + \frac{0.3}{2} = 9.6 m$ L = 4.80 - 0.30 = 4.50 m
		short walls front verendah front wall as solid	12	9.60		3.05	5,86	$1 = 9.65 - \frac{0.3}{2} + \frac{0.2}{2} - 9.60 \text{ m}$
		side wall as solud	1_	2.00	0.20	3.05	1.22	
		and a second line of the second second		]				A NAME OF A DESCRIPTION

· 17th	Particulars item of worky	Ne	lend	hereac	th Heigh	Quantit	2 Explanteny the
1-	Back venandah including						
1	bath - Backlongwall as solid	r	9.60	0.20	3.05	5.86	L same as brient verindah
I	side and inter walls at bath		2.50	0.20	3.05		
1					Total	13.99 (4.m)	
1	Deduct: Dort Opening	-	1.00	0.00			
1	Depenings D, D. opening D	2	1.00	0.30	2.10	4.54	
1	D. opening D2	1	0.75	0.20		0.27	
	window openings						
1	W openinge Wy W openinge Wa	11	1.00	0.30	1-50	9.95	
1	W. opening W2	12	0.75	0.20	1.50	0.90	
1	clenestory window	18	0.75	0.30	0.60	2.43	
and the second	cc.w) openings shelves openings	5	1.00	0.20	1.50	1.50	Back of chelves form thick wall
	Front vertandah openings						L=9.60-3×0.40 = 2.40m
1	in between prilani	1	8-40	0.20	2.40	4.03	L = 9,60 - 3,000 - 201 - 4
	openingside	1	2.00	0.20	2.40	0-96	
1	Back vertandch opening	1	6.20	0.20	2.40	3.26	L= 9.60 - 2-40 - 0.40 = 6.20m
	Over dooils						
	D. OVER DI D. OVER DS	62	1.30	0.30	015		Bearing 15cm
	D. OVER Dy		0.95	0.20	0.15		Bearing 10cm
1	Over windows W. window W,	13	1.30	0.30	0.15		BRATUNGIBCO
	w. window wh			0.30	0.15		Beatingiben
1	O. window Wz OVER C.W.	21	0.95	0.20	0.15		Bearing soin
-	over shelves	-	095	0.30	0.15	0.710	Bearing 15cg
	Verlandch Lintels						
- martine -	Frientside			0.20			L = 9.60 f = 0.15 = 9.75 m
	Back	-	a.15				L= 2.00+ 015 = 215 m
	isuck	1		0.20			L=9-60-2.40 tox0.15 -7.50m
			Toto		total		
					10101		,
			-				
No.							
Sec. Sec.							
-							
-		J		1			

## METHOD-JI

N

Centreline method: In this method known as centre line method sug- total length of centric lines of walls, long and shored, has to be tound out. Find the total length of centure lines of walls, of same type, long and shored having same type of boundations and bootings and then bind the quantities by multiplying the total centric length by the respective breadth and the height.

in boundation, but concrete in boundation, box all toolings and box superstructur This method is quick but requires special attention and considertation at

the junctione, meeting points of parchition on cross walls, etc Fore nectangulari, circulari polygonal chexagonal octagonal en building having no inter or cross walls, this method is quite sample. For building having croces on pandition walls, bon every junction of paretition on cross walls with main walls special consideration shall have to be made to bind the contract quantity. For each junction half breadth of even one booling is to be deducted broom the total centric lengths. -respective

Exerche) Estimate by centre line method the quantities of the following items of a single room building Fgas U Earchwork in excavation in toundation,

(a) Concrete in boundation, (b) Bruckwork in toundation and plinth

(3) Brackwork in superistricture

Ans Total centre length of walls= 5.30+4.30+5.30+4.30 = 19.20 m.

ites	Particulare of item	MO.	in m	Breadh	inn	Quant. ty	Explantory Metes
1.	Earchwark in excavation in boundation	1	19.20	0.90	0-90	15.55 (4.m)	Total centrie length of all walls = 19.20 m
ຊ.	Concrete in boundation	1	19.20	0.90	0.30	5.18 cu.m	r 19
s.	and plinth						
	and pooting	1	19.20 19.20	0.60	0.30 0.30	3.46 2-88	
	plinth wall	1	19.20	0.40	0.60	4.61	
	,				Total_	10.95 ru.m	
4	Braickwonking superetrivation	1	19.20	0.30	8.00	20.16 cu.m	Doon and window openinge, funtels, etc. to be deducted.

Build Estimate by centre line methods the quantities of the bollowing items of a two roomed

buildings Fig 2.6 1) Earth work in excavation in toundation

(2) Lime concrete in boundation

Estet class bruckworch in cement more tain 196 to undation and plinth

(4) 2.5 cm c.c. damp privot course, and

(5) Jef class bruckwork in lime mortain in superistincture

In There are 2 junctions of the inter wall with the moun wall.

Total centre length of wall = 2× (. toc. of long wall + 3× c. toc. of show wall

= 2×10.60.73×8.30 = 40.10m

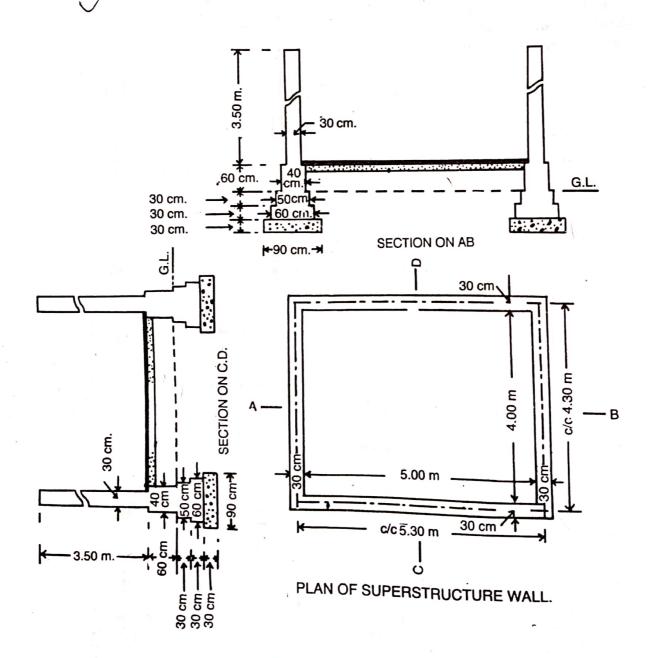
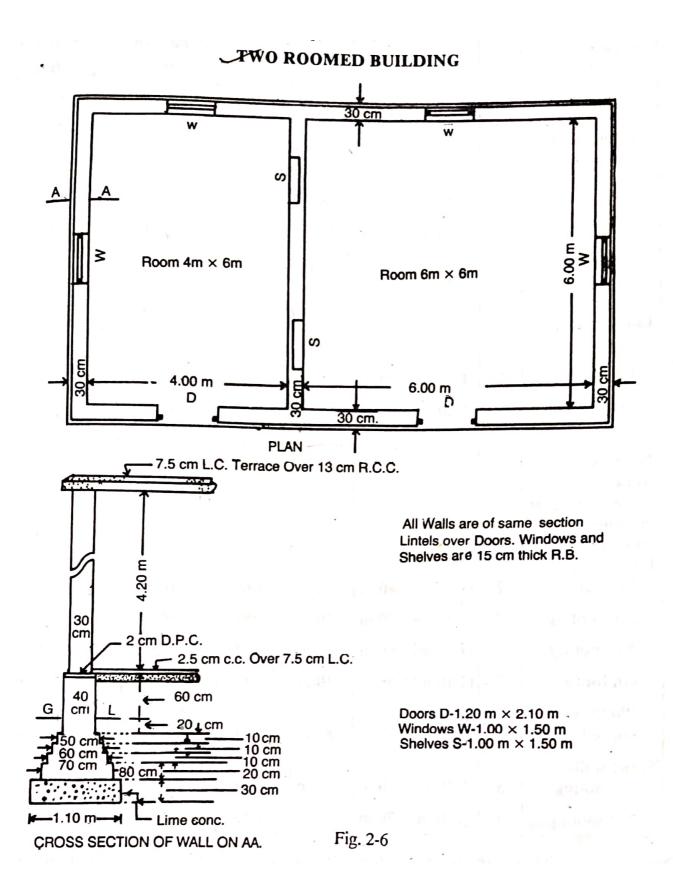
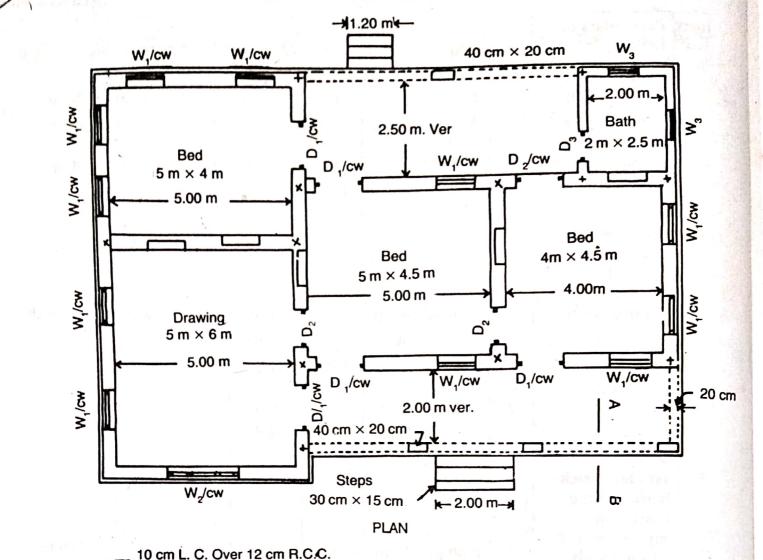


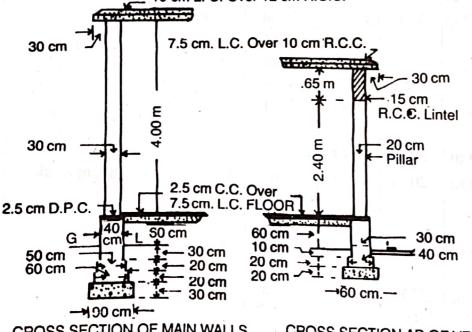
Fig. 2-3



	11	en l'encticulans ob item	Na	Length	Breadth	Height in m	Quantity	Exploritory Notes	1			
			1					Total centre length = 40.1	om			
	л	Eanthwonk in excavation	1	39.00			42.90 (4. m) 12.87	L= 40.10 - 2× 10 = 39.001 L same as above	IJ			
	2	. Lime concrete in boundation	1	39.00	1.10	0.30	cu m	L'anne us alle c				
	ß	Let class brick work in 1:6 cement montan is toundation and plints -	)				200	L-40.10- 2×0:30 = 39.30M				
		fet booting	1	39.30	0.00		ru.m	-110,10-2×0.30 = 39,40m				
1. a. a.		and tooting	1	39.40	0. / 1		27 1	= 40,10 - 2×0.60 = 39.50 M				
		3rd booting	1	-,	000		98 L	= 40.10 - 2×0.50 = 39,60m				
		Ath tooting	1	39.60			2.70 L	= 40.10 - 2×0.40 = 39.70m				
ALC: NOT		plinth Wall above tooting	1	39.70	0 010		-					
and the second	4.		I	29.70	0.40	- 15.		V. 40.10-2×0.40=39.70m				
		Product observation	2	1.20		et 14.	92 cu.r					
	Б.				20 10	20 50	15 L=	40.10-2×0.20 = 39.80 m				
		montari in superstructure	Ĩ	29.80 0	.30 9,	fark 19	1	juction to be made as u	sllou			
		Deduct duon, window, shelve openings and cintels	1-	same as	PRT OK	fack 19 A.4	0	Jucit				
		opena, provoj com p			Net	45.7	5	1 al a reaider	ntial			
-	4		meth	od the	auanti	ties at t	he boll	owing teme of a restored				
1	EX. 5(b) Estimate by centre line method the quantities at the bollowing teme at a regidential building, Fig 2.7 at (1) Earcthwork in excavation in toundation (2) Lime concrete in toundation (3) Lime concrete in toundation (3) First class brickwork in Lie cement sand mortail in toundation and plinth (3) First class brickwork in Lie cement sand mortail in toundation and plinth											
		(3) Lime conclutter work in (3) Friet class bruck work in	1:6 CQ	ement su	OUPPUIC	tructor	и.					
	Ang	To tal centre length ab we	alls of a	1 centre	19 and Tensth	of walls	ot bec					
		= To tal centre length of 1 = GX (- to (. length of 1 + (2) (. to (. length of 1 + (2) (. to (. length of 1	ongwo	11 + 3×	c. foc	. length	hofs	hord wall)				
		+(2)((. +0)(. +0)) + = (2)(10.60 + 3)(5.30) +	(2×9	60+2	xy.80)							
	1	+(2) (1, 60 + 3) (5,30) + = (3) (10 + 28,80 = 65. - 37.10 + 28.80 = 65. Number of junctions for the junctions are with main walls Total centre length of all	90 m.		- marty	od (x'	in th	e plan figart, all the	SP			
		- Still junctions for the	se we	11112	5 march			have been done and be	ath			
		Number of junctions for the junctions are with main walls Total centre length of all	2 26 31	walle	al brion	verta	ndan,	back vertancial arm				
									gan			
		= (c. to c. length ab trion t wall t = (c. to c. length ab trion t wall t long wall including bath) t	c. toc.	to c	length z	of CTIOSS	walls	ob bath 1700m				
		= (long wall including bath) f	ax 1	1.90 + 13	5.15=	27.05	M.					
		= (100g wall including bath) + = (9.65+2.2)+(9.65+2)2.7	7 - 1	1.0	TILLA	1 1. 1.	al from	lanteur Nolo.				
17	RM	Payoticulans of there) No	lers) in	h Bill adh in m	in m	+ 10 Leand	9 10	lantany Notes				
ſ	NU		1				1					
1		Earthwoizkin excavation					-	0.90				
No. 1		in boundation -	63.20	0.90	1.00	56.88	1= 65	$590 - 6x^{0.90} = 63.20 \text{ m}$				
		csix junction			ACA	7.25	L= 27.	05-5×0.90-1×0.60				
		halls of vertandake including 1 bath (five and one junction)	24.50	0.60	10. >0	54.23	uni	05-5×0.90-1×0.60 -24.50m				
THE TOT	1		l	1 .10	101 - 1	[ l'a ]			NIST OF			
19.240												

#### **RESIDENTIAL BUILDING**





Doors:- $D_1 - 120 \text{ cm} \times 210 \text{ cm} (1.20 \text{ m} \times 2.10 \text{ m})$  $D_2 - 100 \text{ cm} \times 200 \text{ cm} (1.00 \text{ m} \times 2.00 \text{ m})$  $D_3 - 75 \text{ cm} \times 180 \text{ cm}$  (.75 m  $\times 1.80 \text{ m}$ ).

Windows:-

 $W_1 - 100 \text{ cm} \times 150 \text{ cm} (1.00 \text{ m} \times 1.50 \text{ m})$  $W_2 - 200 \text{ cm} \times 150 \text{ cm} (2.00 \text{ m} \times 1.50 \text{ m})$  $W_3 - 75 \text{ cm} \times 120 \text{ cm} (.75 \text{ m} \times 1.20 \text{ m})$ C.W.  $-75 \text{ cm} \times 60 \text{ cm} (.75 \text{ m} \times .60 \text{ m}).$ 

Shelves:-

S - 100 cm × 150 cm (1.00 m × 1.50 m) Lintel Over Doors, Windows Etc. 15 cm R.B.

**CROSS SECTION OF MAIN WALLS** 

CROSS SECTION AB OF VER.WALL

Bath Roc in walls have similar All walls of Drawing Rooms and Bed Rooms have same section section. Note-No beam has been shown in the plan.

Fig. 2-7

	nu for the star		- eri	assum	at .
1	- Porticulars 00 ment	No.	L	B	
	W(n)				H Q Ex. Hole
1	( ) o ( of / c · · · ( ) o u · · · · · · · · · · · · · · · · · ·				
1000	intelle of main moon)	1	63.21	0-90	6.30 17:06 Length some at carthunger
	walls of verrandah and bath	1	25.50	0.40	excavation
1				0.40	L= 27.05-5x 50 10060
					Total - 2012 (Minus hall )
-	2 set class bruckwork on bound				Total = 2012 (Minuc halb baradih par cum junction at the same leve)
	3. ation and plints in 1:6 cerners				a sumelevely
	montan - main trome				
and the second	wall of 12t boot ng				
-	2nd tooting	1	69.10	0.60	0.20 7.69 L=6590-GX 0.60 - 64,10m
- Starty	U	1	64.40	0.50	0.20 6.44 1= 85.90 - 6× 50 = 64.40m
-	plinthwall above tooting	I	69.70	0.40	0.90 23.29 1-65.90 CHO
disease of	walls of verrandah and beth-				0.90 23.29 L= 65.90-6x 0.40 = 64.70 mg
1	Froting	1	25.85	0.40	0.20 2.07 L=27.05-5×040-1×040
-	plenth wall above booting	1	25.90	0.30	10 5.44 25.95 m
	Print, P	-1		0.50	e.70 5.44 L= 25.95 mayo-1x0.30 25900 - 1x0.30
and the second				-	Total - 19.93 = 25.90 m 2 2 2
- more	4. 2.5cm Damp price t course				cum
「ない」	Wallso & mach rounds		64.70	0.40	- 25.88
ALC: N	vertandah prilatu	9	0.50	0.30	- 0.6h
in the second	Bath roomy (total of 3 wally	1	7.30	0.30	
and an	BM) Note			0.20	- 1.50 m
1					Total: 28.67
and the	Deduct durin	30	ime as	pan de	Hashig 2 dim
1					Deduction of would
-				Ne	1 Total= 24.76 sq.mt
1 com	5. Ast class bruck-work in super-				
a l'anter a	structure in lime moistain-				0. 20 - 65 10 m
	walls of main Moorer	1_	65.00	0.30	1.100 78.00 L=65.90-6×030=65.10m
					3.05 15,98 L= 27.05-5×32 -1×0.20
	walls ob verinden and		0.0	0.20	5.05 15,98 L=21,05 - 20, 20 - 2
	bath (as solid)		26.20	0. 40	
					Total = 93.98
	Deduct openings and				27.40 Detaile deduction of
	lintele	ame	as ded	ucf.	usual.
1				Ne	4 Total: 66.58
				~	Cuim
		-	1	>	

Anch calculations:

The quantities of masonity work in artch is calculated by multiplying the mean length of artch by briedth of walls and by the theorement of artch. In the case of culvert the quantity of artch masonity work is equal to the length of artch base to bace the bace meanlength of artch x Thickness of artch.

(ase. I segmental Artch with span and angle give of - Artch ob span S subtendening an angle Bod the centre S=span, S=angle at the centure, n=readius Mm= mean readine In = mean length of arech, t= thicknest of arech, b= brieadth ob wall Sing: 5/2  $\frac{1}{2\pi\pi} \frac{\pi}{100} = \frac{1}{360}, \quad \pi_{m} = \pi + \frac{1}{2}$ 5 Im can be bound

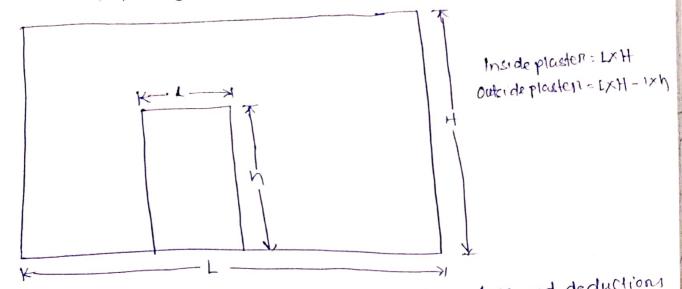
Quanting ob arcch masoning work Q= mean length ib arcch x bileadth of wall x thickness of arcch = Inxbxt

Scanned by CamScanner

1000 · 20 - 20 exil An article of 2.50m spans subtends on angle of so at the centre. The thickness of article is soon and the brieadth of wall is 40 cm. Calculate the quantity of article masoning work. WORK.  $\frac{411}{2} \text{ Radius } \pi = \frac{5}{2} \times \frac{1}{2} = \frac{2.50}{2} \times \frac{1}{0.6428} = 1.945 \text{ M}$ Mean reading Im= 1+ = 1-945+ 0:30 = 2.095m Mean length of artch Im = 27 11 m × 20 = 2×32×2.095×360 = 2.93 m Quantity of artch masonry - Imx bried that wall x thickness of artch = 2.93× 0.40×0.30 = 0.352 cum. Case II Segmental Arich of 60. Ariches over doors and windows are usually segmental subtending an ongle of 60° at the centre 60° arch forms an equilaterial on the span with madri Im- mean length of artch, 11m- mean reading s = span  $\pi = s$  and  $\pi_m = \pi + \frac{1}{2}$ ,  $\frac{1}{2\pi\pi_m} = \frac{60}{360} = \frac{1}{6}$ Im= tox aning= tonny, Im can be bound Quantity Q= Inx breadth of wall X thickness of arcch 60 -Imx bxt 223 Calculate the quentity of brickwork in a Go archover Fis 211 a door of 1.20 m width. The artch is 20 cm thick and the thickness of the wall "30 cm. And  $\pi = 1.20 \text{ m}$ ,  $\pi_{0} = \pi + \frac{1}{2} = (1.20 + \frac{0.20}{2}) = 1.30 \text{ m}$   $\cdot 1 \text{ m} = \frac{1}{2} \times \frac{22}{7} \times 1.30 = 1.36 \text{ m}$ Bread th of wall b= 0.30m, Thickness of errch t= 0.20m :. Q= Imx bxt = 1.36x0.30x0.20: 0.082 cu.m. Arch masonry, Lintels over openings are all deduction works plastering and pointing . plastering usually 12mm (1) thick is calculated in sq.m. For walls the measurement are taken for the whole bare of the wall for both sides as solid, and deductions tori openings arre made in the tollowing mannell -@ No deduction is made ton ends of beams, poets, matters, etc. same time for small opening up to 0.5 sqn (5 sq. bt) no deduction is made, and at the same time no additions are made ton jambs, sobbits and ob stills ob these openings (Eri) For openings exceeding 0.5 sq.ml (5 sq.bt) but not exceeding 3 sq. o (30 sq. bt) deduction is made bor one bace only, and the other bace is allowed bor jambs, sottit and sills which are not taken into account separately. jambs, sottit and sills which are not taken into account separately. (zv) For openinge above 3 sqm (30 sqbt) eleduction is made bor both baces of the opening. and the jarobs, sotbib and sills are taken into account and added. As the outer jambe, etc. are much smaller than the inner ones, the deduction is usually made. For the deduction bon auch opening the same principle as hours masonity work is followed. plastering of ceiling usually ob Lamm (3") thick is computed in sq. m under a separate head as this work is done with richer moretan. For R.C.C. work

alle in the star of the we wally no plastering is allowed but bore baire finish a thin plaster of reich cement more lare may be allowed which should not be taken in the measurements separately. This rich coment mortan plastering in R.C.C. work may also be taken under a

separate item, specially in the certing inside 1000



Pointing: Pointing in walls is calculated in sq.m bor whole sur back and deductions similar to plastering and mode.

while-washing on Colour washing on Distempening:

The quantities are computed in sgm and are usually same as born plastering. The inside is usually while washed on dictempered and thes item will be same as born inside plaster. These outside is coloun-washed and the quantities ob the colour washing will be some as for outside plaster. These stem need not be calculated sepanately but simply whitten as some as bore inside plasters on outside plaster. Number of coats of white washing on colour washing are taken as one job on work and the reater cover for the mamber of coats which should not be a multiplying tactor. The number of coate should be mentioned in this item. Deductions are dealt in the same manner as for plastering. Other types of surface binishing may also be done and may be taken accordingly lainting - lainting on Varniching at doors and windows are computed in sq.m. the dimension should be taken bor outer dimensions of the chowkhat rie outer dimensions of doors and windows. The arrea is measured that. No separat measurement is taken bore the chowkhat, the arrea is same as the arrea of wall opening. Foir in on borrs, gralls etc. the arrea of the clear opening incide the chowkhat is taken. For both faces of pootes and windows, the simple attea as measured above is multiplied by appropriéate numbers al below.

(i) Panelled, brianed and briaced

ledged and batteried on ledged -> 27 times one surbace anea, bor both sides batteried and braced -> 1 times one surface anea, bor both sides battened and braced

(i) fully glazed on gauge

ter) Pourty panelled and party glazed -> 2 times one surbace area, bon both sides on jauge ~ Itmes one surface area, for both sides

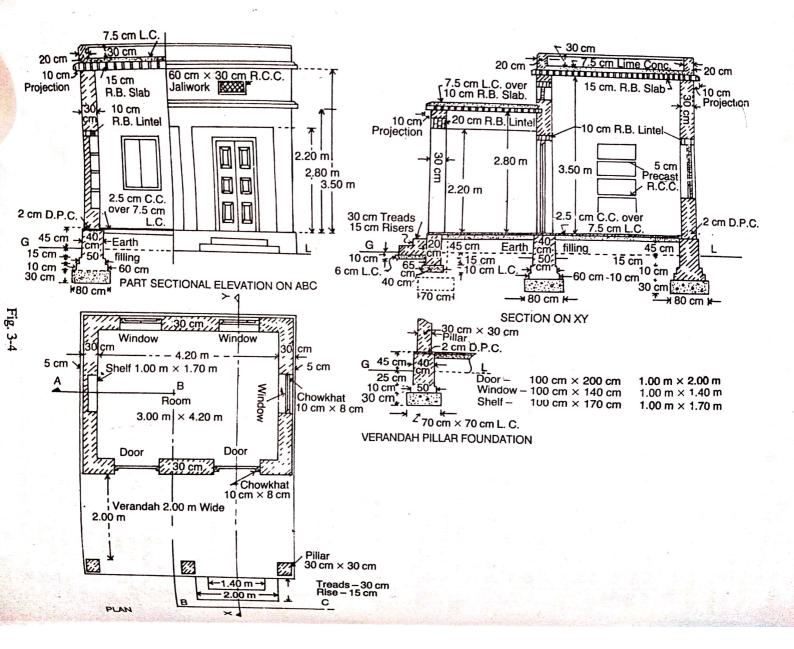
(iv) Flush door -> 3 times one surchace anea, bon both side,

(v) Venetian (i) then bass, grails in windows -> 1 times the arrea of clean opening in

between chowkhat boil over all.

This covers also bore chowkhats on 3 baces. Painting is done in two on three coate

i	e very small, the donnor	400	and the second	- dar 200 - 20		a hore	the numbers of coats under							
1.					1 1/	1001 11	the numbers of coats under hich is in contact with the of coaltant oil solignum							
	The conserver	i alle	agint	ad with	$n + \omega o$	court	i of coaltan on solignum							
	and thes item is comp For bearow, m	uted a	epan. puir	adely. lins, 1	posts, e	et. bt	timber or inton, the arrea							
	jamb of the Wall recustancy pair neg wear to and this item is computed cepanately, and this item is computed cepanately, For bears, notitud, purchas, posts, etc. to timber or inton, the arrea for bears, notitud, purchas, posts, etc. to timber or inton, the arrea for actual exposed surbace is taken for painting. Connugated surbace is taken as blat and a percentage increase is connugated surbace is taken as blat and a percentage increase is													
1	NOURU.													
-FX	amply Prepare a detain	ed est	and	obasi section	ngle no	ONIN	relating hoving a briont veriandah of (Fissia). Generical specification ( ment and local sand mortan							
e	ne as find and plinth - to	rtst cla	ass br	acquor	maile	rt mi	xed with standard water							
O' P'	vest time concrete, active to the tooting material.	shallt	be ob t	inst ela	ss brie	ckword	K in line moretain, Inside and of: lime: sand, reiling chall be							
S	deide walls shall be 12mi	n plas	terred nside.	with . shall be	1°26 2 White	temer zwash	in time: sand, ceiling shall be led three coats and outside white washing.							
tisk C	all be colour washed	one (	windo	over the ochow	NO COU Khats	ats of shall b eation	white washing. white washing. we ob selwood and shutters coatione coat of							
J sh pi	all be Acro parkilled ob a time of the	droda		(1) (1)	part									
Sol	entre to centre rength:			4.50m	e)									
	Longual C. to C. length: short wall C. to C. length verandah briont C. to C. verandah side C. to C.	1 1		20 + 0.	50 - 1-	50M 1.30M								
THE	Particulary and detaile		ength in m	Brieadth inm	Height	Quant	ity Explantony Notes							
1.	Forthworkin excavation													
	in boundation - <u>Room</u> Long walls short walls	2	5.30	0.80	0.65	5.51	L=4B0+0.80=5.30m L=3.30-0.80=2.50m							
	Verrandah — pillarus	23	0.70	0.70	0.65	0.96								
	plinth dwart wall thong (sum total length)	1	3.10	0.40	0.25	0.31	2-4.50-2×0.70=3.10m							
	plints dwarf wall sides	24	1.55	0.40	0.25	0.31	1=2-30-0.80-0.70=1.55m							
р.		1	2.10	0,65 T	otal=	9.83 cu.m.								
	Eauthwork in billingin plinth - Room				0.375	4.46								
	Verrandah		4.10	2.90 2.10	0.375	3.54	L=4.90-0.40=4.50m B=2.35-0.20-0.05=2.100							
	Deduct . Phose ticms , also			- To	tal=	8.00 cc								
	projectional central pill arc priojectionside pillar	1	0.40		0.375	0.03	these deductions may be neglected being small							
	, permit perian	2	0.20		0.375 Total	0.03 =0-06	-							
		d Bet		Net To!	ali	7.94 (4.10)								



sten	Particulant ob item and details	10.	Lensh	Briegeli	th Here	ht Qu	antily	Explantory Hate
	Lime concrete in boundation					)	0	
3.	Room-							
	Long walls	2	5.30	0.80	0.30	2	54	
	short walls Verandah pellam	2	2.50	0,80	0.30		20	
	Doort wall the opt (sum	3	0.70	0.70	0.30	0.	44	
	Dwarf wall briont (sum tofallensth)	1	3.70	0.40	0.10	0.1	5	1 1 50 0 1 0 0 0
	Dwarf wall sides	2	1.85	0.40	0.10			L=4-50-2x0.40=3-70m
	sicp	1	2.10	0.65	0.10	0.1		L=2.30-0.50-0.40 = 1.85m
				10.002	0.06 Tota		08	
Ą	Let class bruck work in toundation and plinth				lisita	- 4.8	56cu	10 A v
	in Lime moistari -					Ì		
	Room_							
	Longwalls							
	Let booting	2	5.10	0.60	0.10	0.6		L=4.50+0.60 = 5.10m
	and booting	2	5.00	0.50	0.10	0.5		
	plintb Wall above booting	2	4.90	0.40	0.60	2.3		L=4.5010.50=5.000
	short walle		$\left\{ \right.$					-24.50+0.40 = 4.90 m
	1st booting	2	2.70	0.60	0.10	0.0-		
	printhwall	2	2.80	0.50	0.10	0.32	-	= 3.30 - 0.60 = 2.70m
	Verrandah.	2	2-90	0.40	0.60	1.39		= 3.30 - 0.50 = 2.80M = 3.30 - 0.40 = 2.90M
								0.30 - 0.40 - 2.4011)
	Pillan booting	3	0.50	0.50	0.10	0.079	5	
	Prillare plinth Dward wall bright	3	0.40	0.40	0.70	0.336	1	
	(sum total length)	1	3.70	0.20	0.60	0.44		
	Dularch Wall sider	2	1-90	1.20	0.60	0.46	6	4.50-21040=3.70m -2-30-0.4=1-90m
	slep:							2-20-0:9-1-000
	1st step and step	L	2.00	0.60	0.19	0.23		
	2010 6100	1	1.40	0.30	0.15	0.06		
5.	2cm D.P.C. of Lig cement				Total:	7.05	5	
	moretan with water priosting							
	materials -	6	1. 90	0.40		3.92		
		2	4.90	0.40	-	2.32		ngth, bricodth same as plinthwa
	Verrandah -							
	1	3		0.40	-	0.48	200	
	Deduct door solls	2	1-00	0.40		0.81		
6.	I-class brickwork insupen-				Tota	- 5.9	259.	nol .
	Striverine in lime moretare							
	KODM-		h 60	0.30	3.50	10.04	x 1.	4.5070.30 - 4.80 m
	long wells short walls	22	4.80	0.30	3-50	6.30		3.30-0.20 = 3.00m
	vali gan -							
	friont above linter	5	0.30	0.30	2.20	0.59		
	sides above lintel	12	9.80	0.30	0.40	0.48	· 1	
	pertaped long walls	2		0.20	0.375			
	partopet short walls	2	3.20	0-20	0.375	0.4	8	
	Deduct:			-	Total	: 19.2	2	
1		2	1.00	0.30	2.00	1.20		
	window openings	3	1.00	0.30	1.70	0.34		
	shelt	1	1.00	2.20		0.51		

のようであって		Particulars of iters and detail	No.	inm	Breactifi	in m	quantiz	Exploritory Nels
	N	Ventilatoria	2	0.60	0.30	0.30	0.11	
	L	Lintel over doord	2	120	0.30	010	0.07(0)	10 cm beatinge
		Lintel over windows untel over shelves	3	1.20	0.30		1	Total 00 (c) s = 0, 24 cum
		intel over vertelator	1	0.80	0.30		0.02(4)	( total of to ) s = 0, s + cut as
No.			-	-		(duction)		un
				1	total		6.07	_
	-	P starred B = as parts in		. 6	10/14		(010)	
	1.	Reinborced Bruck work in 133 cement moritan excluding						
		steel and its bending but						
		including centering and						
		shuffering and binding steel						
		Root of recom Root of vertandah	11				850	- LONDE
		Linlel verandah briont						sembeatury
		rinter veriandoh sider	2				0	out to out
- north		Linter over doone, windows etc		same as		2.20 0.2	(58 19	5cm bearling
			h	nankedco	a) in the	m (6) 0. 1	040	
- Marine					•	tal 9,0		
and the second					1		no).	
- A Rule	8.	7.500 lime concrete in 1000						
		terracing complete with surface binishing -						
		Roop of room	1 1	.40 3	.20 -	14.0	08	
-					40 -	12.	00	
				-		al= 26.	180	
	9.	Salwood work in chowkhet.				cu		2 vent - 2 oym each
		Dooise (including 4cm insertis	2 5	5.08 0.1	10 0.0	8 0.08	1 2.	1 Hor 1. Wim each
			3 4	-80 0.	10 0.0	8 011	5 3	2 val - 1.40 m each 2 Hon 1.00 m each
and the second	10	4 cm thick Peinellagshultery				tal = 0.10	16	
		of Drodan wood				cu-r	1 fr	
10		Doons	· · · · · · · · · · · · · · · · · · ·	.87 19				ocros riebate
17-12		windows	5 0	187 1.2		3.31		
		La Litter including again			Tot	al 6-68	2.	
	1).	Incon bittings including scient						
		and bying toudand and sa	meas	tore ster	n(10)	6.68	29.ml	
	12.	Precast R.C.C. stab shelve						
		complete work including				- 103	2 .	
		steel meintoil cement and 3	1,0	8 0.	20 0.0	cuir	2 4C	on brancing.
		form work						
	3.	R.C.C. jalicon 4 cm thick in ventilations complete						
		work including steel		(1003	0 -	0,365	9.00	
		rein borcement and borm- 2	r lo.	60 0.3				
	u	Mild steel in Reinforcement						1 1 0 1 d - hal 20 5 d -
	(•	bays including bendingin	4.9	UX T X	78.5	2.6980	Der	scillad hiciar the 1 = 42. > " you a
		bassincluding bendingin R.B. wonk(at 0.71. rbiko f)		100				nos in each door and a nor.
		Hold tasts in dures and aus 24	@11.	eg lead	n= 24	: 0.240	Lin	each -window ( Hold bast
				0	Toto	2-2.938	2 et	isity of mildsfeel = 78.5 g/eus less in each door and 4 nor. leach -window ( Hold bast) ) be taken under sepanak to)
( Bar	-	And the activation of the second se		International Provide State	Constant Providence	CONTRACTOR OF CONTRACTOR		

	1 sun	Particulars of this and Detail	No	lengt	Briego	dth He	18th Quan	the Explantary Notes
and the second se	15.	a 5cm c.c. 1:2:4 Diron over and including 7 5cm lime corres	L					
		Reom Verandah	2	9.20	3.00		- 12.60	S1 = out to nuite of the line
			1	9.50	2.15		- 9.68	$< = (1.9 + 2\times0.30 + 2\times0.05)$
		Deduct - central pallans				Total	- 22.28	
		side pillan	2	0.30	015	-	0.045	) B = (RU + 0.50+0.05) - 0.20 215m
1				0.15	0.15	-	0 045	
	16.	2.5cm c c. 1:2:4 floor (conthout) me concrete)_			NET TO		1=0.090	
		Door salls salls ob verrandah opening-	2	1.00	0.30		0.60	
the state		mon in butween pillam	1	3.0.			0.00	
		SIDES	2	3.90	0.20	-	0.78	L=4.80-3×0.30
-	17.	12mm plastering in certing				Tital	0.80	= 3.10 m
		with 1:3 cement and course				J'al.	2.1859	(m)
1		Reom	I	9.20	2 (7)			
		Venandah	1	1.20	3.00	-	12-60	
the second	18.	12mm plastering in Walls with		,	4/10	Total	= 21.00	sa. mt.
		1.1.6 rement 1, me and local sand moretain						
-		Inside -						
		Rosm Long Walls	2					
		short walls	2	7.20	-	3.50	24.90	
		Jambs, sill and soffit of	1	5.40	0.00	3.50		L=1.00/2+1.70/2= 5.40m
		Verlandah- shelt Wall	1	5.90	0.20		1-08	Lational tropic - Strat
		Pellast innert tace	1	9.20	-	2.80	11.76	
		verlandah above pellam	7	0.30	-			3 baces ob central pallance and
		(inner tere) triont						2 taces ob each end pallar
		-DO-sides	12	4.20	-	0.60	2.52	
		soblits of vertandah lindels triand		2.00	-	0.60	2.40	
		sobbits of veriandahlintel	1	3.90	<del>0</del> ,30	-	1.17	L= \$+80-3×0.30 = 3.90m
		vertical taces of inner wall	1	2.00	0.30	-	1.20	
1			2	_	0.30	2.20	1.32	
	1			To	al		76.47	
		reduct door openinge	2	1.00	-	2.00		one surface to each
	0	utside			Net To	ral.	72.47 sq.m	Total of inside plastering
		Boom-					Squin	
		Backwall	1	4-80	-	3 50	16.80	
1		side wall linth including local below	2	3.60	~	3-50	25.00	
The second		SiL. and som offset back	1	4.90	-	0.60	2.94	H=0.4570.05 +0.10 = 0.60m
		-Do-side	2	3.65	-	0.60	4.38	
		Fricht wall eibove veriondah		9.80	-	0.525	2.52	Ht = 3.50-2.975 = 0.525m
		Roof projection bright and	-			1		
		- DO- sides	2	5.00	-	0.25	2.50	$H_{1.} = 0.15 \pm 0.10 = 0.25 m$
		verrandan prillar outer baces	~	0.30	-	2.20	3.30	anetaceating
		Verrandah above pillaru	2				0.00	two baces each stend pillan and
		contentrace mont	i	4.20	_	0.60	59.44	
		-Do-sides	2	2.30	-	0.60	2.76	
-	SIT							
								0 11 0 0

Section Section	le	Particulars abitem and defails ob work	rte.	Lenst in m	Breath	m	Quantit	Explantony Notes
	-	Verrandah plinth						to to be deducted
		Wall tridnt - Do - sidec	12	7.90		0.55	2.70	step to be deducted / Total centre length
		Lananet walls	1					$\int = 2x4.60 + 2x3'40$
		call boun walls)	1	16.00	-	0.875	14.00	2 + 11 = 0.30 + 0.30 + 0.375 = 0.875 m
		Deduct.				1014-	24.37	
		window, openinge	3	1.00	-	1.40	4.20	one bace of each
		ventilatores	Ī	200	******	0.55	1.10	to deductions
			-			Total	5.30	
					Net T	otal =		Total abouts do placedor no
Contraction of the second							59.00	Total ob outside plastering
			ando	uside	t insid	\$ -72.4	1+79.07	= 151.54 59.10
		steps tinished with neat	1			0		
		cement -						
		tel slep Triead	L	2.60	0.30		0.78	
		Rise	1	3.20	-	0.15	0.48	
		and step-	1	1.40	0.30	-	0.42	
1		Rise	Í	2.00	-	0.15	0.30	
		plinth wall	12	0.30	-	0.15	0.21	
Contraction of the second		whete washing 3 coate.	1	0.50	-	0.30 Total:	81.0	
- Section	20.	inside Wall	6.0000	01 100	-10.03		2.37 59	4 v ] .
			Zaute	20 2	temicis)	-	72.47	
and and		eeiling	same	as cech	ng rias	-kTI	21.00	
				inch	(r)(17)	Total		
a statement	~	lector pachine one reat				prag.	93.47- 29.107:	
	٩1.	colocite washing one coats	1.0mg	h aut	side pl	len	79.07	
		washing	suix in	itemai	) Cik pi	ustor (	1 1.0 1	L= outer percimeter minuschep       = (4.90×2+6.00×2) - 2.09
		Deduction porction						- 19.80 vo).
- 1-		byow Gil.	1	19.80	-	0.10	1.98	
and the second second						Total:	77.09	
. wall	22.	painting of doore and window					U	
The second		two coats even one cuats of priming-				200	9.00	1's bon one bace
		DEOTLE		XIn	-		9,45	1/2 ton one tack
and and		windows	3×22	× 1.00	-	Total=		
	23	Coal tarting two coats in				(0)-1	59.09	
		back it chow that's						
		Doons	R	5.08	0.10	- 10	1.02	Lensth same as chookhats
and the second		windows	3	4.80	0.10	-	1.44	in dema
-							2.36.1	
- AL								
- the								Sec. 1

colue of a prime and the construction of work and a fait a

Centreline method single room building with tront verandah.

Estimate the tollowing item

( Farthword mexcavation

(b) Line concrete in toundation

10 Finet class bruck work in toundation and plinth

8) Damp prior + counce

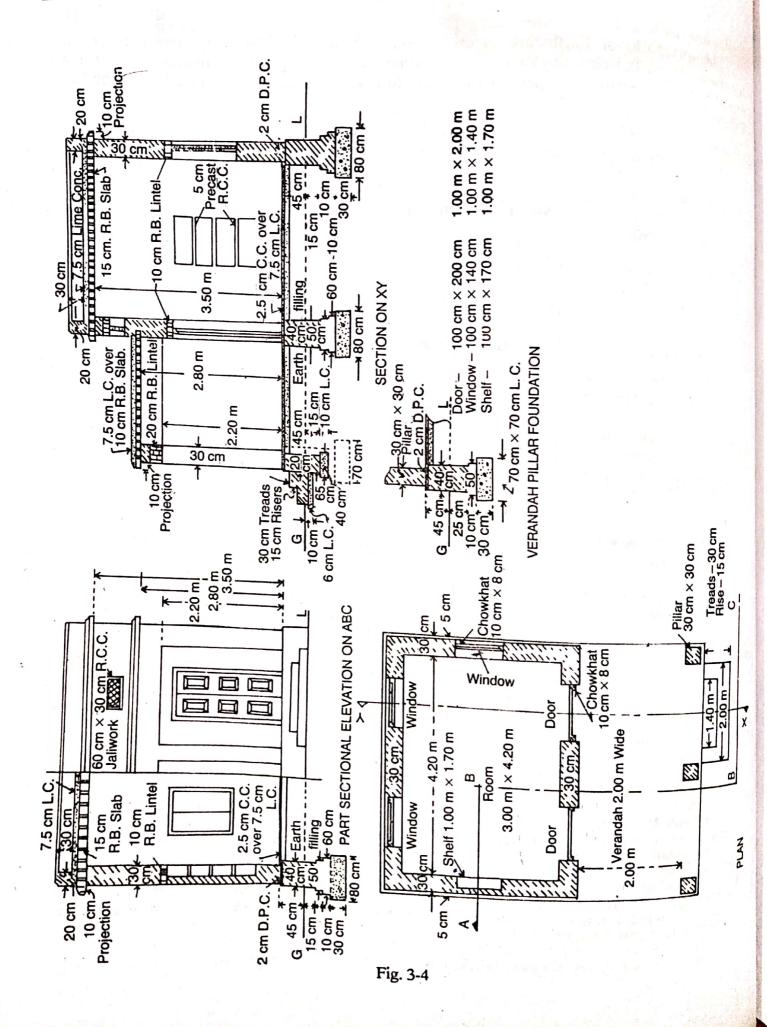
(e) Finit class brickwork in superistriviture

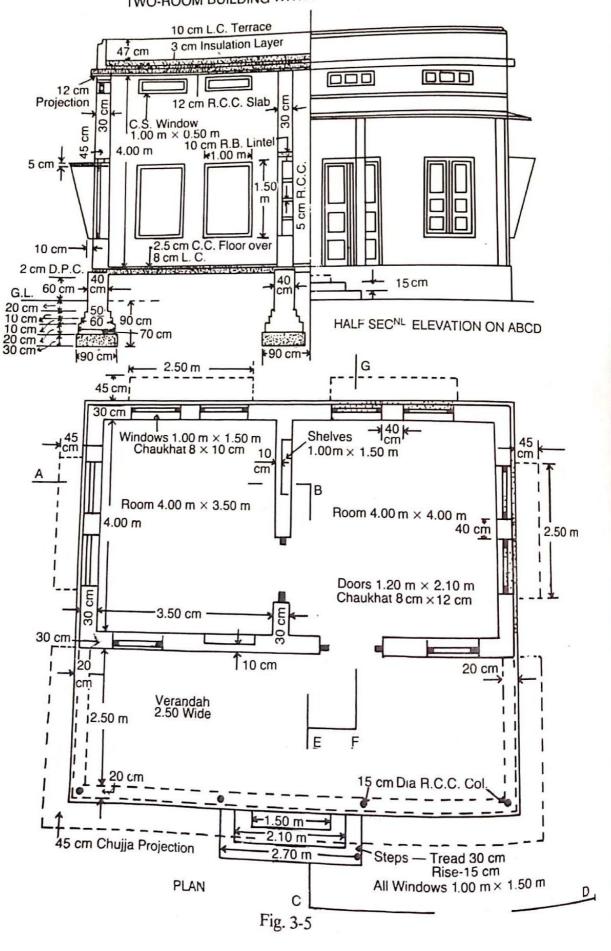
Total length of centric lines obwalls obricom = 4.50×2+3.30×2=15.600

Total length of centre lines of walls of verrandoh - 4.5\$ 2.30x 2 = 9.100

Total length ob centric lines of walls of partopet = 4.60 x2 + 3.40 x2 = 16.00 m

Hem No.	Particularie of them and details	140	Lenst	13 neachth in 187	Height	Quanting	Explantury the
1.	Earthwork in excavation in toundat						
	Pinth of Wart wall step	1 3 1 1	15.60 0.70 6.20 2.10		0.65	8.11 0.96 0.62 0.14	140 junctions S1 = 9.10 - 3pillan - 22 junction Swith main well = 9.10 - 3x0.70 - 5x 20.8 = 6.20
	Lime concrete in toundation				To tal.	9:83 clim	
	Room Verandah ptillaks pletitith dwaitf walli step	1311	15.60 8.70 7.50 2.10	0.80 0.70 0.40 0.65	0.30 0.30 0.10 0.06 Total=	3.74 0.44 0.30 0.08	5 -7500
в.	I-class brack in toundation and plinth-				10143	4.56 euin	
	Room Lef bouting and touting plinth wall	1 1 1	15.60 16,60 15.60	0.60 0.50 0.40	0.10 0.10 0.60	0.93 0.78 3.74	
	Verlandoh pollan Let tooting plinthwall	71 73	0.50		0.10	0.075 0.335	
	Verrandah dwart wali wali step - 1st step and step	1 1 1	7.50 2.00 1.40	0.20 0.60 0.30	0.60	0.90	
4.	Rem D.P. C. REDM		15.00		Tota	1.05	
	Verlandah pillan	1 3	0.40	0.40	_	6.24	
	Deduction alour cills	2	1.00	0.9	Total:	6.75	
5,	1- class brickwork in superstructure				Tuja	= 5.9: 59.10	
	Room Verrandah (al solia)	1	15.60	0.30 0.20	3.50	16.38	1 L 1,10 - 5X 2,0,30 - 8,80m
	Peduct -	1	8.80	0.20	0.375 Total=	1.20	5
	Verrandah opening sides	1	3.90	0.20	2-20	2.57	L=4.20-3×0.30 + 3.900
	verrandon opening triont Verrandah lintel briont	2		0.30	2.20	8.64	
	vertandah tintel sides	2	2.15	0.30	0.20	0.29	
1	Deduction + 6 doon, window etc.		reas ra			3.15	
ATTENTS				1	et Toto	8.90	f ound.





# TWO-ROOM BUILDING WITH FRONT VERANDAH

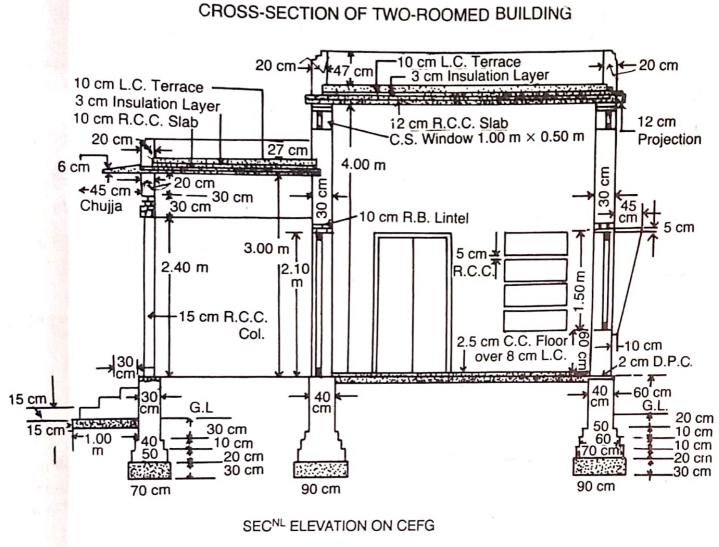


Fig. 3-6

E	prepare a detailed estimate a in drawings plan, elevation, etc.	tat (Fig.	WO ROOM 3.5 and.	red bu 3-6), (1	alding with brond venandah brom the alculate also the plinth Area Rate.								
	Foundation and plints - set clase b.	ick ce	wink in	Lie C	ement montary over time concrute								
	porstaucture - 1st class bill cra	OUR	11) ((1)E	monie	R. MILLINEI Shall De R.B.								
1	Rot - Line concience interest	ord.	· N.C.C.	5100-0	and any insuration regard surgaria crays								
	Flooring - 2.5cm thick (.c. 1:2:4) over 8cm thick lime concrete, over well rammed earth, surface neal cement timished. Sills of cloore and verrandah openings shall have only 2.5cm c.c. blorn.												
	plastening and finiching - Inside and outside wall 12mm thick plastened with 1:1:6												
	time: sand montain, steps 20 mm thick cement plastened 1:3 and real cement finished. R. C. C. wonk in sup-shader and chhairas should be tain and smooth tiniched												
	binished. R. C. C. wonk in sun-shader and chhajjas should be tain and smooth tiniched without any extra payment. Inside white washed 3 coats and outside colour washed 2 coats over 1 coat of white washing.												
-	Doord and windows chowkhad	fran	re)shall b	e of a	sell seasoned salward. shutten shall								
	De que nacionalego	neli	on teak	- wood	d 2 courts over 1 cout of preiming. Back								
	ar chowichar shall be pa	cine	1 with	2 coat	SOP SOLIGNUM								
1	VUSCE 1 dister will your SI	IGH	De pho	Victor	t with 16mm dia mild steel ball. ed in doors and windows - 4 nos. noun								
	water spouts of tocondi	a. (.:	I. pipe	tom 1	ong each shall be provided								
					•								
	Room Long Walls = 3.50	+ 4.0	0 + 0.3	07(	$2\times \frac{0.30}{2}$ = 8.10 m combined lotal length								
	Room shortedans - 4.00	( a	1 2)	- 9.00	at plugth - $(3 \times 0.36)$								
	$= \begin{cases} 3.50^{-1} \end{cases}$	+4-00		36)+(	$(2\times 0.05)$ = 0.30 = 8.20 m								
	Nerrandah sides = 2	-50	+ 0-30+	0.20	= 2-75m.								
Hero			ength B	neadth 1	tright Quantity Explaintony Notes								
16.	of works	10.	m	m	m l								
1.	Earthwork in execution 19												
4-4	boundection)-												
	Room Long Walls	2	10	P.0	0.9 14.58 L=8.10+0.90 = 9.00 ml. 0.9 8.26 L= 4.30 - 0.90 = 5.40 ml								
	chort walls Verrandah bront	3	3.40 8.90	10.9 0.7	0 0 15 61 11 = 8.20 FO. 70 = 8.90 M.								
	Verlandah sidel	212	1.95	0.7	$\begin{array}{c} 0.7 \\ 0.9 \\ 2.46 \\ L= 2.75 - 0.9 \\ -0.7 \\ -1.95 \\ 0.15 \\ 0.14 \\ L= 2.70 \\ +(2 \times 0.10) \\ = 2.90 \\ m\end{array}$								
	step	1	2-90	1.00	Tatal= 31.35								
	- in minth -				20.110								
2.	Earthwork in billing in plinth -	1	3.90	3,40	0.54 7.16 B= 3.50-0.10= 3.40m H= 60+ 2-8= 54cm = 0.54 m								
	Room (i)		3.90	3.90	0.54 8.92 (1=8-20-030=7.90m)								
	Room (ti) Verandah	1	7.90	2.40	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1								
					Total: 25.61								
3.	Lime concrete in boundation												
	Rooms _ walls	2	9.0	0.9	0.3 4.86 may be taken V3 ob excaver								
	short walls	3	9.0 3.4	0.9 0.9	0.3 4.86 May be taken V30bexcavor 0.5 7.75								
				1									

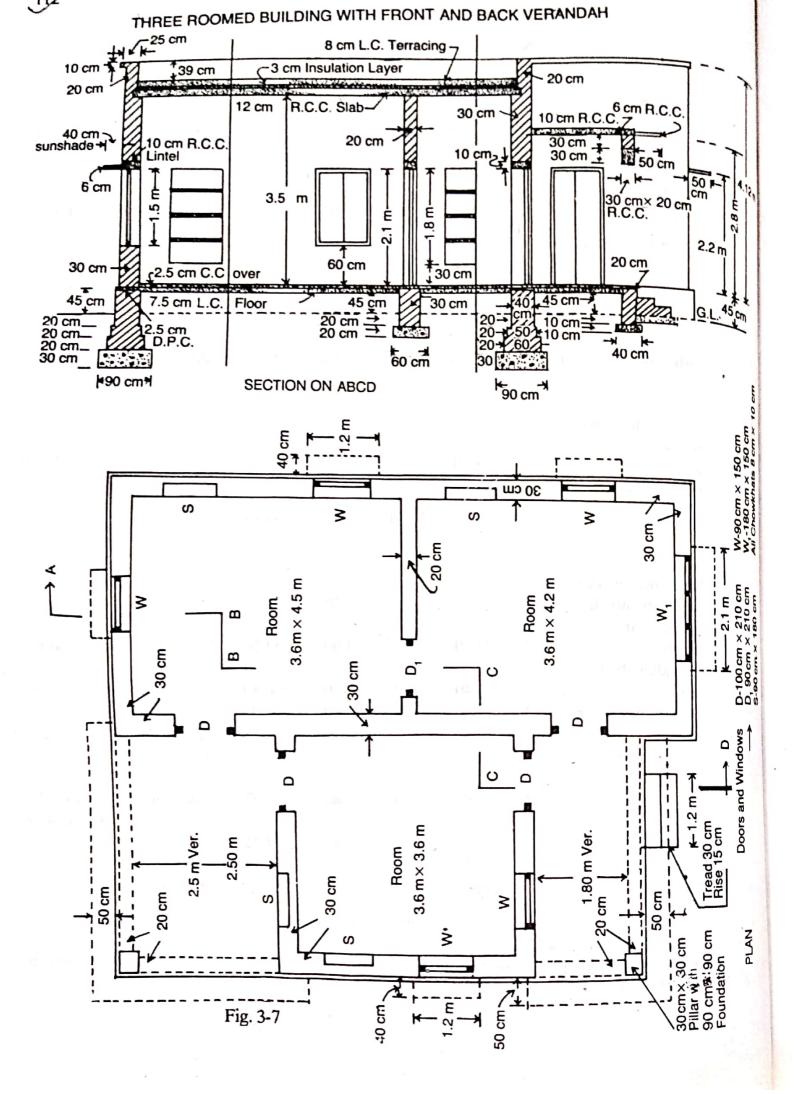
ount ob de Estimate oba 2 room building with briont verandah

f F	I Prepare a detailed estimate a in drawings-plan, elevation, etc. in drawings-plan, elevation, etc. in drawings-plan, elevation, etc. in dation and plinth - det class by Foundation and plinth - det class by Foundation and plinth - det class build comp proof course (D.P.C) - acm the superstructure - det class build superstructure - det class build be three near coment bini 2 coats over 1 coat et class be dem thick panelled of glazed. Doon and window it chowkhat shall be pa Niscellaneous item. Windows s Necessely intern hold tast water spouts of form de Cantre to centre lengths Room Long walls = 3.50 Room shortwalls = 4.00 Verandah frient - Extra = § 3.50 Verandah frient - Extra = § 3.50 Verandah Sides = 4.00 Verandah Sides = 4.00 Verandah Sides = 4.00 Verandah Sides = 4.00	nick nick ick conk over for shed ang shed ang shed ind over to hall over to to to to to to to to to to	wonk in ement m in lime in lime in R.c.c. in 8 cm f Sills of ishadec ishadec ishadec ishadec ishall be ishall be ish	L: 6 a ortan morta slab slab in ck li cloom wall non this and cl be of w wood coals violed on or (: = 4.30 ength (: 30) + (:	ement ma 1: & with r. All lin on the an ii me conce and verice lamm the ck cemen hajjas s hed 3 con ell seaso C.S. win (2 cooth od n da ng each ax 0.30) m at plinth 2×005)	ntari ove 1.00 kg ob tel shan b nsulation nete, over and a hop ack plaster t plaster t plaster t plaster t over 1 num one ond a shall be = 8.10 m - (2x <sup>0.30</sup>	en time concrete composed perboy it contrat De R.B. layen its sandand clays excli mammed earth, ienings shall have unly med with 1:1:6 d 1:3 and neal cement tain and emooth timiched outside colown was hed Davd. shuttens shall them shall be geen thick coat of preiming. Back mild steel ball. windowe gnos. new provided combined total length
16.	Perticulars of iters and defails , of works	to.	ensth B in m	ncadity 14.	n Rua	ntity Expla	antony Note:
1.	Earthworthin exeavationin boundection Room Longwalls short walls Verrandah bront Verrandah sider step	232121	1,00		0.9' 8 0.9 5 0.9 2 0.15 0	. 26 L= 4. . 61 L=8. . 46 L= 2.	10 + 0.90 = 9.00  m1. 30 - 0.90 = 5.40  m1. 30 + 0.90 = 8.90  m1. 30 + 0.92 = 9.7 = 1.95  m1. $3.70 + (2 \times 0.10) = 2.90 \text{ m}1.$
2.	Earthwork in tilling in plinth - Room (i) Room (i) Verrandah	1 1 1	3.90 3.90 7.90	3,40 3,90 2,40	0.01	8.22 /1 10,28 /1 25.61	4.0-0.10 = 3.70 m = 3.50-0.10 = 3.40 m = 60+2.8= 54cm = 0.54 m L=8.20-030 = 7.90 m B= 2.75-0.40 - 0.30 = 2.40 m
3,	Lime concrete in boundation Rooms Long walls short walls	23	9.0 3.4	0.9	0.3 0.3	4.86 m 7.75	nay be taken 1/3 ob excave

International she chan is user.No.No.No.No.No.No.No.No.International control of the state of		Ju- J - tha	1.1	Landh	Preadth	High	Bucht	Contontant - Maria
Image: Non-theory of the set of the se	e11	Terriculary ob elemit work.	Nb.	1 10			a coming of	Exploritory rose
Utrendsh- Frientling1auto6.20altoa the set the set to t	1 tem			m	m	41	1000 A 10100	
Front (Long)22:500:20attra 6445Side, (Short)22:500:20attra 6445Deric openinge101:000:201:504:50Deric openinge101:000:201:506:50Sciele21:000:201:506:506:50Sciele21:000:201:506:506:50Sciele21:000:201:506:506:50Sciele21:000:201:506:606:30Sciele21:000:201:006:207:101Sciele21:000:200:106:207:101Sciele21:000:200:106:20Sciele21:200:300:106:20Sciele21:200:300:311:00Sciele21:200:300:311:00Sciele21:200:300:311:00Sciele21:200:300:311:00Sciele21:000:300:311:00Sciele21:000:300:311:00Sciele21:000:300:311:00Sciele31:1001:1001:1001:100Sciele31:1001:1001:1001:100Sciele31:1001:1001:1001:100Sciele31:1	1 Th			0.110	690	140	67	H= = = + 10+3 = 40cm = 0.4m
$ \begin{array}{c} \text{c.idex} (\text{short}) \\ \text{c.idex} (\text{short}) \\ \text{Dreduct:} \\ \hline \text{Dreduct:} \\ \\ \text{Dreduct:} \\ \\ \text{Dreduct:} \\ \\ \text{Dreduct:} \\ \text{Dreduct:} \\ \\ Dreduc$	1-	Vertandan - Front (long)	1	8.40				
$ \begin{array}{c} \text{Constant} \\ \hline \\ \text{Constant} \\ \hline \\ \text{Derive operating } \\ \text{Constant} \\ \text{Derive operating } \\ \text{Constant} \\ Constant$		,	2	2.50	0.20			11 A
Deduct: The construction opening and building tender tender tender (to the construction) (to the construction)21.20e.30k.161.511010100.201.500.501.500.44R.B. Infel Over Doord uninder tender21.100.300.100.36101.201.200.300.100.36101.200.300.100.36101.200.300.100.36101.200.300.100.36101.200.300.100.36101.200.300.100.36101.200.300.100.3611121.500.300.10121.500.300.100.361314121.500.3014141414151.101.2016161.11171.200.3018161.1119111.2019111.2010111.2011111.201212.000.2013121.20141415141514161517141714181619121912191210121112 <td></td> <td>SI DEL (STON)</td> <td></td> <td>7</td> <td>1. 1.</td> <td>Vota1:</td> <td></td> <td></td>		SI DEL (STON)		7	1. 1.	Vota1:		
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$ \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c}$					0.30		9.50	
$ \begin{array}{c c c c c c c c c c c c c c c c c c c $								
R.B. Initial Over Doest winders C.S. winders shelver21.116 		C.S. window open of						
$\frac{1}{2} \frac{1}{2} \frac{1}$		sherves Dans	2	1.00	U. RU			
$\frac{12}{3}  \frac{12}{3}  \frac{11}{3}  \frac{11}{3} $		R.B. Linter Under Doors	2			1 1	1 /1	10 cm bearing
$\frac{1}{2} \frac{1}{20} $				1.20	0.30			
Image: Shelver21.200.300.100.021Total: 9.361.100.021Total: 9.361.100.021Total: 9.361.111.121.121.121.12Total: 9.361.111.121.121.121.12Total: 9.361.121.121.121.121.12Total: 9.361.121.121.121.121.12Total: 9.371.121.121.121.121.12Total: 9.371.121.221.121.121.12Total: 9.371.121.121.121.121.12Total: 9.371.121.121.121.121.12Total: 9.371.121.12 <th< td=""><td></td><td></td><td>12</td><td>1.20</td><td>0.30</td><td>0.10</td><td>0.432</td><td>Total (G) 5: 0.948 (Line</td></th<>			12	1.20	0.30	0.10	0.432	Total (G) 5: 0.948 (Line
7.R.B. intel toolake excluding eiter and its bending but over doord, windowed shelvedNet Total = $\frac{1}{9.2}$ Net Total = $\frac{1}{9.2}$ 7.R.B. intel toolake excluding eiter and bunding the to shelvedS.Same as both ken windowed or(1) item police or(2) item police to a police		shelver	2	1.20	0,30		0.072	
7.R.B. Intel tooling: excluding chicking centering addishuite and binding steledNet Tatal : 2010 cum7.R.B. Intel tooling: excluding shelved $Net Tatal : 2010$ cum8.R.C.C. work, in veriandah columni sides $s \cdot same as borishem workeda(s) iken pa 6 : 20.9489.R.C.C. work, in veriandah columnisidess \cdot 900 = 0.20 = 0.50 = 0.321sides8.R.C.C. work, in veriandah columnisidess \cdot 900 = 0.20 = 0.50 = 0.321sides9.R.C.C. work in veriandah columnisides and bindingsteel complete them binishedA \times 21 \text{ (ors.)}Y = 2.70 = 0.11 = 30 \text{ cm} inscribed into the productcumtool binshed9.R.C.C. work excluding steelbut including and binding steelthur thished1 = 8.64 + 9.20 = 0.12 = 5.018 = 12 \text{ cm}1 = 8.64 + 9.20 = 0.12 = 5.018 = 12 \text{ cm}1 = 8.64 + 9.20 = 0.12 = 5.018 = 12 \text{ cm}1 = 8.64 = 9.200 = 0.12 = 0.12 = 5.018 = 10 \text{ cm}1 = 8.64 = 9.200 = 0.12 = 0$			[ ]	1	-		(1)	
7.R.B. Intel Would exectuding elicition of the benching but and bunding elicit and bunding elicit believedSome are borniem borner and bunding elicit and bunding elicit believed $3'$ Seven doors, wundoward shelveds.Same are borniem borner or(1)source are more are borniem borner or(1)source are borniem borner are borniem borner or(1) $3'$ Same are borniem borner are borniem brien borners.Same are borniem borner are borniem borner are borniem borner or(1) $3'$ Same are borniem are borniem stellands.Same are borniem borner are borniem are borniem are borniem are borniem are borniem $3'$ Same are borniem are borniem stellands.Same are borniem borner are borniem are borniem are borniem are borniem are borniem are borniem stelland tellands.Same are borniem borner are borniem are borniem are borniem are borniem $4'$ Same are borniem are borniem are borniem tellands.Same are borniem are borniem are borniem are borniem are borniem are borniem $4'$ Same are borniem are borniem tellands.Same are borniem are borniem are borniem are borniem $5'$ Same are borniem are borniem are borniem are borniem are borniems.Same are borniem are borniem are borniem are borniem $5'$ Same are borniem are borniems.Same are borniem are borniem are borniems. $5'$ Same are borniem <br< td=""><td></td><td>,</td><td>1</td><td></td><td>Lil a T</td><td></td><td></td><td></td></br<>		,	1		Lil a T			
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belt doord, windoway shelved bvert Vert pallands from t $bvert Vert pallands from t bvert vert pallands from t $		including centering and shutter 1	1					
Shelves $a(x)$ $b(x)$		and bunding steel -	1			1	-nee	
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Front sides $I$ by $U_{1}$ by $U_{2}$ by $U$			1	ally	I'M I	0. 0 - 1	110	-
8. R.c.(. work in vertandah collumns excluding steel and its bending, but including torm work and binding steel complete them timished 9. R.c.(. work excluding Steel and its bending, but including enterny and shuffking and binding steel, but inshed - Root slabs ritions (hoigh projections (hoigh projections) (hoigh end of d hiverensing) (hoigh end of d			1	8.40	0,20	n 20	1504 0	and to old
8. R.C.(. worth in vertandah collumns excluding steel and its bending, but including town word and binding steel complete them timished 9. R.C.C. worth excluding Steel and its bending, but meluting centering and shuffthing and binding steel, turn timished 9. R.C.C. worth excluding Steel and its bending, but meluting centering and shuffthing and binding steel, turn timished 9. R.C.C. worth excluding steel and its bending, but meluting centering and shuffthing and binding steel, turn timished 9. R.C.C. worth excluding steel and its bending, but meluting centering and shuffthing and binding steel, turn timished 1. 8.64 $4 \cdot seel$ 0.12 5.018 szem projections Root slabs trooms 1. 8.64 $4 \cdot seel$ 0.12 5.018 szem projections 1. 8.64 $4 \cdot seel$ 0.10 $8 \cdot sseel$ 1. 8.64 $4 \cdot seel$ 0.12 5.018 szem projections 1. 8.64 $4 \cdot seel$ 1. 8.64 $4 \cdot seel$ 0.12 5.018 szem projections 1. 8.64 $4 \cdot seel$ 1. 8.64 $6 \cdot seel$ 1. 8.64 $6 \cdot seel$ 1. 9.50 $1 $					1			
8. R.c. (. work, in vertandah columns excluding steel and it bending but including born work and binding steel complete them trinished 9. R.c. (. work excluding steel and its bending, but including conking and shustering and binding steel, but thished 1. $8.64$ $4.24$ $0.12$ $5.018$ s2cm projections Root slabs moons Root slabs rooms Root slabs vertandah (hajja projections vert. broth vert. sides Stun shed and breakers in. Bottom sides Ehelves slabs 10. Midd steel bess including bending in 10. Midd steel bess including bending in 10. Midd steel bess including bending in 10. Midd steel bess including bending in 11. $8.64$ $4.24$ $0.12$ $5.018$ s2cm projections 4.250 $0.10$ $8.352$ 10 cm insential inter bearing, 2.70 $0.15$ $0.06$ $0.251$ Averiage thickness 0.15 $0.05$ $0.055$ $0.045$ $0$	12	1	6					4
<ul> <li>excluding sleel and its bending, but including town work and binding the plinth work and binding the plinth work and binding the plinth is bending, but including steel and this bending, but including steel, and binding steel, bruit timshed.</li> <li>9. R. c. c. work excluding steel and this bending and binding steel, bruit timshed.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections and shuttering and binding steel, bruit timshed.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 4 - 821 0.12 5.018 12cm pnojections interview blave.</li> <li>1. 8.69 5.010 - 8.552 10cm innerview blave.</li> <li>1. 8.69 5.010 - 8.552 10cm innerview blave.</li> <li>2. 70 0.115 0.05 0.251 Avenage thickness vertices interview blave.</li> <li>2. 70 0.115 0.05 0.057 5.5cm insention interview blave.</li> <li>3.01 shed ond breakens interview slabs 1.50 0.05 0.055 5.066 10.5 0.0675 5.066 10.5 0.005 0.055 5.066 10.5 0.005 0.005 5.066 10.5 0.005 0.005 5.066 10.5 0.005 0.005 5.066 10.5 0.005 0.005 5.066 10.5 0.005 5.066 10.5 0.005 5.066 10.5 0.055</li></ul>				1		oray .	cum	
but including torin work and binding steel complete theme timished 9. R.c.c. work excluding steel and its bending, but including century and shuttering and binding steel, taurit inshed 1. $\frac{8.64}{2.50}$ $\frac{4.521}{2.50}$ $\frac{0.12}{2.50}$ $\frac{5.018}{2.502}$ $\frac{120m insertion}{10m insertion}$ $\frac{1}{2.50}$ $\frac{8.64}{2.50}$ $\frac{1}{2.50}$ $\frac{8.64}{2.50}$ $\frac{1}{2.501}$ $\frac{1}{2.502}$ $\frac$	6.			1				
9. R.c.c. work excluding steel and its bending, but including centains, and shuffering and binding steel, built thisting - Root slabs moons Root slabs recomes Root slab veriandation chooja projections L 2:40 2.50 0.12 5.018 12cm projections 10. Sold slabs recomes Root slabs recomes Root slabs recomes Root slabs veriandation 11. 2:41 2.50 0.12 5.018 12cm projections 10. Sold slabs recomes 11. 2:41 2.50 0.12 5.018 12cm projections 10. Sold slabs recomes 11. 2:41 2.50 0.12 5.018 12cm projections 12. 2.50 0.12 5.018 12cm projections 13. 8:64 4.250 0.12 5.018 12cm projections 14. 2.50 0.12 0.06 0.251 Avenage thickness 15. 0.12 5.018 12cm projections 15. 0.12 5.018 12cm projections 10. Sold steel bass including bendings in 10. Midd steel bass including bendings in		hut including town work and binding	1		12		- 10 7	room incontian into the plinth
9. R.c.c. work excluding steel and its bending, but including centains, and shuffering and binding steel, built thisting - Root slabs moons Root slabs recomes Root slab veriandation chooja projections L 2:40 2.50 0.12 5.018 12cm projections 10. Sold slabs recomes Root slabs recomes Root slabs recomes Root slabs veriandation 11. 2:41 2.50 0.12 5.018 12cm projections 10. Sold slabs recomes 11. 2:41 2.50 0.12 5.018 12cm projections 10. Sold slabs recomes 11. 2:41 2.50 0.12 5.018 12cm projections 12. 2.50 0.12 5.018 12cm projections 13. 8:64 4.250 0.12 5.018 12cm projections 14. 2.50 0.12 0.06 0.251 Avenage thickness 15. 0.12 5.018 12cm projections 15. 0.12 5.018 12cm projections 10. Sold steel bass including bendings in 10. Midd steel bass including bendings in		steel complete their finished	AX	(四)日	1 7 1	2-TO 71	0.19 1	wall below blown.
$\frac{11}{16} \frac{1}{600} \frac{1}{100} \frac{1}$				1				
<ul> <li>It's bendling, but including steel, including steel, including and binding steel, including steel, including bendling, steel, including bending, including bending including incl</li></ul>	9.	R.C.C. WORK excluding steel ang						
Image -       Root slabs mooms         Root slabs mooms       1         Root slabs venandabi       1         Ven. triont       1         Ven. sides       1         Sun shed ond breakens in.       1         Bottom       2.70         Sides       2.70         Sides       2.70         Sides       2.70         Sides       2.70         Sides       2.70         Root slabs       1		its bending, but menung steel,	1			1		1
$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	13	stuit timisneg -		0.4	1.84	0.12	5.018	s2cm projections
<ul> <li>Roof slab vertandant</li> <li>chhoijia projections</li> <li>vert. brond</li> <li>vert. sides</li> <li>sim shed ond breakens in.</li> <li>Bottom</li> <li>sides</li> <li>sherves slabs</li> <li>10. Midd steel bass including bendings in</li> </ul>		Root slabs mooms	1		2,80	D.10	2.352	
10. Mild steel bars including bending in		Root slab vertandam	L	0.4.	a.			excluding enage.
Vert. fromt vert. sides Sun shed and breakens in. Windows - Top Bottom sides shelves slabs 10. Midd steel bars including bendings in 10. Midd steel bars including bending in 10. Midd steel bars in steel bars in steel in steel in steel in 10. Midd steel bars in steel in steel in 10. Midd steel bars in steel in steel in 10. Midd steel bars i		chhajja projections		9.30	0.45	0.06	0.251	Avenage thickness
Nert. sided sind shed and breakens in. Windows - Top Bottom sides shelves slabs 10. Modesteel base including bendings in 10. Modesteel base including bending in 10. Modesteel base including bending bending in 10. Modesteel base including bending in 10. Modesteel base including bending in 10. Modesteel base in cluding in 10. Modesteel bas in cluding in 10. Modesteel base in cluding in		ver. front	1		0.45	0.06	0.146	
Windowys - Top Bottom sides shelves slabs 10. Midd steel bass including bendingsin 10. Midd steel bass including bending bendingsin 10. Midd steel bass including bending ben			2					
10. Mild steel base including bendings in							. 225	
Bottom sides shelves slabs 10. Mild steel bass including bendings in 10. Mild steel bass in cluding bending in 10. Mild steel bass in cluding in 10. Mild st		T a	4	2.50			o als	Econ in castion intrusch
sides shelves slabs 10. Mighteel bass including bendings in					0.15	-	1	
10. Mold steel bass including bendings in					, 0.50-	+15 805	0 195	s Som insention any availage
10. Mild steel bass including bendings in		shelves slabs			0.20	1 0.05	0.060	
10. Mild steel bass including bendings in					-	_		
Ingo stee balls a new of sector of						10,00		
		Mild steel bass including bending !	0					
nemborcement @ 1% of R.B. and R.C 2 Wet x 78.5= 8.109 1% of total of item 1. 809		neintoncement @ 1% of R.B. and R.C.	(	1.05	2142	x 78.5.	= 8.10	a 1:1- of total of item 1, 809
winky.		WINKY,		10,-	1.100.			1
		1						
		1						
		1						
	1000							

α,	N®	Preveticulary of item of work	No.	Lensth	Brendth	Height	Quantity -	Explontony Mote
	1ter	01	1401	m	m	m		
The address of the second	11.				-	* 4	1 ** 0 0 **	
		Finishing Roome	1	8.00	4 20	-	33.60	clean noob anea in between
		Venandah	T	8.00	2.50	Total.	20.00	parapet
1						10,141.	=q.ml	
1	12.	Born thick insulation layer of sand and clay					33.60	clean noob anes
and served in sec.		Kooms	1	8.00	4.20	_	20.07	cleart noob aneg
		Vertandah	1	6.		Tota	1- 53.60	t t
Contract of Contract	13.	salwood work in chowichat					Sq.m	
-		Wrought bicomed and biked Drow (3cm insertion into blow)	2	5.46	0.12	0.08	0.105	( 2 vert 2:13 h each
-		windows	ro	5.00	0.10	0.08	3 0.400	SL Hon 1.20m each
		c.s. window	12	3.00	0.08	2.08		Sa yeat 1.50m each.
								S2 vent - 0. 50 m each S2 1ton 1.com each
	1	Acon thick Indian teak wood panelled door and window shuttens including bettings.					1:0.735 1.U.ml	
		Dooles	2	1.07	_	2-03	5 4.35%	Rebate 1-500
		windows	10	0-87	-	1.3:	· · · · · · · · · · · · · · · · · · ·	
						Tota	4-16.274 sq.m	¢
4:	5. 1	tem thick Indian tear wood glazed shutters including bittings (-s. windows	12	0.87	-	0.37		
16	5. 1	rion work (mild steel) in hold rick and windows greatinge					12000	6 nos. per cluor
		Hold basts in abould hold basts in window	2×6 10×9	-	-	-	40 000	4 nos per window
		Hold basts in (.s. window)	12×2		-	-	24 nor	
		and days been 14 mm d. a Al 20			T	oral 6	t 6 hos. D 1 kg/ eac	R
		Window bay 16 mm dia Q1-58 Kg/m -					- 40 10X	
		c.s. windows	12/8	1.50		-	120	Ver. ban at 10cm centres appm- Two honizontal ban.
17.	80	omm thick cement plaster 1:3 19						
	8	lep tiniched cement rendered-	1	4.50	-	0.10	52	Front and sides
		and step pricete 3rd step ilisen	1	3.30		0.1		Frient and sides
		1st step Arread	1	3.91	- (		307	Front and side
		and step triead	2	1.70	(		3052.43	Front and sides.
	P	tinth wall above				0,1	45 0.2:	I sides
		1et step and step	2 0	0.30		0.	20 0.18	sider
		309 step	1	1.50		-	stal: 1.3	
						1.10	50	land .
	1		1		I	1	I	Scanned by CamScanner

and and a	Centre line Mathod - 2 troom building	
	Total length ob centre lines ob all walls ob moore = (2×810) + (3×4.3	o) + 27.10m
	Number of junctions in 2 of similar wais	
	Number objunction is 2 ob dissimilar with a me some level	
	DE Earthworkinexcovation the m m m quarti	Explantory Note
	in toundation 22 84	L: 29.10-2×0:30: 22.20 M
	Rooms . 88,20 0.90 0.90 0.90 0.00 Verrandah 12.20 0.70 0.90 8.06	L = 13.70 - 2× 0:30 = 12.80 M.
	Total - S0.90	<b>2</b>
	2. Line concrete in boundation	
	Rentos 1 2000 000 030 7.61	2 Lensth same at above
	14:00	L length same as above.
281	3) 1-class brickwoizkin boundaring Total: 10.30	S.
	and pupthing is 6 servent montra	
1	RODING -	L-29.10-2×0+ - 28.40m
	15+ 00011119 I 2000 0.10 1.41	L= 29.10~0.60 = 28,50m
	2 rd tooting 1 2660 0.50 0.10 1.43	L= 29.10-0.50=28.60 m L= 29.10-0.40=22.70 m
	plinthwall above booting 1 28.70 0.40 0.80 9.18	
	Verandah 0 151 hooting 1 13,00 0.60 0.20 1.30	L= 15.70-2×0.70=13.00m
	151 000m 1 1	L= 13.70-0.60 > 13.10m
		L= 13,70-0.50= 13.201 L= 13.70-0.40= 13.301
	Minthwall above booting 1 13.30 0.30 0.80 3.19	
No.	Total- 21.12	
	\$ 2 cm Damp proof course -	ingth some as plinth wall
	(2)	
	Tatal + 10.52 59.1	nl
(	of 1= class bluckwolk in super-	L= 29.10-0.30= 28.80 m
	Repros 1 28-80 0.30 4.00	== 13,70 -0.30 = 13,40 m
	Verlandah above linter 1 13.40 0.20	total centreline length
	propet over 1500 1 25.20 0.20	= 2×8.20+2×4.40= 25-2019
	Parapet over verrandah 1 13.40 0.20 0.40 1.07	Total length = 1×8.40+ 2×2.50
	Total: 39.45	- 13.40 m
	Deduct openings, lintel, etc. eus Lunaj - 9-36	Detarly same ar
	Het Total = 30.09 C	uml
	· · · · · · · · · · · · · · · · · · ·	·
	Estimate of a B troomed building wi	th briont & back verrandahi
1	the standard and the standard and and the	iven in Fig s.T. Estimate the
Y	it is the following with on which on the states in	adalian rai al alle tonicitation
	Quantities of the bollowing terms of work of the building. Quantities of the bollowing terms of work of the building. (2) Earthwork in excatation in toundation, (2) Line concrete in boundation lime more tax in toundation and plinth, (4) Domp proof counse, (5) Lot class lime more tax in toundation and plinth, (4) Domp proof counse, (5) Lot class	brickwork in Lie cement
	lime more tar in toundation and priviling parapet (6) R.C.C. WORK in 1000	sade, tencis, suisnage en
	re) et el reintronce ment baus in R.C.C. work at 1.1.	on and 3.6×4.2m rom) combind
1	(7) steel reintoncement bars in R.C.C. work at 1%. (7) steel reintoncement bars in R.C.C. work at 1%. And Centre to centre lengther of two adjoining mooner (3.6 × 4.5 m mon	i i i i i i i i i i i i i i i i i i i
	LANGINIC - GION, STOU WAS SIT	
	square mon - (36×3.6m ronm) 1 ong wall s - 3.90m, short walls - 3.90m	
	Verrandel. Centre to centre of 30 cm wall and 30 cm sq priller	-
Part of		
	Long wall (Friend) - 3.900, short wall (side) - 2.50m. Back Burandah (2.50m ver) -	
	Lorgwall (Back) - 3.9019, shout wall (side) - 2.7015)	



Scanned by CamScanner

		le, Ler	st Rhead	s/Height	Quantity	Explantony Note,
Her Panticulars of item and detai	S	m	19	m	0	- principal inter
He ob WOULK	od					
pexcavation in tou	T KJA					
1. Farthillo in room combined - Adjoining room combined -	2	10.10	0.90	0.90	16.36	2=9.20+0.90=10.10m
Adjorning Longwall shontwall	2	3.0		0.90	4.86	L=3.90-0.90 = 3.000
inter wor wall.	1	3.00	0.60	0.40	0.72	L= 3.90 - 0.90 = 3.00m)
anyotre stopport						_ ,
Long Wall (outer)	12	4.80		0.90	3.88	L=3.90+0.90=4.80m
vorandah prilane -	2	0.90		0.90	1.46	L= 3.90-0.90; 3.00m
Vericindan Awartwall - long walls (front back	12	3.00	0.40	0,20	0.48	L= 3.90-0.90, 3.00 m
chort woul (front side)	1	1,10	0.40	0.20		L = 2.00 - 0.90 = 1.1000
shontwall (backsid)	1	1.80	0.40	0.20		== 2.70-0.90 = 1.80 m
ster	1	1.20	0.70	0.10	003	
				Total-	32.99	
a. Lime concrete in toun dation -					cu.mt	
Adiaining Moon conduced-	~	10,10	0,70	0.30	5.45 L	same as item (1)
Longualis	2	3.00	0.90			same as itemat
shoulwall's wall	21	3.40	0,60	0.20		=3.90-0.50=3.40m
		1100	inch	0.20	1.30 1	e la ser a
Longwan Loundy	1	4.80	0.90	0.30	110	= 3.90+0.90:4.80m = 3.90-0.90:3.00m
Short Walls	2	0.90	0.70	0.30	0.49	
Verrandah pellane Verrandah dwaret wall -		1	· · · ·	1. 3. 1.	8 1.	3. H. Y
LADAWAII (HINTAINI DULY)	2	3.50	0.40	0.10		3.90-0.40=3.500
short wall trant(side)	1	1.60	0.40			2.00-0.40=1.60m
short wall back (side)	.1	2.30 1.20	0.40		0.092 1=	2.70 ~ 0.40 = 2.3001
stap	1	1.20	0.40		11.41	-
3. I- claus brackwolux in time				10101-	cumt	
3. I- claus brackwold try and		1		1		
plinth combined-						
Adjottin thalla -	~	9.80	0.60			9,20+0.60=9,300
Long want 1st tooting	27	9.70		0.20 1.	.94 L=	9.80-0.10-9.700
plinth wall	2	9.60		0-65 4	.99 L=	9-70-0.10 -9.60 0
shord water	2	3.30	0.60	0.20 0.	79 L=5	.90-0.60= 3.30m
and tooting	2	3.40	0.50	0.20 0.	.68 L=	5.30 + 0.10 = 3.40 m
plinthwall	2	3.50				3.40+0.10 = 3.500
Interr 20 ch wall	1	3.50	0.30	0.65 0.	.68 L= 3	3.90-0.40 = 3.500
Squarre room in butweeg						
Vegandah						
Long Wall (outer))- 1et tooting	1		~	0.20 0.	S9 [L=3	90+0.60=4.50m 1-50-0.10=4.400
and toothy			0.50	0.20 0-	10 1 - 4	1.40 - 0.10 = 4.30m
short walls -	1-1	4.30	0,40	- 1		
Let booting	2	3.30		0.20 0.	79 2=3	.90-0.60: 3.30m)
and toothony	2	3.40		0.20 0.	82 1=3	.30+ 0.10 = 3.40 m .40+ 0.10 = 3.50 m
Venandah pillans	2	3.50				
1at booting	2	0.60	0.00		15	
and tooting	2	0.50	0,00		.10	
plints wall O	2	0.40		0,0-		
Veriandah dward walls Long wall bront and back	2	3.50	0.20	0.55 0.	FF   L= 3.	90-0,40:3.50m
short side wall ( freak)	Ĩ	1.60		1.55 0.1	8 1=2.	00-0.40:1.60m
ic conception by						
Mar incutto mental and						a 11 a a

	. her	Particulars item it work	No.	Lenst	Bricade	hittigh	+ Quant	* Explantory Nale,
1	Ider No.	, ,	( )0 /	m,	n) m	n m		" Explantony Nates
1		shortside wall ( back)	1	2.30	0.20	0.55	0.25	L= 2.70-0.40 = 2.30m
-		etep- Let step	1	1.20	0.60	015	0.11	- 410 0.40 2.500
1		and slep	1	1.20	0.30	0.15	0.05	
			-			Total		
-	4.	a 5cm damp priceb counser-				1014	cum	
1	-1.	Adjoining room combined-						
1		Long walls	20	9.60	040	-	7.68	
		short walu	1		0.30	-	2.80	
		Square room _ Longwall (outen)	4					
		short walls	12	1.30	0.40	-	1.72	
		vertandah pollans	2	0.40	0.40	-	0.31	
		Deduct Doord Stills -				Total=		
		Dan	4	1.00	0.40		coul	
		D	i		0.30	-	1.60	
				-	otalop	deducti		
				-	1	19 -	14.50	
	5.	1st class bruckwonkint: G				<u> </u>	\$9.M	
		cement moretari in superistructus						-
		Adjoining roome combine of-						
		long walle shord walle	22		0.30	3-62	20,63	HI. up to top of clab
		Inter 2000 wall	I	3.60		1		Hi up to top ob skb
		Square moom in between	-	8.00	0.20	3.50	2.22	14. up to bottom of slab.
		Veitandah - Long Wall couter)	I	4-20	0.30	3:69	4.51	L= 3.90+0.20 = 9,20 m
		verandah palaul	2	3.60	0.30	3.62	7.82	L= 3.90-0.30 = 3.60m
		ver and and 20cm wall above	2-	0.30	0.30	2.80	0.50	,
		Longwall		0.0			- 112	
		shore wall brint (side)	2		0.20		0.43	
		short wall back (side)	1		0.20	0.30	0.14	
		P and -	1	4.10	0.00	0.50		HO B PARAPEZ = 0.29+0,08+0.03 =0.50M
		tation ing record - eater longual cout to out)	1	9.50	0,20	0.50	0.95	L= 9-20-10.30=9.50m
		short walk	2	4.00	0,20	1		L=3,60+030+0.10= 4.000
and the second		Friond vertandahside	1			1		L=1.80+0.60 = \$.40m
		Back venandah side	1	2.50	0.20			L= 2,5070.20 -0.20= 2.50m.
		Equare noom-outer Wall.	1	4.20	0.20	0.50	0.42	L: 3.60+0.60=4.20m
		wells in between ven-and ridem	2	3.90	0,20	0.50	0.78	$L = 3.60 \pm 0.20 \pm 0.10 = 3.70m$
		10-11				Total:		
		Deduct					64 10	4.
		DUST OPENINGS -	4	1.00	0.20	2.10	a.52	
			47	0.90	0.20	2.10	0.38	
		window epringe			1	1.50		
		W,		0.70	0.30	1.50	0.81	
-LA		sherves			0.20 1		1.30	
		Lintel over door, window	4	-1 10		· ·		
		and shelver.	can	pes to	nitemb			Beamins of post clob out dod unlad and ha
			me	ancal	9)	C	561	Branungob nortslab not deducted may be deducted it specified
			L		Total q,	eductor	7.60	
					Net To	tal = cl	10.26	
-	_		-				1	

	Particulari itemot work	Ne	10 in	11	Meight	quart	Explantany Note
12	Taicite	1	m	m	M		
	R.C.C. WORK 1: 2:4 excluding steel and its Dending, but including eentening and shuttening and binding steel						
	× 101 3101) -	1	9.20	3.90	0.12	4-286	Bearing 15 cm
	Adjoining moome combined	L					Bearing 15cm
	square horm	1					U U
	venandah brionf venandah back	1	4.05	q.15 2.85	0.10	1-154	Beaning 15cm
	Venandah chajja -	-L	9103	9-07	0.10	1-159	
	Frient and back long	2	4.55	0.50	0.06	0.273	
	side (front)	2-2	2.15	0.50	0 0.6	0.065	
	cide (back)		2.85	0.50	0.06	0.085	
	sunshades over windows			0.40	0.06	0.110	
	W	4	1.20	0.40	0.06	0,050	
	Lonteloveri d'opile,	1	410	0 10	0.00		
	windows, shelver -						0
	Door D	4	1.30	0.20	0-10	0.1540	Beaning 1500
	Dour DI	1	1,20	0.20	0110	0.0240	Total 16 (0) 1 : 0,567 cum
	window W	5	1-20	0.30	0.10	0.18000	5)
	window Wi	1	2.10	0.30	0.10	0.063	
	shelmer s	1	1.20	0.30	0.10	oral	
	Verlandah linteli						
	triontang backlong			0.20	0.30	0.492	Braning overwal, 200m
	sideCfront)			0.20			5
	side c back)	1	2.70		0,30		-
				1	otals	cun	୦ ୩
7	steel reen boncement bans including						
	bending at 1%						
			10.065	XIDOC	um = 0	1009	
				@ 78,9	59/04	1	
					UNIXTOU	18.5	
					- 7	, 929	,

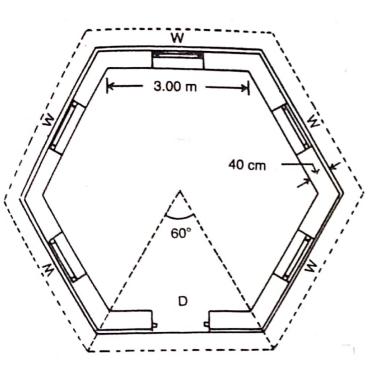
Three room building with trionf and back veriandah

Centraline method

- (1) Total centre line length of all zoom walk-Total centraline lengths of two long walls and two outer shortwalls of the right side noome (combined) and of the three wall. ob the remaining room (square noom) = (2×9,20+2×3 90) + (3×3.90) = 37.90 ml.
- Number of junctions are 2 with soom walls. () Total centre line iensthe of 20cm interwall = 3.90ml. Numbers of junction are & with som wall,
- (i) Total centre line leosth of all soon walls of triord and back veriandah Total centreline. length of the triont veriandiah long wall and side wall and ob the back valandah long wall and side wall = (3.90+2.00) + (3.90+2.70) = 12.50 m.
  - Number of junction ane & (4 cost 30 cm wall and q with 30 cm pillan)

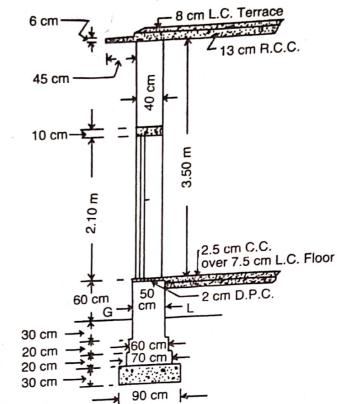
(in Total Lensth of parcapet wall, over outer walk of nightside noons and over outer walle of squary noom = Rightside longwall + bront and back outer walls + (walls by the right side of bront and back venandary + contenwalls of square noom + tront and black acaks et square noom) = (9.50+ 2×4.00+2.40+2.50)+ (4.20+2×2.96) = 22.40+12.00-34.40m

l'irm No.	Peuticulary of item of works.	No.	Length	Breadth m	Aurela in m	Puort. J	Explantony iter
4.	Eanthwork in execution in toundation						A (10 - 17 00 -
1.	All 30cm walls	1	37.00	0,90	0.9		L= 37.90-2/0.90 = 37.00m
	adom inter wall	1	3.00	0-60	0.40	072	L= 5.90- 2×0.90= 2.00m
l.	Nerrandan pillans All 20 cm wall of verlandah	2		0.90		1.46	
	slep	1	8.90	0,40			L=12.50-8X0.90 = 8,90m
	,	1	1-20	0.60	010	0.07	-
					Total.	52.9 cuin	ht
2.	Line concrete in boundation All soch walls			-		0.00	1 and to part of the the
	20cm interced	1	37.00	0.90	0.30	9.99	Length same as above. L: 3.90-2X°. 50- 3.40 m
	venandah pellang	2	0.90	.90	0.30	0.40	
	All soom wall of vertandah	1	10.90	0.40	0.10	0.44	
	etep	1	1.20	0.60	0.10	0.07	
3.	1- class bruckwork in line montax			-	Tota	11.40	
	in toundation and plinth.						
	All 30 cm walls - Let booting	7	37,40	0.60	0.20	4,48	L: 37.90 - 2X 2 37.3000
	and booting	1_	37.40	0.50		3.70	1 L: 37.90 - 2× 0:50- 37.4000
	spen wall inter wall,	1	3.50	030	0.65	0.65	5 L= 8,90- 2×0.40 = 3.500
	Plinth Verlandah prillans	1	0.00		000		1 2
	1 of TOOTUNY	2	0.60	0.60	0.20	0.15	
	and booting plintb wall	2	0.50	0.50	0.20	0.10	, 
	All 20 cm wall verandah walls,	2	10	0.40	0.05		
	ptinth steps-			1.60	0.15	0.11	
	steps	11	1.20	0-60			5
	and	,			Total:		
1.	All Both Walls	1	37.50	0.40	-	15-0	סת
		1	3.50	0.30		0.3	
	votandan princins	2	0.40	0.90		1-16.3	-
	Deduct door selve	2 am	e as			1.8	1
				No	trotal	2	1.
5.	1-class bridework in 1:6 cement nontare in sugerstructure	1	TI	0.30	3.62	40.5	33 L: 37.90-2× 30 -37.60m
	All Join walls	1	37.60			0.5	0 1= 3.90 - 2× 30 = 3,000
	20 cm inferculall Verrandan pillans	12	0.30	0.30	2.20	0.5	So No. ob junction & with seem weeks
			11 90	0.20	0.20	Ø.Ŧ	1 L-12.50-4X0.30,11.90m
4	the sorm wall of victarian above interinctuding over pillans. barraged call walls	144	11-90	0 0.20	0.40	2-7	S Totallensth all wares
1	25 cm walle	1	34.40	0.25			
					Tota		etol.
	Deduct of cons and window openings 2 linter	same	a-		Tat	,	
	0			r	let Tota	cu	ίπ.



Hexagonal Room

Plan SCHEDULES :-D-120 cm  $\times$  210 cm(1.20 m  $\times$  2.10 m) W-110 cm  $\times$  150 cm(1.10 m  $\times$  1.50 m)



CROSS SECTION OF WALL THROUGH DOOR

Fig. 3-11

ESTIMATE OF A HEXAGONAL ROOM

and the			A list magness	and the second second second									
in pr ro	And The plan and part cross-section of a hexagonal room are given in (fig 3.11). Estimate the quantities of - (1) Earthwork in excavation in boundation, 6) Line concrete in boundation. (3) I-close brickwork in toundations and plinth in line mortar, (1) Darop proof course, (3) I-close brickwork in superstructure in line mortar, (6) R. (C. work in) roof including chajja and lintels, (7) Lime concrete in root term acing, (1) 2.5 cm (.C. even 3.5 cm Lice blook and (1) 12 mm cement plastering 1.6 inside and outside walls. And The Lepsth at the reptue line and the atles of the hexagonal maybe calculated as below.												
1	And The Length ob the centre line and the arrea of the hexagonal maybe calculated as beloc. Fig 3-12. Represents-fith ob the hexagon. The sides of a hexagonal toilin equilateral triangly. at the centru.												
(	Length of centric kine of one side In= 300 + 2x 1.20 - 3.00 + 2x 1.752= 3.23 m												
	Theretoik, total length of centre lines = 6x3.23 = 19.38m.												
	outen length of superstructure wa												
	= 3 55	+ 2 × 0	410	3.460			30 600						
	= 3 00 Outer Lensth of plinthizall = 3.007 2/	0.45	1.752 -	+ 3/ -!	15	/							
		tar 160	: 3.5	20	+ 32		·						
e	sufer tensth of chhajja $l_2 = 3.00 + 0$	× 0.8	2		/	/							
		85	= 3.98	ത		1:3.0	m 1						
	$= 3.50 f 2 \times \frac{0}{1}$	732	~10	···· /.	<u>/</u>		210 CM)						
	Floor arrea: 6xarread one inside = 6x (2xbasexaltitude)		'A'	260	1								
		nbo	/	360									
			ie	-			. 19						
	- 23.39 29.19			nole	= 6×	しまれる	,46×3,46× 3×1.732)						
	Root arrea = 6xarreatone	outro	e tru	angle		(	= 31.10 Sq.Ml.						
Idem	1	1	Lensth	Bready	Harsht	Quali	Explantony Noke						
rto.	Pointiculars of itero of works	No.	i) n	m	r,	quarte	Explantony Nora						
					-								
4.	Easth bord in execution in boundation	1	19.38	0.90	1.00	17.44 cumi	E= Total length of centrulines						
			19,38	0.90	0.30	5.23	33/10 01 excavation,						
ą. ,	Lime concretein toundation 1- class brickwonk in toundation	1	1-1,20	0.10		cum	~						
3.	and plints in time more more	,	19.38	0.70	0.20	2.71							
	Let booking	1	19.38	0.60	0.20								
	plintorall	Ĩ	19.38	0.50	0.90 Total								
9	our Dome pow b the usu		H.38	0.50	-	9.69							
	2cm Damp prosber uly Deduct door sill	1	1.20	050	-	0.60							
		-		Net	Total	3,09 39,m	1						
Б.	I-class brickwonk in superistrivetur	1	19.38	0.40	3.50	97.90							
	Deduct -	1	1.20	0.40	2.10	1.01							
	Door openings window openings	5	1-10	0.40	1.50	3.30	<b>n</b>						
	Lonferoven duarce	15	1.30	0.40	0.10	0-26	5 10 cm bearing						
	Lenter over windows	5		el dedu	cha	4.63							

Not Toral - 22.50

山	Particulane of item + b work	No.	Length is	Breads	Hash	Quanty	Explantony Notes
6.	R.c.c. work complete with steel reinboncement - Root slab	ext	X3.41	×3.4	<u>e</u> x1.:	13x20.13 4.045	
	chhaija Lintek	,	46/3 2 ( as al			66 - 0.603	6×meanlengthXbreadthXthrcicnex
Ŧ. e.	8 cm lime concrete in noot termacing 2.4 cm c.c. overland including 7.500	6 X	3×34	아객		.4.960 cum 21.10 Sgm	
q.	12mm cement plastening lignwals	/	x3X3/2	X 1.73	2	23-38 -57-1971	6x arregot one triangte of side
	Insido outrideabore plintb outsideplintb wall	666	3.46		3,50 3-50 0.70	1266	including local below Q.L.
	Deduct Door opening	N	1.20	Tota	9 -	150.44 2.52	0
	Deand window	5	1.10		1.50	2.25 107-	3 one tace.
-						139-67 29:m	
£x.9	Friom the attached plan an	d the	defi	えずる	wall	sect	0) (Fig B-13) estimate the quantities.

(e) Concriete in boundation

(3) Brickwork in boundation and plink in 1:6 eement montain (4) 2 cm Damp proob courses at plinth level (5) Brickwork in superistricture in line montan. (6) 2,5 cm c.c. over 9.5 cm L.C. bloon.

centrie to centrie length of inclined wall AN

$$= \sqrt{(1.95 \pm 0.15)^2} + (1.125 \pm 0.15)^2} = 2.46m(approx.imately)$$

Total centrie line lengths of wals = 4,80+(2×4.15)+(2×2.46)+==20.27m

Hem the	Particulars item of work	No	m)	m	m		Explantony Noki
1.	Eatifnwork in execution in boundation	1	20.27	0.90	0.90	16.42 cu.m.	3 L= Total centre 1 c north = 20.27m
	Concrete in boundation	1	20.27	0.90	0.30	5.47 cum	
	Biliekwonk n boundation) and plints 15 Lib cement montan - 1st booting and botting 37 booting plints wall	11 }	20.27 20.27 20.27 20.27	6.70 0.60 0,50 040	0.20 0.20 0.20	2.80 2.43 2.03 4.86	

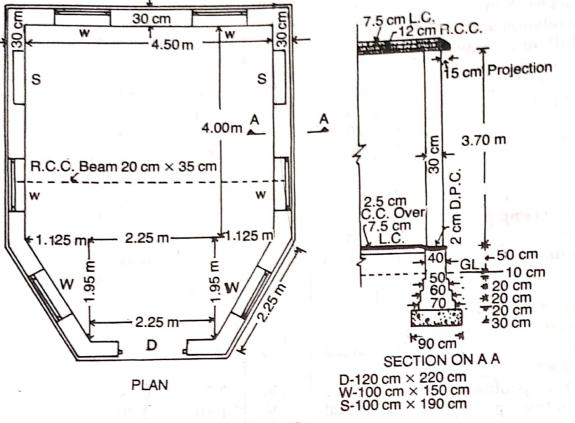


Fig. 3-13

Alfanticulars at iters) of woont	1. 1996 turner shugh Grand Dyplantony Mater					
A. a cm Damp proof counse. A. Deduct doon sill	1 De 21 0.40 - 0.11 1 J. Do n.40 - 0.42 1 J. Do n.40 - 0.42 1.63 1.63 1.63 1.63					
S. Brickwork in superificative in time montan Deduct - Disn opening window opening is hilt Linker over door Intel over windows Linker over shelt	1 20 27 0.70 2.70 2.70 1 1.20 0.30 2.70 0.79 6 1.00 0.20 1.90 0.79 1 1.00 0.20 1.90 0.79 1 1.00 0.20 1.90 0.76 1 1.00 0.20 1.90 0.76 1 1.00 0.20 1.90 0.76 1 1.00 0.20 0.10 0.75 1.00 0.30 0.10 0.75 1.29 0.30 0.10 0.75 1.29 0.30 0.10 0.05 1.29 0.00 0.05 1.29 0.05 1.29 0.05 1.29 0.05 1					
E. 2500 C.C. OVER TSEM Lime concrete troom, Rectangular pontion Food halt Doon sill	4.50 4.00 - 18.00 4.51925 7191 - 6.58 2 1.20 0.35 - 0.42 enty 2.500 0 x Total: 25.00 1.29 M.	114				
eloping noof may be of e) Gialvaniced Connu e) Accessos cement (1) Tales, (1) Tales,	(1) Timber, (1) planks, Thatch, and .					
Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable nation, hip nation and jack notifer may be calculated at below. Areume suitable into the sub is 2.371 (5 cm outer project on beyond and at notifer) Hidding ison ton insential into wall length of nation project on beyond and of nation. His nation from insential into a pair of an outer project on beyond and of nation. His nation from insential into a pair of an outer project on beyond and of nation.						
Hoy notion to be interview of the notion of the length of his notion of the length of his notion of the length of his notion to wait the length of his notion to 4.58 to 0.73 m. Largin of rudge (sum incertion into wait the length of buten projection) = 4.58 to 0.70.05= 4.8000 Jock noticer - Fig 4.5(11))						

 $\frac{1}{3.32} = \frac{3.45}{3.15}$   $L = 339 \times \frac{3.45}{3.15} = 3.5870.$ Lengin of traition is 3.5870.

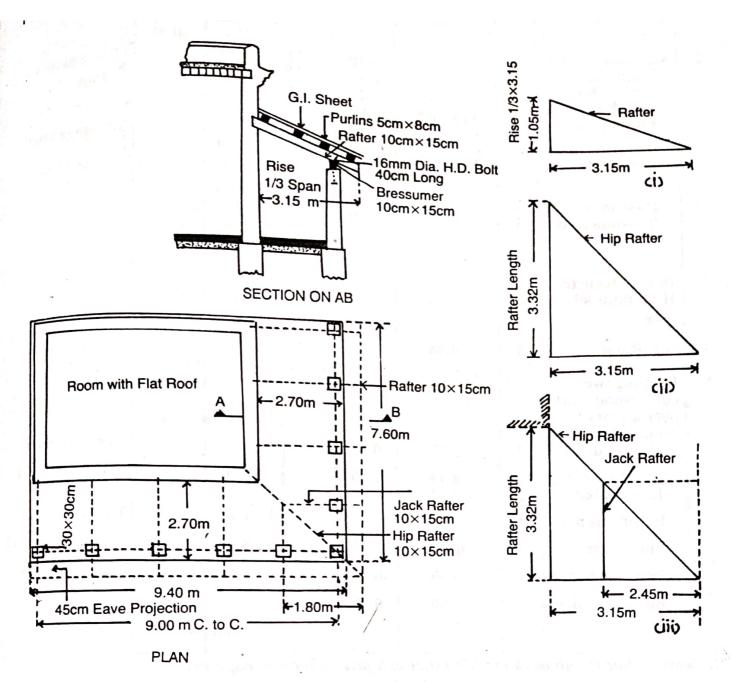


Fig. 4-5

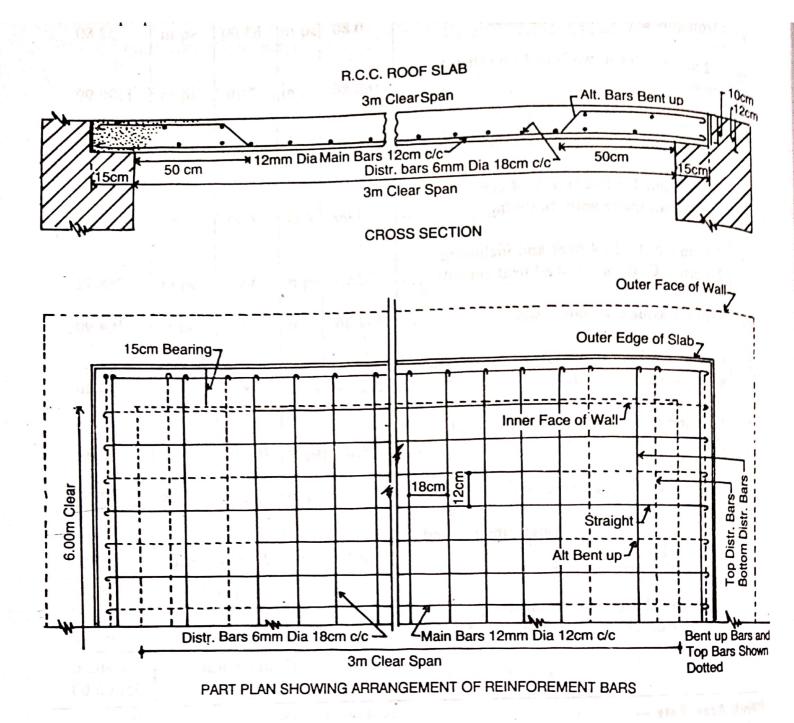


Fig. 5-4

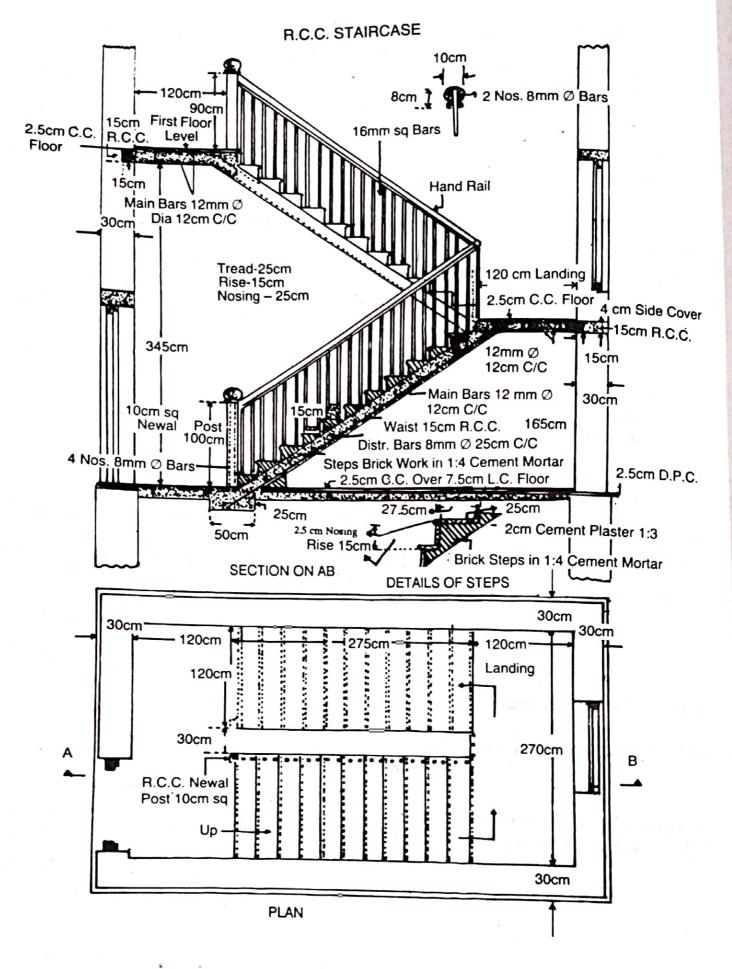
Note-In plan bent up and top bars have been shown in dotted lines.

it? Partit	No.	rently	Breadth	Heich!	Quartity	Explantony Notes
1. G.C.I. sheet moot in verandah - Friont side	<b>1</b> 1	9.8576. 2 8.05799			27.89 21.82	SAUJ. length
2. Salwood work - Main Rafters Hop Kabters Jack natters purlin triont purlin-side Breesumen triont Breesumen broot	7124 411	347 4.73 8.58 9.851-64 9.30 9.30	0.10 0.10 0.10 0.05 0.05 0.10 0.10	Total = 0.15 0.15 0.08 0.08 0.15 0.15 0.15 0.15 0.15	49.71 29.001 0.364 0.071 0.077 0.132 0.132 0.132 0.140 0.113 1.001	Z Forlenster ZArg. Lenster
3. 16mm diameter H.D. Botts 4000 1. G.I. Ridge s. painting two coats wood work	10	4.68	-	-	(U.M) 10 NOX 47.581	
over a Coal of primong- Main Rattery Hip Rabter Jack noblex Purtins brooff purtins side Bressumer briont Bressumer side	オコのタインエ	3.47 4.78 2.53 8.275 6.475 9.20 7.50			8.61 6.73 8.40 = 40.78	16.8×0.5-8,40

And Prepare a detailed estimate of a R.C.C. Rootsbbib3 metoes crean span and 6 metoes long from the given drawing (F85.4). R.C.C. work including centering and shultering and steel reintoncement in details shart be taken sepanately.

Herry	Particulars of iterax of work	No.	length in)	Breadth in m	Height	Quantit	Explantony Notes
1.	Ac.c. work 1:2:3 excluding steel and its bending but including						
2.	centering any shuttering and binding sfeel	1	6.30	3.30	0.12	2.495 cum	No deduction bon stock ban.
ц.	Steel ban including bending (mild steel in R.C. (. work - Main ban 12mm dia ©0,89 Kg/0						side cover 4cm L=3.30-2 side covery f-2 horn:
	straight born sycen $q(1)$ $(Nb. = \frac{6\cdot 20 - 0.08}{0.24} + 1 = at)$ Bent up bous sycen $c/c$ .	27	3.49				= 3.36-0.08+(19×0012) = 3.44m
a.	$\left( \frac{1}{16} = \frac{6.36 - 0.08}{0.27} = 26 \right)$	26	3-52 T	stal 184			
				21 ء	4,40,0	6,89	z.

#### ESTIMATING AND COSTING



	ka Particulary item of work	115	len	se Brand	h Hest	+ Quart	Explantory Note
	Bottom bane central pontion tecnelc (No =	12	63	3			1 = 6:30-0.08+(12×0.006) =6.33 m
	Botton band two sides Top band two sides	273	6.3	2	0.00	raf	
			100	151.92 )	0.22		
				70	ral =		ks guinfal
	Preparte a detailed estimate	FR.			-	A	
No		N.	Lenst	h Brucolt	Heigh in m	f Quantiz	Explantony Noks
1.	R.C.C. Work 1:2:4 excluding sleet and its bending but including contenting and shuttening and binding						
	steel Base of thights in ground blook elab of blights (inclined)	L	1.20	0.50			$L = \sqrt{3.75^{\circ} + 1.65^{\circ}} = 3.21 \text{ m}$
	elab of blights (inclined) Landing middle and trist proore	22	3.21	1-20	0.15	1156 1.094	Beaning 15cm.
2.	Brickwork in steps in 1:4 rement					2.40	**
5	20mm cement plaster 2:6 in steps	axil	1.20	x=10:25	(0.15)	0.495	<i>cumi</i>
	Finished neutino	2×11	1-207 x & x (	(0.25+1 0.25+0.1	13	10,56 0.41	
4.	2.5cm Nosing in sleps in 1:3 cement				otali	10.975 28.80	
	moretan	2×12	1.20	-	_	2.70	
	neat cement bloating in landinge	2	2.70	1.20	~	6.48	sq.m
6.	steel work including bending in meintoncement and mailing						
	6) 12mm Dia baite 0.89129. B R.C. C. WORK- Main bars in Town						
	High and landing	11	5.22				L=4.10+0.90+0.18 dia. = 5.00+C18×010) = 5.229
	Main have in upper blight and						L= 1.30 +3.70+1.05+18×0.12 = 6.25 m
	middle and binet stoor landing		6,25				L=1.08+0.61+9×012=1.80m
	Extra bars first floor middle		.49				L=1.20+0.15-2 COVENSF 2 hours
		~ ľ		K 0. 89 :	- 1	32.56	= 1.49 m)
		'				y	
					~		

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1 den No	Porticularis of item of work	No.	Lengt	Briant	tteizhi in m	Quantit	Explantiony Motes.
	(1) 8mm Dia distributing base Q 0.39 kg in Ric. c. wonk - 1 bus r tight 05 nos. and upper thight 14 nos. Middle landing 9 nos. and upper 1 anding 9 nos.	29 17	1,27 2.77	3			L=1.20-2 covers + 2 hooks = 2.27 L= 2.70-2 covers + 2 hooks = 2.77m.
	16mm 59 bours in roviling @ 2,011g	47	83,92 0,901		Total	2 Kg 250.3	No-(11/2/2)+3 in middle landing = 47 nos
	R.C.C. 1: 2:4 hand read inclusive reintorreement centring and shuttening tinished heat cement to ating worth moulding	1	6. १.२	-		2. 5030 2. 5030 7. 82 1. 10	L: 2×3.01+0,40 = 6.829
	R.C.C. 1:2:4 Newelpoets including steel reinborice ment and bana- work binished Graund Flour First blubir	<u>)</u> 1	1-00	0.0		0 01	(u.m.)
9.	cap of Newel post of c.c.			-		2 nos	2 nos.

## Analysis of Rafa:

The determination of rate per unit of a particular stem of work, bitom the cost of quantities of materials, the cost of labouriers and other miccellaneous petty expenses require for its completion is known as the analysis of rate. A reasonable pretit usually 201 but the contractor is also included in the analysis of rate. A reasonable pretit usually 201 but the contractor is also included in the analysis of rate. Rate of materials are usually taken as the rate delivered at the site work and include the first cost ost of transport, reactions the rate delivered at the site work and include the first cost of transport, reactions the rate delivered at the site work and include the first cost of transport, reactions the rate delivered at the site work and include the first cost of the transport, reactions the rate delivered at the site work and include the first cost of the transport, reactions the rate delivered at the site work and include the first cost of the transport, reactions the rate delivered at the site of the materials are to be called the transport, reactions the rate of the of the site of the transport is also added the transport, reactions ond the form the site of the place and therebore, the rates of the reates of materials and labour vary briom place to place and therebore, the rates of different items of work also vary from place to place and therebore invalued

diblement vienne of work also vary many truct to place about all the operations involved for the purpose of analysis, the details about all the operations involved in cannying out the work should be available, the quantities of maleruals required and their costs should be known and the numbers of different categories of labourers required and the capacity of doing soonk per labourers and their wages per day should be known these can be known only brom expersionce of practical works

Overchead costs. Overchead costs include general office expenses, ments, taxer, supervisus and other costs which are indired expenses and not productive expenses on the job. The micrellaneous expenses on overcheade may be under the bollowing heads.

A. Grenenal overcheods:
E) Fstablishment (Ottire statt)
Ei) Stationary, printing, postages, etc.
(ii) Travelling expenses
(iv) Telephone,
(v) Rent and faxes.
B- Job overchead
(a) supervicion (Salary of Engineers, Overcseens, Supervision-etc)
(b) Handling of material
(c) Repairs; carriage and depreciation of T. and t
(d) Amenities of labour,
(e) Workmen's compensation, insurrance, etc.

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() Interrest on investment		
(1) Losser on advances	it at 6 to 01	and the miscollanow
the (Guintaries and I a another of a	overhead o	xponses and
overhead expenses may come to a bout 5 to 10% ting contractor's proper 15% at the actual cost may be	treasonable	amount but it is
	der the hea	d probil. Forsman
works overthrad cost may be very tittle		
works overthead cost may be rule is usually workled	d out for th	e unit of payment
of the particular ifers of work under too heads-	-	
(h) Labour	on skilled li	about in the form of
Tack - The capacity of doing work by the toek-wor	it on out-tur	inot the labour.
(h) Labour (h) Labour Tack - The capacity of doing work by an artisian quantity of work perioday in known as the task-work quantity of work perioday in known as the task-work	ximate que	antity of work on
The bollowing may be faken as the appli		J
quantity of work per day in known as the task-work quantity of work per day in known as the appro- out-turn on task borr as average artisian per day. Particulars of stern.		
Particulars of stern. 6	Quantity	Penday
1. Bruckwork in time on cement montan in boundation	1.25 cum (4)	scutz) per masos
ad aliath	1.00 (u.m (3)	seutt) peremason
2 Do - in superistructure 3. Brickwork in mud moritan in boundation and plink	Lencus (S	s (uff) per masog 1
3. Bruckwork in much molerent in buch of the anches	1.25 (11.00 (	us cuff) per masos)
	n SS cum (i	it cutil per tomace
5. Do - in jack anches	155 CU.M (	20 cuft per rolusor
	5.00 sgm (	so sq bt) per masos
C LANG FILD DIE CIONE HULSDING IN THE	0.80 cum	(30 Ciult) per masog
8. Coursing netuding diressing montain lime on cement	1.00 (4.1)	35 cufi) per masos
9. Random rubble stone maconry in lime or centent	0,110,011,00	(15 cuft) per masos
nortan masonry in lime on coment mortan	o un clum	(15 cuff) per masos)
A CHORE ATCHINGING	SEACH M	(3m (uti) fer mason)
in I manufacte in toungation of the	con clim 4	200 (utt) Del 1000 )
a lime concrete of the concrete of	C 150 (11.10)	75 (UH) Der muser)
14. cement conclust com		DE LIFET DELLOINUUT
15 R.B. WORK	3.00 (11.10)	(80 sq H) per mason
15. R.C.C. WORK 16. R.C.C. WORK 17. 12mm (±) plastering with cement on lime montan	10.0059.00	(100 sq b1/per mason)
17. 12mm (3) plastering with cement on time montan	0.0210.07	(700 sq br) per white .
		(2000sgft) per white
20. While washing ore colour washing I coats		washen
al. Painting on varian shing doors on windows one coat	25 59.m	(2505964) per painter.
22 coal territing on solignum painting one coat		(350 sabt) per painter
23. fainting lange surbace one coat	35.02.9.10	(3501961) peri painter.
24. Distempering one coat		(350366) peripainter.
25. 2-5cm (1) t.c. blook 26. Flagstone blook laying with home on inment montan		(71559BH) per painter.
excluding L.C.	(0.0029.10)	(wight) per painter.
27 TERRAZO HODA 6MM thick MOSAic WORK OVER 20M	5.00.19.10	1505gb+) per masal
thick rement concrete (1:2:4) as. Bridge-on-edge in blook lime or cement more tar	7-15059.00	(70 sqbt) per mason
excluding L-C.	e tro ca m	(sosqbt) per mason
29. Bruck 1/at floor as in above	0.01 2001	6.5 culs VOR
su. Timber braming salor teak wood	0.0 + curry	(2.5 cuft) per carpenter
B1 DO- country word	0.15 cum	(5 (Ubf) part compension
0,		(midrella)

15

Particulars of item	Quantity	Pendoz
52. Door and window shuttens panelled on glazed	0,15 52m (the	sabt) per conferman
	0.80 sqm & sq	tot) per compentais
24. Sawing hand world		gbt) pen pain of squer
34. Sawing ob sobt wood 35. Sawing ob sobt wood 36. Single Allahabad tiling or Mangelon tiling 36. Single Allahabad tiling		ig H) per pain of sowers
36. Single Allahabad tiling 37. Double Allahabad tiling		gitt) perfile layer
39. Britaking 1 brick bailast 40 mm (12") Jauge		(911) per tile layen (141) per lebourier cr
38. Brieaking of brick ballast asmin (1") jacije		DIVERSIE
40. Breaking of stone ballast 40 mm (15) gauge		(uff) per labourer of prequer.
		breaker
LABOUR (MAZDOOR) REQUIRED	FOR DIFFERENT	1200
Extracts trom the report on productivity p by National Building organisation are given below	projects in building	ng industries issues.
IN FARTEDWORLD DOC 28-30 COM CTOP 2 CUT 1		
(1) Excavation in boundations, trienches, etc. in ora 30m (100) and 12bt of 1.5m (6bt) - 5 Beldars and 4 Mo	dinany soil incl	(1000 cut) (1000 cut)
som (100) aller representation in boundation elup	the object of the	E concelled a ting in 15cm
	mil , rete. Inclucing	AF) per day
(6) layers - 3 Berdans, 2 Mardous and 12 Binst (undo B) Disposal of sumplue earth within a lead of 30m(	20.30 (01) (1000 00	
(100 cuff) periday.		
() Cement concrete work per 2.83 cum (100 cult)-		all a land a second
do 2.83 cu.m (100 cuft) per day	3 Mazdoak, 3/4 Bh	isti ant zi mason cap
(c) R.C.C. Work - (c) Laying neinborried concrete - 3 Beldaris, 3mazde	our, 13 Bhisti and	I maron con do
2.83 cuft (100 cuft) periday. (2) Centering and shuttering bori blat surbaces - 4:		
do a 6 canol a franti per asy		1
(G) Reinborrement work for R. (.C 1 Blackernith or the	itten and I Belda	n can begg cold
place in position 1 quental (2 cut) et steel per day.		•
(P) Stone work let 2.83 cum (150 cuff)		
Random rubble masonity with blue stor	he in toundation) -	3 masons, 3 Beldan, 1
2 Mazdoory and by Bhisti can do 2,53 cum (100 cuft) () Brickwork per 2.35 cum (100 cuft) -	Macopi J.	- The setting walls
	n in superstruct	Where partition wears,
junctions of mosts parapet walls, and string course -	24 masons, 45	Marason, and 3 bring
an do 2.85 cum (100 cutt) per day.		
(F) Wood work -	and 1 helder ca	n more 0.18 current
1) For the brames of doors and windows - 2 (anpentens of club suit)	and I have in (a	(2" 4" - 1 " + 1 " + T ) 4
(eyo cuti) of wood equivalent to fol von brames 7.500 x100		
size penday (a) For papalled alared at the large -15 carporters and	1 4 Beldari can m	ake and fix 4 shutter
(a) For panelled, glazed, etc. shutters -15 carpenters and norm thick of size 2.00m×1.15m (12" thick of size of 6"-9"	x3'-q") penday	Quantity it wood
per shutten - 0.075 cum i e 2,66 cuft		0 /
Gilmon work -		
(1) Fixing another 2 mm 2 2 and (1) and line dillet 1 into a hal	dbasts - I Black	smith (II class)
1 macon, and 7 Beldan can tix 26 holdbast benday.		
1 macon, and I Beldan can tix 36 holdbasts penday. (2) fixing 16mm dia(s/c"dia) M.g. nods-1 Blacksmith (2) and 3 Berdax can tix 16.5 m (54 r. bt) per day.	\$1 class), 2 (anpe	inters (II class)
Light wind 16.5 MIL Squidt per day.		

<ul> <li>(H) Floorning- dem thick (15") thick rement concrete bloorning it 40 sq m(400 sqbt) require - s masons, 4 Beidam, 3 Mazduori and 1 Bhisti peridag born mixing, laying and finiching.</li> <li>(I) Finiching - (I) Finiching - (I) Finiching - (I) Jasterring with any mortan 12mm (2) thick - 3 Masons, 3 Mazdoors and 1 Bhiri (I) Jasterring with any mortan 12mm (2) thick - 3 Masons, 3 Mazdoors and 1 Bhiri (I) Houster 40 sq.m(400.91t) periday. (I) Mike washing on colour washing (B coate) - I white washer and 1 Mazdoon con do Go sqin (600 sq.bt) periday. (E) Painting two coate such as chocolate, ned, grey etc. on wood on steel - 3 painter and 2 Mazdoory can paint 10 sqm (100 sq.bt) periday.</li> </ul>				
L cum portland cement (oridinary cement) = 1, 44 groms i.e. L cum of portland cement As per 15: 456 one litre (1 cu decimeter) = b portland cement = 1.44 kg 1 cum ob portland cement = 30 bage bor practiced purpose. L bag cement ob 50 kg = ±0 cum = 0.034 cum. At Rs. 215.00 per bag the cost of L cum of cement comes to R1.6325.00 1 quantal (100 kg) white on stone time				
1. Lime concrete in Foundation with 90 Take - 10 cum. (a) With white lime and surckhil: 2:2	M gaege B noportion	-16:32°102 in 1:2°C man		
Panti culcine				
Materials-	intry on Hos.	Rote Cost Rs. P. Rs. P.		
Brickballast I class 40mm gauge White lime staked sunkhi	LO (U.M. 1.6 (U.M. 3.2 (U.M.	400.00 cum 4000.00 700.00 cum 120.00 350.00 cum 1120.00		
Laboutt-				
Mistrie (Headmason) Mason Mazdoon (Beldan) Boyon women coolie Bhisti (water-man) Sundries T. and P. etc. (misc., Petty thing)	2 no. 1 no. 12 nos. 12 nos. 2 nos. Lumpsum	Total. \$240.00 160.00 per day \$0.00 150.00 per day 150.00 80.00 per day 960.00 70.00 per day 140.00 45.00 L.S. 45.00 Total 2215.00		
	Total	of materials labour = 8455.00		
Rate por un m Adol 101.	aten chan ntractor pric	gel 127.00 bet 245.00		
Approximate calculation of	rteriale tr	to 100 and tor 10 cum		
sunkhi = 16.6×2 = 32.2 cum, Bri In practice these are taken as 16	ballast = 1 uno	Grand Total = 9427.50 for 10 cum: tr 100 cum. L.c. 1: 2:6 lime = 150 $1:2:6 lime = 1501:2:6 lime = 1501:2:6 lime = 16E1:2:6 lime = 150$		
(b) with Karan Lime (35% montan) - un		are - 10 (11-0)		
Particulare				
	antity on	RI P.		
Matercials -		RJ. P.		
Brickballast I class tomm Ja Kankan Lime Labourt	2 10 Cur 3.5 CU	$\frac{400.00(0.0)}{100000} + \frac{4000.00}{14000.00} = \frac{100000}{100000}$		
some as above (dem 1-a)		2215.00		
		Total ob materials & labour = 7615.00		

Charlen chause s	114.00
Add 121. water changes Add 101. confinactoris probit	761.50
And 101.	Emand total: 8490.50
Rote per cum	m- RL. 8490.50/10 = 849.00 for 10 CU10
1.4 With Kankary lime and surkhi of 2	L: 1 proposition - 10 curp
Brickballast 40 mm gauge 10 cum, Ko	ankar the 2.2 can and succh 2.2 can be the
same as above	t may also be used where stone ballast is cheap,
In place of bluck ballest, store runar	
which is usually in hill atteas.	the second second
3 Line concrete in Foundatiogon Floor	Take 10 mm gauge ctone ballost, white lime and
sand (Proportional) 2 1) and 3 tans. I	Take - Id taim
Matercials - stone ballast 40mm gauge (10ca	al) 8.8 cum 900.00 cun 7920.00
Sandon bajni (local)	9.4 cum 400.00 cum 1760.00
white lome slaked	2.2 (um) 700.00 (um) 1540.00
Labourr -	Total 11220,00 ::
same as ton above (item 1-0)	12435.0D
manlet .	Voiten changes
H-TAISI I	contractore problet (303.00
Rede jen 14m - Rs. 14979.	(1110-11
to rection to the det calculation of	b materials for 100 curs. L. C. 1:214 = Lime = 152
and = 22X2= 44 cull ste	The aggine gare = 22xy = 88 cum
hor lov, 88 49 22 as slove 41	1 handle. Sand Lund
3 Line concrete in Terraced Roub with a	25mm gauge Brier ballast unity - I cum. Take - LOCU.M.
(a) with white lome and surrichi- 1:2 Cprie	25mm gauge Brick ballast unity - I cum. Taxe-LOCU.M. = openition 18:36; LED I.E. 1:2:53 approximately
Matercials-	
Brick ballost I clark a 5mm gauge	10 cum 450.00 cum 450.00
white lime slaked	1.8 euro 760.00 cu.m 1260.00
Sutchie Name (Com)	3.6 eum 350.60 CUM 1260.00
Molasses (Gur) Bail bruit (7 rg) in solution	35 0015 250
Labour -	
MistricHzadmason	+ 00
Malon	
Mazdoon (Leldcur)	200. 150.00 per day 300.00 Lonos 80.00 per day 800.00
Bay on women coolie	25 nor. 70.00 per dag 1750.00
Bhiefi (water-mar)	3 nos. 70,00 pen day 210,00
Sundruce T. and Vietu	Lumisum 45.00 L.c. 45.00
· ·	Total = 3185.00
	Total of materials and labour 10420.00
Adg 151 water changes	126+30
Add 107. Contractor's probet	(1043.00
	Ginand Total 1618.30
And PIT ON THE COM ALL AND ALL	Re.11618.80/10= RI.1162.00 for LOCUM
- cumbon to con thickness over +	= 1059m - Rate pen sq.m 116200 - R1-116.20
Et) Rate perc som. for 7.500 thick in	( texture o = - R1-116.20
1 (4m, bon 7.5 in thickness covery -+	TT = 13% caro Patran 1169 m
0-0	= 10 sqron Rate pen sq.m 116200 c. tennacenj- to75 = 1333 sqron . Rate pen sqron 1162.00 13.3 - R1. 116.20
	Scanned by CamScanner

		(male)				
	$e_{a cu ation} = materieak e_{approximate}$ $Lime = \frac{154}{1+2+54} = \frac{154}{8!} = 18.2 \text{ cu.m}, \text{ sunkhi} = 18.2 \text{ x?} = 36.4 \text{ eu.m}.$					
	Line = 154 3 - 131 =	18,2 ((1.10) , 54)	UCIN + IN XXX	Dory Contra		
	u ballock , is avera = 100 (u.m. http://oximatog.us. solution					
	Bib) with Icankar lume (UST moritar) - und 1 cum. Take - 10 cum					
1				4500.00		
	Brick ballast 1. class 25 gau	go socuro	450.00 (UM) UN, UN (UM)	1800.00	P	
	kankan lime	-(+) (++)	15.00 kg	180.00		
	molasles (Grun)	12163	45.00 2.5	45.00		
	Bail truct (7 rgin solution)	lumpsum	7010]	6525.00		
Contra la	Labourn- same as berr above Citem 3 d	\ \	(	3185.00		
		/			- n	
			tenials & 10 bour	9710.07	Ď į	
-	Add 15% water c	in nother		971,00	0	
	Add 10% worklade			1 10826	.50	
and a state of the	b.1.	per cura · Rr.	1082 UIN = RO	In San fur 1	0(410)	
	Rate	per curof - w.	119201	200500 /01		
	6) Rate per sqm. bor Loco th	NCK 1 C Letter	103 1409	) = K1.708.37		
	(i) Rate per sqim bon 7.5cm th	TUCLIC IQUIU	1- 100000	133 = \$1.81.	<b>ч</b> о ,	
-	Cem	ent concrete,		1 1 1 -		
-	Sum total quantity of de to divide 15.2 by the sum of the ne quantity of cement in cum	termining the	quantity of mate	Reals bur 10	the concrete is	
	to divide 15.2 by the surg of the ni	imenals of the pr	noportions + ++	re materials	which gover int	
-	quantity of cement in cum		in a state rill.	& proportine	n	
	Muthation - To bend the materiale	1017 110 CULID 1. 00 C	ement of L.M.	o pico o pico		
	$eemcont = \frac{15.2}{14478} = \frac{15.2}{13}$	- 1.17 Cum = S	ay 1.15 (cl.10)			
	Theretone, rand = 1.15×9 = 4.60 (1)	and ballag	H = 1.15×8 = 9	,20 cum.		
-	$reneros ang = 1.15 \times 9 = 9.60 \times 10^{-10}$	al proportions	t cement con	crete = 10 cu	(.10)	
Contraction of the local distribution of the	Materials nequined for diblence	A proportions a	i euro tatal a	nd dundunsy	by sun of the	
1	Quantity of materials may be call	alarg of 15.2 a	a schol bolice a		٥	
100	pre-polici lotti			ment		
				80 cum (84)	oays,	
- State			,20 cum 2. .40 cum 2.	.20 cum (86	barn)	
-			, so cura 1.	so cum (45	bass)	
-			7.60 cura 7.	'S (49 (34	to begg	
and and	1:5:10 9:	socum.	9.75 cum 0,	95 cun (281	5 bazs)	
1 1 1	1. (11) 9.	60 cum	9.00 (U-M 0	80 CU 10 124	bael	
1	E Cement concrete 1:5:10 in tound	etion on Floom	with Bruck bo	ulah torom	(15) Three gauge	
A. A.	-unit 1 cum. Take - 10 eurs,				Co1+	
	Parti cular	Quity on No-9	RI.	Rate P.	Ru l.	
1						
E	Materials -			CN.00	3860.60	
	Braick bailert 2st class 40mm gauge	9.50 cum	400.00 pen 400.00 pen	CUIV.	1900.00	
	sand	4.75 (u.m	6325.00 per		800 8.75	
	cement (283 bog)	0.95 (40)	129.00 14			
2	Labour -	/		Tutal=	11702.75	
	Mistrie (Head maron)	12 no. /1	160.00 peridas	7	80.00	
	Mason	1500. 11	50. Oppen dat	X	725.00	
	Mazdoon (Beldan)	12 1705.	8.00 Per doy		960.00	
	Boyon Woman costie	18 nos. 4 nos	80.00 per doy Fo. 00 per doy Fo. 00 per do	Y	1260.00	
	Bhati including curring sundnixed T. and P. etc	LUMPSUM	22. J OD 1,5.	0	240.00	
	in all purchy, etc.					

1. .....

Total= 2860.00				
T lal	at materials	and 1900m = 14568.75 218.50		
Add 15:1. water changes Add 10% contractors probit		1456.90		
Parts per (111) - R1. 16244.15/10 -	K. 162400	for locum		
& cement concrete 1:2:4 - and 1 cum T	ake - 10 (4.10)			
& (ement contents) Materials - Materials - Materials -	eo cum			
Material - Ratast 40mm gauge 8.5 stone ballast 40mm gauge 4.	40 cum	700,00 per cuin 3080.00 325-00 per cuin 13915.00		
cand (coakee) 4. cement (66 base) 2.	20 cu.m.	Total = 27915.00		
- Louit	5 nos.	160.00 penday 53.30 150.00 penday 300.00		
Malon Mozdoon (Beldan)	2 105	80.00 percent auto on		
BOY OF WORKS COOLS	20 nos	70.00 yen gay (1400.00)		
phioticincluding cutury	6nos	10.00 plique la contro		
Forms etc. (according to la failed	Lumpeum	600.00 L.C. 70.00 70.00 L.S 70.00		
Sundrives T. and P. etc.	Lumpsurg	Totce] : 3803.30		
	Tilal mater			
Add 151 water change	s mater I	420.70 2971.80		
Add for contractoris		Grand Total= 32020.80		
Rate por cum - R1.32020.00/10=	R1. 3202.00	fon LD CUM.		
T.R.C. C. WORK in Beams, slabs, ett. 1:2:	4 - unit 1 cu	m. Taxe - 1 CUM, Cost		
Panticulan	Contry on Nos	R. P. R. P.		
Majerials-		1000.00 pen cura 8800.00		
stone ballast aut J	2.50 cum	700, or per cum 3080,00		
sand (coance)	2.20 (4.10)	6325.00 per cum 139 15.00		
eement (66back) steel, mild eteel bans @ 1% = 1 cum.		3000.00 1Kng, 23550.00		
e Frid grewm = 1.5	7.859	AD, OD LEAKSY GOION		
Binding wine	1,2010	Total 19405.00		
Mistri (Head maron)	上の0.	160.00 per day 80.00		
Maron	3 00.	150,00 pen day USa OV		
Mazdoor (Beldar)	12 nos. 20 nos.	80.00 000 000 1400.00		
Boyin woman coolie	·6 nos.	70.00 per day		
Bhisti (including culuin)	Lumpsun	80.00 1.0		
sundrives T. and P. etc. Bending manking and bindingsteel bar		- 10509		
Bending chanking and bindingsteel bars	8 nos.	15000 penday (2000) 80.00 pendag 640.00		
Blacksmith	8nog	20.00		
Mazdvon (Beldan) Tand I.	Lumpsu	ro) - Total 1870.00		
(entering and shuttering (both enective) a dismantler) -	DE D	01.021		
dismantiand - Timber planks and ballics	Lumpsur	) 650.00 L		
Carroenter (11 class)	10 nos.	80.00 penday Stat.00		
Mazduore (beiding)	umpsi	40,00 L.S. 90,00		
Harls	Trubs			
		Total: 3070.00		

Total of materials and labour Add 151 water changes Add 10% contractor probit

anand Total- 64352:00 fer Locum

#### Rate per rum - Rs. 64052.2010 = R. 643.00 \_x--x--X

Brickwork with standard brick - Calculation of materials neguined for brickwork. Take a wall 12 brick 30cm nominal thickness is 20m length and son height. Honmany

valume= 20×0.3×5 = 30 (U.M.

Normally montanjoint will be less than Lon, taking com montanijont, the actual thickness of wall be sacro.

Therebone, actual volume = 20×0.29×5:29 cum. Number of standard bricks of secont location thomas size = 0.20×010×010 = 14500 005

Therefore, number of buck per cum (nominal) = 14500 : 484 noc Concidency 51. breakage, wastages, etc this may be taken 500 nos per 14, m 30

For 10 cum of brickwork 5000 bricks and required

Montan - Montan nequinement. total volume of brickwork minus net volume of brias - 29-1019×0.09×0.09×14500) = 29-22215= 6.685 cum. For troz billing for use ob (utbricin bonding, bin uniborn joints, wastages, etc 15% extra doritare may be required There for the volume of moritan - 6.685+6.685×0.15 = 7.688 cum For dry volume increase by 1/4 day volume of montant = 7.088 +1.922 - 9.61 cum.

For 30 cum ob brickwork, dry volume of mortan = 9.61 cum,

For 10 cur of brickwork, dry volume of mordan = 9.61× 10 = 3.2 cum

In practice, bott cement moritans cumeling moritan and lime moritan 35 (u.m. it dry moretan and taken but socies brickwoizk As an example soil dry moretan may be colculation of materials of mortan -

Approximate method to determine the quantity of materials of more an both Lo cum brickwork Divide 3 by the sun of the numerials of the propertion of materials which gives the quantity of coment in cum. As both exemple but brickwork in 116 coments 3 = 0.43 cum. Therefore sand: 0.43×6: 2.58 cum. But as the cement with mondan cement: go to bill up the voide in sant 1.45 cum to coment and 27 cum of sand may be taken.

1-I- class Brickwork in Foundation and	planth with 20×10×10 cm (nominal size) Bricks with cemant
sand montan 1:6- unit 1 cum. Take	-10 (U.M.

Particulate	Calify on MOS.	Rs.	P.	Rs. P.
Materials-				
Brick 1- class (500 bivides per 10.00)	BOOD NOS.		oven / noc	10000.00
cement (13.5 bags)	0,45 (4.17)		oper way	2846.00
sand (local)	a7 cum	400.0	D PER (UM)	1080.00
Labour -			Total	13926.25
Mistri (Head mason)	2 no.	160 52	penday	\$0.00
Mason	7 nos.	150.0	o pendag	10 50.00
Mardoon (Beldan)	7 nos.	80.0	ro peridag	560,00
Boyon woman coolie	7 nos.	70,0	To pen def	490.00
Bhisti (Water man)	2005	70.0	mper day	140.00
Sundrice T- and p. etc. (Misc. Pety thinge)	Lumpsum		0 L.S.	35.00
e e			Total =	2355.00
· · · · · · · · · · · · · · · · · · ·	otal obmaterials a	nglabou	• 17	16281.25
Add 151. water ch	angel	-	а. -	244. 25
Add 101 contracto	rc probt	-	- /	1628.00
	34 	6	mond Toto	1= 18153.5

15. J- class Brickwork in superistricture with 20×10×10 cm Brick with Lib cement sand

5. Monteen- unit 1 cu.m. Taxe- LO cu	1.19				P	SF
Peinti culans	RnHyon N	00	P. Ra	te		/>1
	~	0.	RJ.	r	Rs.	P.
Materials-						
Bruck 1- class (500 bricks per	5000 V	100	2000. 00	over 1 no	e 10000	
cement (13.5 bag) (11m)	0.45 11		6325.0	o per cur	n 2846.	25
sand(Local)	27 0		400.0	o pen cui	m 1080.	50
1 aboutt-				TOH		
Mistrice ( the colonicus)	12 nos			per day		
Mazolon (Beldan)	10 no		150.0	o'per dat ooper da	1500. 560.	
Boyon Nomen collie	10 00			50 per d		
phi sti	and	DS.		a per d	ay 140.	
scattolding	Lump	sun		.00° L-S.	0 130-35-	n N
sundries, T and p. etc.	Lun	perm	35	5-00 L.S.		
	1	1		Tot	2 3145	60
	Totalot	mala	ruals ar	nd labo	un 17071	25
Add 121 water changes				. (	256	. OD
Add 101. Contractors probet				-	1707	
			1		Total = 10	1034.25
Rate per cu	1 m - Rs. 1	9031-	25/10=	Re. 1903	.00	for 10 Lum
Hart Bruckwall CLUCM thick part	tion wall	Jurth	1:3 (010	ent nor	tan-unit1	-59.19-
Halt Bruckwall (2001) mich paint		10000	20,000			v ha calcula
Take - 150 Sq.M.	= IO CUM	henc.	e quarti	ity of mal	eruals mo	g De curcuit
Take - 100 SQIM 100 SQIM. Wall of LUCIM thickness as usual			V	U Ro	ite	Cost
Particulans		antig o	r Nos.	RJ.		1. <u></u>
1		0				
Materials_	)		o noe.	2000	. royer f nor	10000.00
Brick 1- class (SOD nos. )	eri cum)		euro	6325	.00 percump	47-43.75 1575.00
cement (222 bags)		2.2	scum		so per euro	
Mild steel barrs 6mm alia. C	Very 4th	1		30	DO PERKSY	1200.00
199 steel balls billing and lo	0	40	K g	T	otal	17518.75
				160.0	operiday	80.00
Mistrie (Head mason)		12	n0.		vo yenday	1807.00
Majon		12	nos.		vo purdag	640.00
Mardoor (Beldan)		8	noc.		ro per day	700,00
Boy on Woman coolie			nor		rs pen day	140.00
Bhisti			mpeure	1	2-100-0	160.00
scattolding		11	umpsu	m 35	5.00 2-5.	35.00
Sundriks Tand P. etc.			,		Total	3555,00
		Toto	nd mate	rials el	about	21073.7
Add the	5+ Watert c	hanges	1.1			316.00
Addia	Et Watert c o 1. Contr	actor	proof			2)17.2
					Giveno	Total: 2349
						5

Materials- Brick 2nd class Earth (learny soil) including wastage	5000 nos. 5.00 cum	2000. av pertino: 10000. ov - 15. ov pertino: 10000. ov Total= 10075. ov
Labour. etc Mistri (Head mason) Mazdoon (Berdan) Boy on Woman codbie Bhisti Scatbalding Sundirik T. and P. etc.	Lumpsum	$\frac{160.00}{150.00} periday 40.00 80.00 periday 1200.00 80.00 periday 920.00 70.00 periday 420.00 70.00 periday 420.00 140.00 L.S. 140.00 35.00 L.S. 35.00 Total = 2385.00 materials and labout = 12460.00 127.00$

Add 127. Wastag-water changes.

Ginand Total= 13893.00 for 10 cuts

Rate per cum - Re. 13893.00/10 = Rs. 1389.00

23. Courshed Rubble stone masoning in superstructure in 1:6 Cement Sand Mortan unit 1 (u.m. Take - 10 (u.m.

Panticulans	Quity on Noc.	Rate	cost,
-		Rs. P.	R1 P.
Materials - stone including through bona stone and wastage cement(18 base) sand on bajrie (10cal) Labo wit, etc Mistrie (Head mason) Mason Mason Mason Mason Bhisti scatbolding and " etc.	12.50 cum 0.60 cum 3.60 cum 3.60 cum 16 noc, 16 noc, 16 noc, 15 noc, 15 noc, 15 noc, 15 noc, 15 noc,	500.00 per cura 6325.00 per cura 400.00 per cura To tal 160.00 per day 150.00 per day 80.00 per day 70.00 per day 160.00 L.S. 35.00 L.S.	6250,00 3795.00 1440,00 11485.00 80.00 2400.00 1280.00 560.00 105.60 160.00 35.00
Add 10% contractorile Girrond Total	Total of maderical probit	-	4620.00 16105.00 1610.50 1610.50
Ginong Total Rate per	curg - R. 17	715.50/10 = R1. 177	H.00 trio

#### PLASTERING

Calculation & b quantify & montant and materials-Arrea & thickness geven the quantity of moretain for unitorian them tore filling up the jointe and to make up unitoring surchase ob wall, this maybe increased by 301. which will give wet mixed moretax. To get the total day volume of ingredient materials are moretare the wet volume may be burthere increased by 251. The quantity ob each material of the moretare may be tound by usual methods dividing the dry volume of moritan tog the sum of the numeriale of the prioportion and multiplying by the individual

Maderials pore 12mm thick plastering in wall bon 100 sq.mnumerical s

Wet mixed montan bon uniburn layer = 1.2 cum. Adding 305 to till up joints, uneven sunbaces, etc. the quantity of moretan corner to 1.a to 0.36 - 1.56 cu.m. Increasing by 251. the total dry volume = 1.95 cu.m. = 2.00 cum(say). For 1:6 coment sand moretan. (coment =  $\frac{2}{1+6} = 0.30$  cum sand = 0.30×6 = 1.80 cum. Similarly, the quantitie of materiale bore other proportions may be calculated. The quantities of materials bor dittement proportions are given in the bollowing page.

Materials bor 20mm this plastering in Wall bor 20059.00 -

As the thickness of plaster is more, 20% of moretan may be takes) to till up the joints, unevenness, etc. The quantity ob wet moretan is equal to 200×0,027 20% = 2.00 + 0.40 = 2.40 cum Increasing 25% the dry Volume: 2.40 + 0.60 = 3.00 cum. The quantities of each material of mortan may be bound by venal method.

Rich Moretan - Fore ruch moretan plastening, the quantities of materials will be less as the cement will be in excess than the voids in sand and the reduction in volume of dry moritan will be less.

Cealing plastering Lamm thick bor 100 sq.m - For plastering in R.r. ceiling the uneventeress of surface will be tess and 20% extra moretain may be taken to get unevenness even surface. The quantity of wet moretan is equal to too 100×0.012+ 20% = 1.2+0.24 = 1.44 cum Increasing by 251 the dry volume = 1.44 + 0.36 = 1.80 cu.m.

may be taken as 100 cum. For plastering in floor over lime concrete the same quantity of monter

as foir wall may be taken as there will be subbicient unevenness in the surpare of lime concrete.

Head cement blooking - For neat cement triniching in blook on dado on skinting, the thickness of near cement layer may be taken as 1.5mm (2) thick, therebone, the cement parte requirement bon 100 sqm=100× 0.0015 = 0.15 even. Dry volume at a ment in a regular by and marked by a land Dry volume of cement increased by 25% = 0.15+0.15×14=0.19 cum = 2 cum (303) = 6 bay per 100 19.10.

Materiale required bon platter	ing with dibberent i	norcharcs of various p	proportions but
For 12mm thick plasterin Montant	gstotal dry volume		
E) (ement montain	Proportion	cement	sand
es cement montan	7:5	o, 60 cum (18 bag	) 1.20 cum
(i) cement moritan	1:3	0.45 cum (13+6	a) 135 (1.m.
hu cement montan	1-4	0,40 cum (12 b)	ag) 1.60 (11 m
() cement montar	1:6	0.35 cun (105 b	175 cum
(V) Kankan lime	r	0.30 cum (9 b	ag) 1.40 cum
kill white time and surkhe on	4 • 4	1.80 cum kan	
and white time and sunkhion	till	1.00 cum Whit Seakhe on so	etimea 1.00 cum
		0. to cum white him	4 IMOCUM
(in cement, whole lime and said		and surchion san	d
		0.30 cumcement, v.s	soculinx and
For 20mm thick plastering	total dry volume	301.10	1.80 Chimsan
à) cement moritari	1:2		
G7 cement montan	1:3	1.00 cum (so bage	
the cement mortan	1:4	0.78 cum (21.4 bas	
(n) ciment montar	1:5	0.65 cum (1at bag	5 /
(v) cement montan	16	0.54 cum (16.2 bac	
28. 12mm plastering1:6- uni	f 1 cq. 10). Take = 100.	0.46 cum (13.8 bas 59.m	3°) 2.76 (u.m)
Parti culans	Quity on Mas	Rate	Cost
	0	Rs. P.	Ps. P.
Maderials -			1
cement (a bage)	0,20 (U.M.	6325.00 per cum	1297.50
sang cloca)	1.80 cum	400.00 per cum	720.00
Labour, etc.		Total	2617.50
Mistri (Head ma	3	160.00 PRA day	53.30
Mazdoon (Beldan) inc	Indian to nov.	150.00 per day	1500.00
raking of joints	1 15 005.	80.00 periday	1200.00
Bhisti including (cu	uniony) [3/4 nos.	70.00 Per day	52.50
that done wording T	and P. Lumpsur	90.002-5	90.00
candian's surgius			
scatbolding sundius t	et [ compste	Tol	al= 2895.80
6		101	5513.30
Total of	material and lak	101	5513.30 \$2.70
Total of	materiale and lak	50 UT	5513.30 \$2.70 \$51.30
Total of	material and lak	50 UT	5513.30 62.70 551.30
Total of Add 13 Add 10	r materiale and lak γ. water charges γ. contractor probe	Giriand T	5513.30 \$2.70 551.30 6147.30 for 100 Sq.n
Total of Add 13 Add 10	r materiale and lak γ. water charges γ. contractor probe	Giriand T	5513.30 \$2.70 551.30 6147.30 for 100 Sq.n
Total of Add 13 Add 10 Ro	He per sqm - R. 6	Gitiand T 147.30/10 = Rs. 61.50 and mortait - sur	5513.30 \$2.70 551.30 6147.30 for 100 Sq.n
Total of Add 13 Add 13 Add 10 Ro Bouch thick plastering Anished in dado - unit 1	He per sqm - R. 6	Gitiand T 147.30/10 = Rs. 61.50 and mortait - sur	5513.30 82.70 551.30 6147.30 fon 100 Sq.n bace nead cement
Total of Add 13 Add 13 Add 10 Ro Do. 12mm thick plastering tinished in dado - unit 1 Materiale	1 materiale and lak 1. water changes 1. contractor probe Le per sqm- R. 6 1:3 cement coarse sq.10. Take-100 c	Girvand T 147.30/10 = Pr. Gl.So and mortail - sur g.m. Labou	5513.30 \$2.70 \$51.30 oter 6147.30 for 100 Sq.n bace near cement
Total of Add 13 Add 13 Add 10 Ro Do. 12mm thick plastering tinished in dado - unit 1 Materiale	1 materiale and lak 1. water changes 1. contractor probe Le per sqm- R. 6 1:3 cement coarse sq.10. Take-100 c	Girvand T 147.30/10 = Pr. Gl.So and mortait - sur g.m. Labou Mistriel H	5513.30 \$2.70 \$2.70 \$51.30 total 6147.30 foin 100 Sq.n thace nead cement <u>R</u> - readmasol = nead.
Jo. 12mm thick plastering timished in dado - unit 1 <u>Materiale</u> cement (135bog	Materiale and lak 1. water changes 1. contractor probe- 1: contractor prob- 1:	Giriand T 147.30/10 = Ps. 61.50 and montail - sur q.m. Labou Nistriel H sup Mistriel H	5513.30 \$2.70 551.30 oten 6147.30 forr 100 Sq.n bace near cement R- eadmacol 2 new.
Jo. 12mm thick plastening tinished in dado - unit 1 Materiale cement (135 bog sand coarry	r materiale and lak i. water charges j. contractor probe yer sqm- K. 6 1:3 cement coarse sq.m. Take- 100 c 0.450 1.35 c 0.20	Giriand T 147.30/10 = Ps. GI.SO and mortail - sur q.m. Labou NistrielH magon Mazdovi Bhiefi	5513.30 \$2.70 551.30 oten 6147.30 for 100 Sq.n bace near cement 12 nor. Belda - 15 nor. 1 nor
Jo. 12mm thick plastering timished in dado - unit 1 Materiale cement (135 bog sand coange cement bor sunt timiching (6	Materiale and lak 1. water changes 1. contractor probe- 1. contractor probe- 1. contractor probe- 1. contractor probe- 1. contractor prob- 1. contrac	Gitiand T 147.30/10 = Rs. Gl.SO and montate - sur q.m. Labou NistrielH up MistrielH um Bhiefi sungnierT.	5513.30 \$2.70 551.30 oten 6147.30 fon 100 Sq.n bace near cement readmacol 12 nor. Belda - 15 non. 1 non 0000 1.01 4. 30.10
Jo. 12mm thick plastering timished in dado - unit 1 Materiale cement (135 bog sand coange cement bor sunt timiching (6	Materiale and lak 1. water changes 1. contractor probe- 1. contractor probe- 1. contractor probe- 1. contractor probe- 1. contractor prob- 1. contrac	Gitiand T 147.30/10 = Rs. Gl.SO and montate - sur q.m. Labou NistrielH up MistrielH um Bhiefi sungnierT.	5513.30 \$2.70 551.30 oten 6147.30 fon 100 Sq.n bace near cement readmacol 12 nor. Belda - 15 non. 1 non 0000 1.01 4. 30.10
Jo. 12mm thick plastening timished in dado - unit 1 Materiale cement (135 bog sand coange cement bor sunt timishing (6	r materiale and lak i. water charges j. contractor probe yer sqm- K. 6 1:3 cement coarse sq.m. Take- 100 c 0.450 1.35 c 0.20	Gitiand T 147.30/10 = Rs. Gl.SO and montate - sur q.m. Labou NistrielH up MistrielH um Bhiefi sungnierT.	5513.30 \$2.70 551.30 oten 6147.30 fon 100 Sq.n bace near cement readmacol 12 nor. Belda - 15 non. 1 non 0000 1.01 4. 30.10

The quantity of cement concrete may be calculated by multiplying area of slown thickness and the quantity of each material maybe bound on the same principle as bore cement concrete.

For 25 cm c.c. blook for 100 sq.m. of area the quantity of cement concrete = 100×0.025- 2.5 cum Adding 101 extra for unevendess of base concrete the quantity comes to 25+0.25=2.75 cu.m.

For LOD cum cement concrete the total day volume is materials is 125, i.e. approximately 50% more.

For a.5 cm thick c.c. bloom ob 1:2:4 proportion, boir 100 sqm total dry volume of materials = 2.75 + BOF = 2.75 + 1.375 = 4.125 cu.m. Therebork, cement =  $\frac{4.125}{1+2+4}$  ·  $\frac{4.125}{2}$  = 0.59 cu.m. = 0.60 cu.m. (18 bage), sond = 0.6×2=1.20 cum and stone aggregate = 0.6×4 = 2.40 cu.m. For neat cement surbace binishing additioned 0.2 cu.m. (6 bage) of cement will be required.

volume of matericals as above is equal to 9.125 cu.m. Therefore, cement- 9.125 . 4.125 = 0.75 cum = 22.5 bage, quantity of sand= 0.75×12 = 1.125 cu.m., and the quantity of stone aggregate= 0.75×3 = 2.25 cum. For neal rement binishing add extra cement of 0.2 cum(6 bage)

For for thick c.c. 1:214 Bloon 100 sq.m., total dry volume of concrete = 100×0.04 + 107 (bott unevenness) + 50% increases bott dry volume= 4.4 + 2.2=65 = 6.6 cum. Therebone, cement= <u>6.6</u> = 0.94 cum (20.2 bage), sand = 0.94×2 = 1.88 cum and stone aggregate= 0.94×9 = 3.76 cum. For near cement bruishow add extra cement of 0.2 cum c6 bage

tement in the proportion of 1:3 to 1:6 (colour pignent colour with near suntace colour. White cement mixed with colour pigment of the desired proportion may also be used, but tor striength it is better is originary portland cement is mixed with white cement in the proportion of 1:3 to 1:3 (grey poutland is mixed with white cement) and then to add colour pigment to have the desired

colouit. When colour pigement is mixed with white cement, the nequenof colour pigment is much left, may be 1:5 to 1:10 (pigment; white cement 33. a.5 cm (ement concrete Floor 1:2:4 und 1 sq.m. Take - 100 sq.m.

4 Se / Chron Where 1 100 -		Rafe	Cost
Panticulary	Quityon that	Re. P-	Ks. P.
Materials - stone ballast 20mm gauge Cstoregut) sand (coarke) cement (le bage)	7.40 (UM) 1.20 (UM) 0.60 cum	1000.00 реп сим 700.00 реп сим 6325.00 реп сим	3795.00
Labour, etc = (6 boy) Mistric (Head mason)	0.20 cum	6325.00 per cur Total: 160.00 peridox	
Mason Mazdorn (Beldan) Boyon woman cublic	10 not. 5 noc. 5 nos.	150.00 per day 80.00 per day	1500,00 403.07 350.00
Bhisti(including curung) side torrow sundruce T, and P. et.	2 nos. Lumpsum Lumpsum	70.00 periday 90.00 L-S. 35.00 L-S	140,00 90.00 35.00

Total- 2635.00					
Add 15% Water changes Totalofmaterials and labour - 10935.00					
Add 107. contractors priotit		1093.50			
Rate per squa - Rs. 12192.50/100 - Pr 1200 100 500 500					
39.2.5 cm cement concrete floor 1:13: Particulars	3 unit 1 sq.m. Tr	100 Sq.m.			
Particulan	Quity or Noc.	Rate	cost		
Materials	U	PC. P-	pe p.		
stone aggregate (greit) comm sand ( coarise) govege coment (21 brig)	2.25 cum 1.125 cum 0.75 cum	1000.00 per cum 706.00 per cum 6325.00 per cum	2850.0D 787.50 9743.75 1265.00		
coment bon surbace timishing	0.20 clum	6325. 5 per cum	9046.25		
Labourt- same as for items?		joraj	2635.00		
Add 15% water changes 175.20 Add 10% confractor's protet					
Rak jen som-Ri. 13021	155/100 - VI 120 1		otal - 13024-55 Bon 10019.0		
With white lime and suichi or sar Quantity of materials may be calc 1 10 cu. m. triom stem 1 of page	ulated proport	conately 7 001	to quartity		
Parcficulary	antity on thee.		the P.		
Materials - Bruck ballast I-clan form gouy who fertime staked surchs (orr sand) Labour, etc - Mistrie (Head mason) Mason Nazdoorn (Berdan)	7-50 cum 1.20 cum 2.40 cum 1.10. 100.	400.00 percum FOD.00 percum 350.00 percum Totaf 160.00 perday 150.00 perday 80.00 perday	4680.00		
Sundines Tand P. efe.	10 noc. 2 no. Lumpeum	TO.00 pendog TO.00 pendog 35.00 L-S. Totaf	700.00		
And 121. Wat And 101. cor	Total of materials i leri charges streactor's probil	and labour	6515.00 ; 97.75 651.50		
Kafe per sqm-f		61110071 Totel 72.50.	7264.25 po110059.001100		

Calculation of maderials born Mosaic Tennazo Floor bon 100 sq.m -20 mm thick C.C. 1:2:4 - Volume ob C.C - 100x 0.02 + 104 borr uneven and nough base - 2.00+0.20 = 2.20 EUM. Dry volume= 2.2+50%. = 2.2+1.1=3.3 CU.M. cement= 3.3 1+2+4=0.47 CU.M. (19.1 bage) sang=0.4722=0.94cu.m. stone chips = 0.47×9=1.88 cum. 6 mm Mosaic Layer 1:15 - Volume . & mosaic concrete 100×0.006 + 20% bon surbace cutting by nubbing = 0,60+0.12 = 0.72 (u.m. Dry volume = 0.72+50/ = 0.72+0.36= 1.08 cum cement =  $\frac{1.08}{1+1.5} = \frac{1.08}{25} = 0.4$  cum (12 bage) Martile chips - 0.4× 12=0.60 (1.0) Materiale bon mosaic layer bon dribenent proportion -E) Proportion 1:1 - Cement = 0.50 cum (15 bage), Marible chips = 0.5 cum. ti) Proportion 1:15 cement = 0.40 cum (12 bags), marible chips = 0.6 cum. (i) Proportion 1:2-Ciment=0.36 cum (10.8 bay), marble chips = 0.72 cum () To get whittish base (ground) 101: to 201: of markle dust may be make & with portand cement.

Mosaic Dado on Skinching - 6 mm thick mosaic layer over somm thick rement places 1:3 cement: coanse sand! Materials bort cement montan same as in easy ge, material bort mosaic layer to be same as above. Labour may be increased by 10% over -----Masaic on Tennazo Tale Floon - unit I sq.m. Take - 100 sq.m.

Mosaic or Terrazo Tele Floor - unit	I sq.m. Take-1	Rate	Cost
Particulares	Rntty or Nos.	Re. P.	R. P.
Materials-			
Mosaic Tiles 200mx200m norman cize 2500 mos.	100 sqm	300.00 per cum	30000.00
20mm lime montan - white lime (slaked)	1 cum	700.00 per cu.m	700.00
scutckhi	2 (4.17)	350.00 per cu.m	700.00
cement (for neat cement paste or grout bor loying tiles and bor	0.20 cum	6325.00 per cum	1265.00
joints bracks		Total	32665.00
Labour etc. Nistrie (Headmason)	100.	160.00 per day	160.00
Majon (Specialist)	15005	150.00 peri day 20.00 peri day	2250.00
Mazdoon (Beldan) Dhisti	15005.	70.00 per day	105 00
Paliohert	120 mos. L.S.	US0.00 2-5.	450.00
Polishing stone grafic accid powerr	2.5.	90.00 L.S. 90.00 L.S.	90.00
Sundicies T. and P. etc.	L-C	Total	
	Total of mat	ercials and labow	π 45410.00 681.00
Add 121- water	n changes		9541.00
had 10% contric			[ofa]= 50832.1
Rade per squer-	- Rs. 50632.00/	100 = RS. 506.00	fon loosg

Bruck Floor Local thick surface pointed with rement moritain-Requirement of materials for 100 squer - Brick bloom 10 cm thick 1005 que is equal to 100×0.10 = 10 cum Hence materials requerement is same by for is equal to took of the tool excess morehan may be taken for unevenness of the run. brickwords but 10% excess morehan may be taken for unevenness of base. For pointing 0.6 cum total dry morehan is trequined. For brick bloor laid with 1.6 cement morehan the quantity of materials are - Brick = 5000 no, with 1.6 cement morehan the quantity of materials are - Brick = 5000 no, cement = 0.5 cum (15 bags) and sand = 3.0 cum. for pointing 1:2 - cement contening (6 bags) and sand=0.4 cum are required. Similarly, materials

ton other proportions may be calculated. 42. Brick Floor Locon thick cement pointed - unit I sqm. Taxe - 100 sq.m. 1.6 monthan, surchase pointed 1:2 rement monthan.

a) Bricklaid 1:6 mondan, surface pair	nted T: 2 came	Rod . T	Cost
Particulars	a Nor		fs. P-
BRICKWORK- Maferials born bruck lay ung- Bruck I-claus cement (15 bage) sand local	5000 noc. 0.50 cum 3.00 cum	2000.00 pert eum 63.75.00 pert cum 400.00 pert	10000.00 3162.50 1200.00
Labour of brick laying- Mictri (Headmaron) Mason Mason Mazdoon (Beldan) Boy on woman coolie Bhisti Sundniek, T. and P. etc.	10 nos. 10 nos. 8 noc. 6 nos. 2 nos. Lumpsum	Total = 160.00 penday 150.00 penday 80.00 penday 70.00 penday 70.00 penday 35.00 pens. Total	14262.50 80.00 1500.00 640.00 420.00 70.00 35.00 2745.00
cement pointing- Materials- cement (6 bask) sand (local)	0,20 rum	6325.00 pert euro 400,00 pert euro	1265,00
Labour, etc Mistrie (Head Mason) Mowon Mazof oor (Beldan) Bhisti scattolding sundraw Tand etc	10 noc. 10 noc. 10 nos. 12 no. Lumpsum	Total 160.00 penda 150.00 penda ev. 00 penda to.00 penda 55.00 L-S. Tota	53,30 1500,00 25.00 55.00
	1. Waler change		W: 3868.0 2097-5.50 70.97-5.50 70.97-50 1 R1. 23287-60 1 R1. 23287-60 1 R0. 234.00
Rate	peresq.m - Ks.	2850 1.00/100	Kg. 234.00

16 (2) while washing one cod - unit 1 of 20, Tate - 100 cf. m. Particular A Print My a Hu. R. Rate P. Particular A Print My a Hu. R. P. Particular A Print Particular A Print Mission (Particular A Print Mission (Particular) Particular A Print Particular A Print Mission (Particular) Particular A Print Particular A Print Particular A Print Particular Particular A Print Particular A Print Particular A Print Particular Particular A Print Particular A Print Parti Particular A Print Particular A Print Particular Particular Parti	tion and and and - UDE	1 sgm. Take	- 100 59.	രി.	
Electricals - While time unslaked@usp.os per cym Give provederi surrethic Corr so na) Labourit - Boy explice Sundrives, T. and I. etc Materials - Control (Second) Labourit - Sundrives, T. and P. etc. Control (Second) Sundrives, Sundrives, Sundrives	(i) white washing one cours and	Quitty on Nos.	L Ro	ite.	Cost
With pen cgmLorgS. 60 L.S.S. 60Gilux poinderLump cumS. 60 L.S.S. 60Surrethi For sondLump cumTotalSo. 60Boy coliaS. 60 L.S.S. 60Sundries, T. and I. ettJ/s no.100.00 pen dayAdd 101: confirmation's proteiTotal100.00 pen dayAdd 101: confirmation's proteiTotal100.00 pen dayRate pen sq. n - R. 185.09/100 - Rr. 1.85Total100.00 pen dayRate pen sq. n - R. 185.09/100 - Rr. 1.85Groont Total 1 100 Sq. 60So. 20 ContractoritiesContractorities proteiTotal 1 100 Sq. 60So. 20 ContractoritiesContractorities proteiSo. 60Rate pen sq. n - R. 185.09/100 - Rr. 1.85Groont Total 1 200.00So. 20 pen dayContractorities proteinContractorities proteinSo. 20 pen daySo. 20 pen daySo. 20So. 20 pen daySo. 20So. 20	Pareticulan's	٩	Re-	۴.	KA. P :
Gilux poinder       Lorg       S. 10 L.S.       S. 00         Gilux poinder       Lump cum       S. 10 L.S.       S. 00         Loboutt       Which washert       9/9 no.       100.00 per day       66.76         Bay colie       Jan no.       100.00 per day       66.76         Sundrises, T. and P. etc.       Jan no.       100.00 per day       66.76         Lump cum       S. 60 L.S.       S. 00       S. 00       S. 00         Add 101: confination is protei       Total materials is labout.       100.00 per day       66.76         Rate per sq.m - R. 105.20/100 - Pr. 1-05       Grand Total: 100.00 per day       66.80         Rate per sq.m - R. 105.20/100 - Pr. 1-05       Jon 100 Sq.0       Jon 100 Sq.0         Ferriticulard       Query on the       Printicular       Granty on the         per nticulard       Query on the       Printicular       Contractore         contractife       Galo cum       Solo cum       Solo cum         Solo cum       Solo cum       Solo cum       Solo cum         Solo cum       Solo cum       Solo cum       Total       20.00         Kate per sqlip       Solo cum       Solo cum       Total       20.00         Solo cum       Solo cum       Solo cum<					
Give poinderi surrekhi (on sona) Labourne L	White time unslaked@400.00	1549	4.00	penkg	
Contraction (Contraction) (Con	periegin	U U			
Labourie Labouries (Line Labouries (Line) (L	Gille powden				5.00
Underwalter Boy cooling Sundaires, T. and I. etc Sundaires, T. and I. etc. Sundaires, T. and I. etc. Sundaires, T. and I. etc. Sundaires, T. and I. etc. Sundaires, T. and I. etc. Add 15/: water changes Add 15/: Contractor's probed Sundaires, T. and I. etc. Add 15/: Contractor's probed Sundaires, T. and I. etc. Add 15/: Contractor's probed Sundaires, T. and I. etc. Sundaires, T. and I. etc. Add 15/: Contractor's probed Sundaires, T. and T. etc. Sundaires, Sundaires, Sundaires		Lumpeuro			50.60
Boy colip Sundrices, T. and I. etc. Sundrices, T. and I. etc. Add 10% Contractoris probid Sundrices, T. and I. etc. Add 10% Contractoris probid Sundrices, T. and I. etc. Sundrices, T. and I. etc. Add 10% Contractoris probid Sundrices, T. and I. etc. Sundrices, T. and I. etc. Add 10% Contractoris probid Sundrices, T. and I. etc. Sundrices, Sundrices, Sundrices	white washer	26.00			14 66.70
Sundicited, 1, only 1, etc. (umprum) 5.60 (-5, 0) 5.60 Total material, 100, 100, 100, 100, 100, 100, 100, 10	Boy colip		100	, os per de	0
Ad toi: confractorie protein Total materials i labouri - 16240 Rate per sq.in - Ri. 185.20/100 - Ri. 1.85 Rate per sq.in - Ri. 185.20/100 - Ri. 1.85 Science Protein Contractories protein Science Pro	Sundicies, T. and I. etc				5.00
Add 101: confraction's proteil Rate per sq10 - R1.125.20/100 - Rr.1.25 Grand Total: 122.00 56. 200 Thick Damp front (ourse(D.P.C) with eement montan 1:2. unit 1 59m. Tarr.100.9m. particularia Rate R. P. Rate R. P. Materical(C- tement (27 bogn) Sand (coarce) (em-seal on Impermo (2109, Per hog ob cement) Labour, etc Mietric (Headmason) Maton Maton (Beldan) Ebisti (Including runing) Form insides Sundruce T. and P. etc. Add 15% water changes Add 15% water changes Add 10% Contractoris probed (anord Total: 105.00 Form Total: 100.00 Total: 2032.00 100.00 per day 100.00 per day 10		/ competition	+		118,40
Add 101: confraction's proteil Rate per sq10 - R1.125.20/100 - Rr.1.25 Grand Total: 122.00 56. 200 Thick Damp front (ourse(D.P.C) with eement montan 1:2. unit 1 59m. Tarr.100.9m. particularia Rate R. P. Rate R. P. Materical(C- tement (27 bogn) Sand (coarce) (em-seal on Impermo (2109, Per hog ob cement) Labour, etc Mietric (Headmason) Maton Maton (Beldan) Ebisti (Including runing) Form insides Sundruce T. and P. etc. Add 15% water changes Add 15% water changes Add 10% Contractoris probed (anord Total: 105.00 Form Total: 100.00 Total: 2032.00 100.00 per day 100.00 per day 10		Total m	aterials	1 labour	. 168.400
Rate per sq.19 - R. 185.20/100 - R. 1.85 56. Rem Thick Damp froot (course(D.p.c) with eement mantar 1:2 - unit 1 591). Taxe 100.99. per nticulared Quitse(D.p.c) with eement mantar 1:2 - unit 1 591). Taxe 100.99. per nticulared Quitse(D.p.c) with eement mantar 1:2 - unit 1 591). Taxe 100.99. Per nticulared Quitse(D.p.c) with eement mantar 1:2 - unit 1 591). Taxe 100.99. Rate Rate Rate Rate Rate Rate Rate Rate	Add 101 confrian	cforc's protet	,		08.81
Rate per sq.m - R. 185. 20/100 - R. 1.85 56. 200 Thick Dampfroof Course(D.P.C) with eement member 1:2 - unit 1 scm. Taxo-10059m. particularia Rate R. R. Rate Cost particularia Rate P. Re. P. Materials- Cost Rate R. P. Re. P. Materials- tement (27 bogn) Sand (coarse) cem-seal on Impermo(12kg.pabog ob cum. 1.80 cum. 1.80 cum. 1.80 cum. 1.80 cum. 1.80 cum. 1.80 cum. 100.00 fer kg. 1000.00 Total 2032.00 Macon Macon Son (Beldan) shigh (michiding curring) Form insides Sundrics T. and P. etc. Add 157. water changes Add 157. water changes Add 157. contractoris probid Canad Total: 10545.00 Canad To		,		Ginan	A Tofol: 185.20
56. 201 Thick Damp front (ounseld.p.c) with eement mentan 1:2. unit 1 syn, late for the cost in particular. (anti-cular.) Rate cost in the particular. (anti-cular.) Rate cost in the particular. (anti-cular.) Rate cost in the cost in the particular. (anti-cular.) Rate cost in the cost in the particular. (anti-cular.) Sand (coarse) (coa	Dala per 1910 - RI. 185.	20/100 - Rr. 1.85	2		for 100 59.00
Materials (127 bogn) Sand (coanse) (em-seal on Impermo (sing, parbog b cemient) Labour, etc Mistri (Headmason) Rhisti (Including (uning)) Form insides Sundrics T. and P. etc. Add 157. Water changes Add 107. Contractoris probit (anond Total: 105000, 20, 00 1.80 cum. 1.80 cum. 1.00 per day 1.00 per	Raje par solution				+ 1 59m Taro-10059.m.
Materials (127 bogn) Sand (coanse) (em-seal on Impermo (sing, parbog b cemient) Labour, etc Mistri (Headmason) Rhisti (Including (uning)) Form insides Sundrics T. and P. etc. Add 157. Water changes Add 107. Contractoris probit (anond Total: 105000, 20, 00 1.80 cum. 1.80 cum. 1.00 per day 1.00 per	- 2 cp Thick Drop Profit (ourseld.p.c)	with eement	mantan	Rale	cost
- Materials- tement (27 baga) Sand (coarse) cem-seal on Imperimo(sug. perhog ob cement) Labour, etc Mistrii (Headmason) Mazon Mazopon (Beldan) Shish (including turning) Form insides Sundriids T. and P. etc. Add 15t. water changes Add 10t. Contractoris problet Gaand Total: 10545.KS	56. aut the Date floor	QUETY ON N	oz /	RI.	P. Re. P.
Malerials - Malerials - Labour, etc Mictrie (Headmason) Rhishi (menuding turning) Form insides Sundrics T. and P. etc. Add 15% water changes Add 15% contractoris probet Malerials - Malerials - Maleri	patencelle	U U			
cement (27 bogg) Sand (coarce) (em-seal on Imperimo (1kg, per bog ob cement) Labour, etc Mictrie (Headmason) Mason Mason Bhisti (including turking) Form insides Sundrice T. and P. etc. Add 15% water changes Add 10% Contractoris probet (anand Total: 1056.00 100.00 per day 100.00 per da	- on heredis-			6325.00	
Sand (coarree) (em-seal on Imperimo (sing, parbog ob cement) Labour, etc Micfrie (Headmason) Mason Mason Mason Phistic (including curring) Form insvides Sundrics T. and P. etc. Add 157: water changes Add 107: Contractoris probid (mand Total: 10545.15 1.80 curring) 1.80 curring 27.00 kg. 100.00 peri day 100.00 peri day 100.0				700.00	year cum 1260.00
cem-seal on Imperimo cilic planas ob cement) 27.00 129. Labour, etc Mictrie (Headmason) Mason Mason Mazonon (Beldan) Bhisti (including turking) Form insvides Sundrics T. and P. etc. Add 157. water changes Add 107. Contractoris probit Gnard Total: 10545.K	Cond ( COULCU)		u		10 00 003
Labour, etc Mictrie (Headmason) Mason Mazohon (Beldan) Bhish (including (uning)) Form insides Sundrics T. and P. etc. Add 157. Water changes Add 157. Water changes	come coul or mermour pro	1 00 27.00 1	29.		
Mictrie (Headmason) Maxon Maxon Mazoloon (Beldan) Bhish (including curring) Form insides Sundrics T. and P. etc. Add 15t. water changes Add 10t. Contractoris probit Grand Total: 10545.KC		")			•
Malon Malon Mazdoon (Beldan) Bhisti (including (unting) Forton insides Sundruics T. and P. etc. Add 157. water changes Add 157. water changes Add 157. contractoris probit (Gnand Total: 10545.KC	Labour, er	2 no.		160.00 P	eriday 80.00
Mazdoon (Beldan) Phisti (including running) Form insides Sundrices Sundrices Add 157. Water changes Add 157. Water changes Add 157. Water changes Add 157. Contracton's probit Grand Total: 10545.KC		5 nos		ISA NO P	en day 1 + 50,000
Bhisti (moluding (unding) Form insides Sundrics T. and P. etc. Add 15: water changes Add 15: Contractoris probit Add 10: Contractoris probit Grand Total: 10545.K	Mazdoon (Beldan)	1 5 000		80.00	percond
Fortion insides Sundruics T. and P. etc. Lumpsum Add 157. water changes Add 157. water changes Add 107. Contractoris probet Grand Total: 10545.K5	phisti (including) (ulu	13) [ Inc			and land
Sundrics T. and P. etc. [Lumpsure] Total - 1925-00 Total - 1925-00 Total - 1925-00 Total - 1925-00 191.90 191.90 945.75 Add 15% Contractoris probrit Gnard Total - 10545.K5	Form insides	LUIOP		90.00	1.5. 535.00
Add 127. water changes Add 127. water changes Add 10% Contractoris probit (Grand Total: 10545.K)	Sundruics T. and P. etc.	Lum	sum	-	
Add 15% water changes Add 10% Contractoris probit (Grand Total: 10545.15		1			
Add 10% Contractions prototot (Grand Total: 10545.K		solen channe	Tofal	obmateric	
Grand Total: 10545.15	Add 151	contraction's	andi		
	rdd luy	Unitudous	PICOPUT	1	
Rote hor com De 10545-10/100 - re 105 mt (for 100 69.00)				6	
$f(w) \in p(x, y, \eta) \rightarrow N_{x}, f(y, \eta) \rightarrow N$	Rate per sq.m	~ Re. 105415.1	0/100 =	Ks. 105.00	ton 100 69.00)

77. Asbestos cement sheet cecling 6mm thick, with 40mm X20mm teak wood brading (Excluding Friame)-unit 1 sqm. Take a 11000 1.50m X 6.30m Anea = 28.35 sq.m.

		V .
Materials - Asbestos rement sheet plain 6mm thick		
including 51 wastages = 28.35+ 1.42 = 29.77 sq.n	100.00 sqm	2977.00
Teak wood beading assuming gormxgorn	,	
panels = [(8nos. ×1.5+6 nos×6.30) x 0.04x		1000 00
0.02 ] + 101 Wastages = 0.065 cum 0.065 cum	3000.09 CUM 60.00 per kg	1950.00
SCHEN SOME ASDNO.	60.00 per 100	270.00
Mails 50mm Irg.	30.00/kg	30.00
Labourt, etc.	100. mpenda	12 26.70
Mictra (Head mason) 1/6 no.	120 UD Ver da	
Canpenterr 2 nos. Mardron (Beldan) 2 nos.	80,00 por da	160.00
scattolding lumpsum		30.00
summies, It and I de l'umpsum	30.00 2-5	bow = 5878.90 \$87.90
Add 10% Contractor's probit	materious	
	Grand Tota	a) 6466.80.
Rate per sqim - Kr. 6466. (	60/28.35 = W. 2	128.10 L. tor 22.35
64. Wood-work in charkhad on Friame - Wrought, Friamed	d and fixed -	unit 1 cum.
Salwood work - Take a briance on chankbat of 200% 1200	em doote witho	ut cill of extran
of salwoog		
Materials -		
Materials - Timber 5.48×0.08×0.12 0.053 (UM) (L= 2×2.14+1×1.2= 5.48) Waster 5.4		
Washije Dr.		1000 67
Labour, etc. 0.056 cum 250	DOD. JD YER CUM	1400.00
Mistri (cargersten) to no. 18	0.00 per day	11.25
carpenter 3/4 no.	20. or periday	90.00
a line Trando ale 12	15.00 1-5	15.00
sundrule, ) and richting frümpsung	Totalob lov	DOLA 151.25
Total of maleria	ls and labour	1551.25
Add roy contractoris probit	h	155.10
Role per cum (dividing by 0.053) -	Ginand Total R: 1706.35/0 R	1706.35 53 = R. 32195.00
not part contract 0 0 1		">> " N. 32145 0

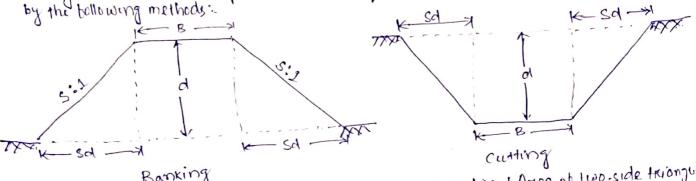
66. 4mm Thick Panel	led Doon	if Indian	Trak Wood	t - unit 1	Sq.m	and the second sec
Toke a window s	hutten 100	VIDOCIOI(2	hurten only	- Arrea = 1.5	Sgm. (Pyna)	
Parcticulans	No. [ _	13 Thic	kness Onthe		Le Cos	.4
Materials-		m "1			r. Re	P
TEMPORT	4 1.50	0.075 0.0	4 0.02			
stèles	2 1.00	0.075 0.	1 101 2	T		
Sach bass verticles (15mm insertio) $L= 150-(2\times7.5)+(2\times10)$						
= 138(1)= 1.3870		0.04 0	-04 0.00	8		
(ismm incention)=						
50-(2×7.5)+(2×1.5) = 38cm=0.28	6 0.38	0.04	0.04 0.0	03		
Add 51 for wasta	je		0.0			
Brass tittings -				202 2020	50.00 1295	.00
Fittings - Towers bo	11 30 cm (14	yen)		Strong		
	olt 15cm (1			$n_{0}$ $70.1$	vo each \$ 90.	50
Hinges 1		/		000 6.1	50 each IPT.	
Briass he	andle		1	anac 19.	in each 18.	50
	cleat 5cm (tori .	wooden c'		2 nor 1 3	or each 16.	50
thinges a scriews	DCM (for	00000				.50
	c 20000	_		50 nox. 20 1.00 sg.m 3	00 00 per sqm ),3	00.00
Gilassbans 16 noc 7	(16.5×33.1	5 (m =	)-1+(2×1.5)			5
1.00 Sqm B 14. = 4[150-(	(18.5×33.1) meadth=5[	3500	-17 - 02750			
		11+(241.	51.000	Lumpsun	Do person )	25.00
1.17. = = = = = = = = = = = = = = = = = = =	ails borr be	xingpan	US		Total	1825.50
1 bourdett-				1		
Labour, etc- Michiel	(ampenter)	) .	-	isno.	180.00 perdag	12,00
Carpent	eri			anos.	120, vo pen darf	70.00 -
enal D	holien			1 00	70.00 pendag	20.00
puttyse	glue, etc. T. and P. e	4		Lumpsun	1	15.00
Sundrucs	T. ang t. e	71-		Chingson	Total	357-00
				-		2122.50
Total rt	materials	anglabi			1 5.1-	r = 2400.75
Add 101.	CONHILLOU	12		1	Grand lore	bon 1.559m
	Rate	pert som-	Re. 2400.75	4.5 = FL. 160	0.00	

Lead and Lift: Normally earthwork is estimated for 30 m lead for distance and 1-5m labt born height on depth, and this distance of 20m and the height of 1.5m and known known as normal lead and lift. Normal rate for earthwork is bor zom lead and 1.5m 1261. For greater read on 1-61 the nates will be different bor every unit of 30m lead and bon every unit of 1.5m libt. The earthwork is, therefore, estimated reparately bon eveny som lead and ton eveny 1.5m 1261.

For the calculation of earthwork in a read comptudined section and choss-section of the ground are taken and the borrmation line is fixed. The trommation line is lixed in consideration is blied level gradient, height ob bonk, depth ob cutting, etc. In plain countries ricad is usually in banking, but it the ricad is in jutting bur same length and in banking bur some other length, the excavated earth from the cutting portion should be utilised for the banking portion within economical limite during the execution of the words. But bore ectimating of earthwork this point of utilising excavated earth triom culting in centain length in banking of the adjacent may not be taken into account to avoid complicacy. In helly countries moved is usually both in banking and in cutting and the executed eanth briom cutting is utilised for banking within economical limits 1 mits

Calculation of lead Elitt.

Choss-section of canthwork of nood in banking on in cutting is usually in the tran of trapezour, and the quantity of canthwork may be calculated



Sectional anea= Ariea of rentrial nectangular portion + Ariea of two-side triongular = Bd+a(tsdxd) = Bd+sd2

Sil is the matio ob side slopes as horrizontal ventical, fore 1 ventical, horrizontaliss

bon d ventical, horizontal is sd. When the ground is in a lingitudinal slope, the height of bank on the depth of cutting will be dibbenent at the two ends of the section, and mean height on depihment be taken for "d" and sectional area at migh-cection is taken out bor mean height.

Attennatively, sectional area at the two ende may be calculated and the mean of two sectional area is taken out. Sectional area at the mid section on the mean sectional

arrea, multiplied by the length gives the quantity. Mean height = ditdz

Dibberent kinds of soil as sandy, clayey, nocky etc. estimated separately as the rater vary.

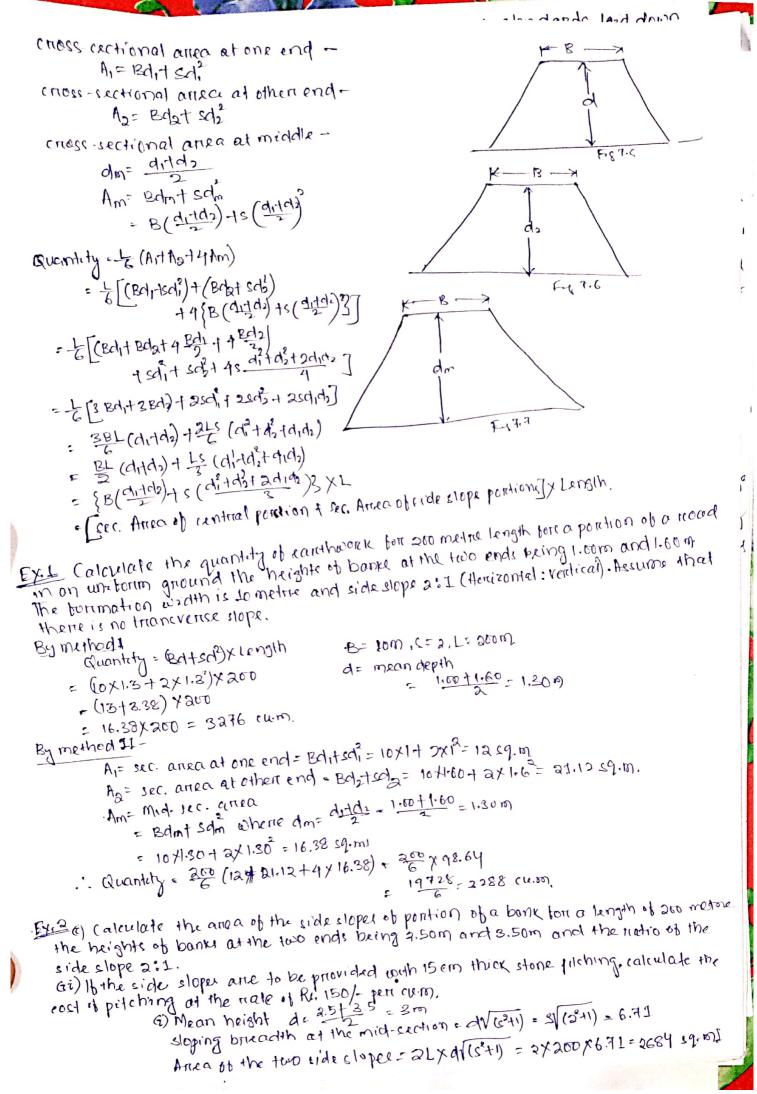
Quantity of earthwork may be calculated by the various methods of measuration out of which three methods are give of

Method. I. Mid-sectional Arrea Method: Quantity-Area of mid-section X length. Let d, and, do be the height of bank at two ends portion of embankment. I the length of the eection, B the tormation ordth and sol (horizontal : vertical) the side slope, this

Anea of mid section : Anea of nectangular purction + anea of two triangular portion,
= Bdmt = sdmt = Bdmt sdm K-B-X
. Quantity of eanthwork = (Balant sda) XL
Grenerial, Q= (Bdfsd)×L, where d stands burn
mean height ondepili,
K-sdm
The quantities of carithwork may be calculated in a tabular borrine as below.
station Depth Mean Aneast Anead Total Length Quantity
chainage Height Height Pontian sde Anea statione Embank, (utting
Atrea of side sloping sunface -
Atrea of side sloping sunface — The arrea of sides which may nequine tenting on pitching, may be trund by multiplying the mean sloping breadth by the length. The mean sloping breadth of the length.
multiplying the mean sloping breadth by the length.
The mean sloping breadth = (satd) = Vst1, where d stands ton mean d. Arread both side sloper. 21x dV32
Arrea of both side sloper, al rayst form
This also may be calculated in a tabulax borron -
station or Depth Mean Breadth of side sloper Length Total Arrea . b both
(married le Marcha Houth I and the stand the stand stand
sicping billedanti standine 2LaVeti
Method. II- Mean sectional Anza Method:
Quantity = Mean sectional arrea x 100000 arrea at the other and
suctional arrea alone end A1= Editsd. sectional centra at the height on depths at the two ende. A0= Editsde, d, and da arre the height on depths at the two ende.
The mean sectional arrea A = Aith2, quantity Q= Aith2 xLength.
The mean sectional arrea $n = -2$ , quanting a 2
The quantities of earthwork may be calculated in a tobular tonin as given belows.
chainage Depth Ronting sider Stational Sectional Section
chainage Deprin kontrog sd Bdtsde Anea eration Embority cutting
Method. 111 Priemoidal Formulo method: Quantityon volume = = (A1+A2+4Am)
where A and A are the crose-sectional arreces at the two ends to a portion of
erobankment of a read of length L, and Am is the mid-sanctional area.

embankment ob a read of length L, and Amis the mid-sanctional area. Let d, and do be the heights of banks at the two ends, and dimbe the means height at the mid-section, B be the borrmations width and s: I be the side slope,

Cross sectional arrea alone end - A1 = Bd1 + Ed2



(ii) Quantity of pitching = Aneax thickness = 2684 × 0.15 = 402.6 cum.

loct of stone pilching = 402.6× 150.00 = R. 60390.00

extensive triavelling at on within a short distance triom his headquarters born which no triavelling allowance is and marily admissible and he Lonveyance Allowance no travelling allowance is originarily admissible, and he maintaine a some sort of conveyance for enticient discharge of his officials functions. a conveyance Allowance PER month is granted by the competent authority. The conveyance may be a carr, a motor eycle, on a cycle according to the class ob officer, and the allowance is meant for the maintenance and up keep of the conveyance. In the monthly bell a certificate to the object that the two at conveyance is maintained in a call bailing and that is to be ebbed that the type of conveyance is maintained in a sofis bactory condition is to be given. If the officent travels longers distance and draws travelling allowance kalometre (maleage) basis, then his monthly conveyance allowance box that day should be deducted to the duties of the government is such that he is required to maintain a horse, the conveyance granted to him is known as Horse Allowonce.

Conveyance changes means the changer mode by the Licensee burithe conveyance obgas, a convergence services means all services priovided by the Licensee of convergent gas to through and within the Licensed Arica. "Formula reciri" means a year commons of on set January." Methoonk code. means the network code as prepared by the Locencer

Conveyance changer means the stamp duty and the megistriation changes as per provision of the Applicable Law and all incedental and legal costs and expenses bon preparation and execution of the Sub-Leave Deed bon the trioniter of ownership of the Apaintment in barown of the Applicant upon completion / Part completion of the Aparetment and clean ance of all dues in terror here of to

Royality changes: A noyality change is a payment that a licensee makes to alicense noyaling changes in the use of them licenced asset. In construction, this asset round be in exchange bon the use of them licenced asset. In construction, this asset round be a new technology, prioduct, system, material on decign, penhaps incorporating intellectual property assets like patents, know-how and trademanke Regalty changes are whally agreed as a percentage of sales generated by the licenced are including agreed as a percentage of sales generated by the licensed ased. In some circumstances, they are set as a fixed price. Royality

one changed on an ongoing basis The amount that the licensee much pay is outlined in a moyality agreement. This agreement also specefies how the licence may use the licensed and where they can we it and bon how long.

Mostriact cost of estimate

The cost of each item of work is calculated in a tabulan borin binors) the quantities already computed and total cost as worked out in Abstriad of Estimate toting. The reates of dibberiend items of word are taken a per schedule it hater one current workable nader on analyced nader box binished descrip work, A percentage usually 3% of the estimated cost is added to allow borr contigencies borr miscal miscelaneous petty items which donal come under any classified head of steme of work and a percentage obaboul 21 is provided bor would hanged establishment The Grand Total thus obtained gives the estimated coch ob work.

The defailed estimate is usually prepared work wise, under each sub work as main building, servants quartance, gamage, boundary wall s, etc.

The detailed estimate is accompanied with 1.

- () Report
- (e) Grenenal specification.
- (3) Detailed specification, Sectional elevation, Detailed drawings, site plan at ( (2) Dirawing: plan, elevation, Sectional elevation, Detailed drawings, site plan at ( layout plan on index plan etc.

(5) calculation and designs - Designs of toundation, beam, clab, lintel, design of channel in case of vivilgation channel, design of thickness of metal trust in case of

(6) Analysis of mates, if males are not as per schedule of mates on bon the non-schedul 7.10001

Valuation: Valuation is the technique of estimating on determining the bair price on value of a property such as a building, a bactory, other engineering structure of various types, land, etc. By valuation the present value of a property is determined. The present value of property may be decided by its selling price, on income on nent it may betch. The value of property depends on its structure, libe, maintenance, location bank interest, legal control, off. The value also depends of supply on demond and the purpose bon which valuation is neguined.

Cost means original cost of construction of purchase, while values means (saleable value) while home of construction of purchase, while values means the present veilue (saleable value) which may be higher on lower than the cost. A building whole cost of construction is R. 50,000.00, when put bon sale may betch R. CO. 000.00 this sale price is the value of the building. Similarly, the value may be tess than the original 1001.

Turpose of valuation. - The main purpose of valuation are as bollows

6) Buying on selling Property - When it is nequined to buy on to sell a property, its valuation is mequined.

G? Taxation - To assesses the tax of a priopenty its valuation is required. Taxes may be Muncipal Tax, Wealth Tax, Prioperty Tax, etc. and all the taxes and tixed on the valuation of the prioperty. the

(2) Rent tixation . In order to determine the ment of a property, valuation is nequined. Rent is usually typed on certain percentage of the amount of voluation (or to lot of the valuation).

(r) security of loans on Montgage. When loans are taken against the security

of the property, its valuation is required. () compulsority acquisition: whenever a property is acquired by Iaw compunsation is paid to the owner. To determine the amount of compensation valuation of the property is nequined

(i) Valuation of a property is also required but Insurance, Betterment changes, specificatione , et.

Cost is the amount incurred in producing and maintaining the product. Value is the utility of a good on service born a customen. By valuation the present value of a phopenty is defined. The present value of property may be decided by its celling price on income or near 14 may betch. The value of property

depends on its structure. life, maintenance, location, bank interest etc. Cost means original cast of construction of purchase.

Schap value: Schap value is the value of dismantled materials. For a building when the libe is over at the end of its whility percied the dismonthed materials as steel, bruchestimber, etc. will betch a certain amount which is the screap value of the building. In the case of machine the schap value is the value of the melet only on the value of the dismantled parts. The schap value of a building may be about 101. of its total cost of construction. The cost of dismonthing and removal of the numbership material is deducted from the total neceipt brow the sale of the weable material toget the scrip value.

Salvage values this the value at the end of the utility period without being dicmontred A machine abten the completion of its usual span of lite on when it become unecomme may be colled and one may purchase the same born we born some other purpose the sale value of the machine is the salvage value. Il does not include the cost of

has got some positive timule, but it may also be zerio on negative. As bon example the script value of a - & C C it nucliume will be negatives as dismostlying and nervoval with by Assex value. For the pumpose of taxation, a property is accessed ton the moretery

worth. This accertained price is known excessed value.

This ascessment is done at ag annual basic, concidencing bactons such es property values and market conditions in neighborring arreas, Governmental agencies like Munipel comportation conduct this assessment borr measuring applicabile it property takes based on the monetarry value of the property.

Insuriance companies may not use these valuations bori indemnitic etc. In generical, this assessed value lends to be less than the bairs on octual manded price of the property.

Sinking bund The bund which is gradually accumulated by way of perciodic on annual deposit born the neplacement of the building on structure at the ends of its useful libe, ie terrined as sinking hund. The object is creating sinking bund is to accurate accumulate subficient money to meet the cost of construction on replacement ob the building on structurie abten its utility perciod. The sinkingtund is created by negular annual on perciodic deposite in compound interest bearing investment, which will borring the amount of neplacement at the end of the utility period is the prioperity. The sinking bund may be created by taking a sinking bund policy with an incurrance company or by depositing in bank to collect highert compound interest. The calculation of sinking bund depende on the life of the building and schap value of the building bon the cost of old materials. The cost of land is not taken into account in calculating. Sinking bund as land remains intact

The sinking bund may also be nequeried bore payment ob loan, 10 a property is owned on constructed by taking loan a sinking bund may be crieated by cetting a cum ob money annually to accumulate with compound interest in orider to repay the debt at the end ob the term obtoan. The amount thus set inside is also known as Annuity payment. The amount which will be set as ide may also be paid dinearly to lenden by way of annual instalment. The amount of annual instalment of the cinking bund may be bound out by the bottmula.  $I = \frac{1}{(1+i)^{2}-1}$ , where S = total amound of sinking bund to be accumulated, n-number of years nequired to accumulate the sinking bund - rate of interest in decimal (e.g. 5%= 0.05), and I=Dannual instalment requeired

Ex.1 A pumping set with a motor has been installed in a building at a cost of Re. 2,500.00. Assuming the life of the pump as 15 years, work out the amount of annual installment is suming the life of the pump as 15 years, work out the amount of annual installment of Sinking bund required to be deposited to accumulate the whole amount of 1: compound interest.

2500×0.04 = 2500×0.05 = Fe, 125 The annual sinking bund I = \_\_\_\_\_\_ (+1)-1 The owner is to deposet Ro. 125/- annually in gy compound intervet carenying investment ton 15 years to accumulate Rs. 2, Soof

Ex.n An old building has been punchased by a penson at a cost of Rs. 30,000/- excluding the cost of Rs. 30,000/- excluding the cost of the land Calculate the amount of annual sinking bund at 41. interest assumin the tuture life of the building as 20 years and the screep value of the building as 10%. of the cost of entropy the cost of purichase. The total amount of sinking bund to be accumulated at the end of 30 years,

S= 3000× 90 = R. 27,000.00 27000 ×0,04 Annual instalment of sinking tund. I: (170,04) -1 1-11-11-1

Annual instalment tonsinking bund requeries bon 20 years - Re. 907.20 reciation: - Depression is the Depreciation - Depreciation is the gradual exhaustion of the metulness of a property This may be debined as the decrease on loss in the value of a property due to structured deterisonation use, like wear and lear, decay and obsolescene. The value of a building on structure will be gradually reduced due to its we, like, wear and rear etc. and a centain pencentage of the total cost may be allowed as depreciation to determine its pricient value. Usually a % on depreciation per annum is allowed. The general annual decrease in the value of a property is known as Annual depreciation. Usually, the percentery rate of depreciation is less at the beginning and gradically increase during inter The amount ob depreciation being known the percentage value ob a proporto yeans.

can be calculated abten deducting the total amount ob depreciation brom the origina

Method of calculating depreciation - The various methods of calculating depreciation outre as follows: -

y striaight line method- 2) Constant percentage method (6) sinking tund method 4) Quantity survey method

In all these methods, it is necessary to decide the economic on ebbective like of the priopenty.

(3) stria- ght line method: In this method die assumed that the property loser its value by the same amount every year. A tixed amount of the original cost is deducted

eveny year, so that at the end of the utility perciod only the scrip value is 1967 Annual depreciation D = Original cost - Scrap value (-5

1.be in year where (- orciginal cost, s- scriap value, n-life of the property in years and D-annuel depreciation. The book value obsert the number il years, say N years = original cost - IXXD.

(2) Constant pencentage method on Declining belance method ..

In this method, it is assumed that the property will lose its value by a constant pracentage of its value at the beginning of every year.

Annual depreciation, D= 1-(=)", where 1, s, n and D have the same mean es abore The value of the property of the depreciated cost at the End of the trust year

= C - DC = C,

The value of the property at the end of the and years (1-DC2 and so on The volue of the property on the depricated cost at the end of the myon Scanned by CamScanner

 $= C(\frac{s}{c})mn$ 

The bottmula will bail when sto. when the natio fic very small, the depreciation bon the birst year will be considerable

(3) Sinking bund methods. In this method the depreciation of property is accured to be equal to the annual einking bund pive the interest on the bund borr thrat year. which is supposed to be invected on interrect bearing investments. Is A is the onnual striking bund and ab b, C, d, etc. represents interest on the sinking bund bord reams, and c= total onliginal cost, then subsed

At the end of	Depreciation bon the year	total depreciation	Book value	
Art yean and yean and yean Arth yean	A A+b A+c A+q	A = 2A+b = 2A+b+c+d	(-A c-(2A+b) C-(3A+b+0) c-(1A+b+c+d).	

(a) Quantity survey method, in this method the property is studied in defail and toss in value due to libe, weat and tean, decay, obsolescene, etc. worked out. Fach and every depic baced on some logical ground without any bixed percentage of the cost of the property. Only experienced valuer can work the amount of depreciation and present volue it or property by this method.

Obsolescene: The value of property on structures become less by its becoming out it date in style in structure in decign, etc. and this is termed as obsolescence. An old dated building with makeive walls, annangemente ob norme not suited in present days and borr building with makeive walls, annangemente ob norme not suited in present days and borr similar reasons, becomes obsolete even if it is maintained in a very good condition and its value becomes less due to obsolescence. The obsoleccene may be due to the meacons such as progress in acts, change in tachions, changes in planning ideas, new inventions, improvements in decign technique, etc. A machine of old design may become obsolete, though it may be in good running condition and its value will be less. Thus, though the property is phycically sound, it may become bunctionally inordequate and its economical and its phycically sound, it may become bunctionally inordequate and ite économical returin Becomes leu



Administrictive set up and hieranchy of Engineering Alepandment in dibberrood level.

Obtice 16 the Engineen-in-chieb (civil)!-

This is the head of department obtice and functioning under Government of Odisha, Words Department. There are ten cincle obbicen (seven cevil, one p.H., one electrical and one mechanical) bunctioning under this Organization. There are 36 civil Divisione 2 61. P.H. Divicion, 4 Generical Fledicical Divicione and 9 Mechanical Divicion are tunctioning under the above circle othices, sub-Divisional othicere and section officers arre also Hunchoning under the above Divisional othing.

The Engineer-in-chief (civil) is the head of the Organization. Three chief Engineens decignated as chief Engineer, (DPIE Roads), chief Engineer, Building and chief Engineen, World Bank ane bunchioning under the oblice.

Decign planning and Invectigation & Roade

The Design and planning activity in the organization is provided through & separate Design, planning and Intestigation Wingin the odisho works Department. Its Head the chief Engineen, Design planning and lowestigation and Rood (CE(OPI = R) has a neporting responsibility to the EIC- cum-secretary. Buildings

In addition to nesponsibilities bon noads, odicha wonke department has the task of supervising the construction and maintenance of public buildings on behalf ob a wide many ob state Grovernment Organizations. For this pumpose the origonization structure of odicha worke department includes a specific wing okycled to this activity. If is headed by a chief Engineen Buildings (CFCB)) reportion to the EIC cum secretary. World Bank Project 10.3. R.P.) is a world Bank funded Project implemented

Odisha ctate Road Project (D.S. R.P.) is a world Bank funded Project implemented by Works Department (OWD) of GOO. The prioject Development objective (PDD) is to remove thansport bottlenecks in fargeted thansport contrident for gricater investment and economic and social development activities in the states of edishe. The project Monagement Unit(PMU), headed by chief Engineen (WBP) is located at Nimman South,

Unit. 5, Bhubaneswan

Responsibility ton new construction and maintenance works on the National Highway is under the control of the chief engineer national highways National Highwaya: (CE NH). The CE (HH) reports to MOST for works carried out on the National

Highway network Inspecting and Quality control activity is under the control of the Research Development and Quality Priomotion

chief Engineen Research Development and Quality Promotion (CE (RD) ap). If was established as a Research Laboratory in 1965 to cuter to the need ton testing of materials involved in read and building construction. This wing's tunctions expanded in 1982 to include a research development and quality promotion cell

Odisha Bridge Construction Comportion Odishe Bruidges construction componiation Limited (OBECC) was incompose

Odiene on 1982 constitution of a Govt. Company. It is a Giovennment in ol. 01.1983 under Companies Act, 1986 as a Govt. Company. It is a Giovennment Company sponsoried by odisha date Giovernment within the meaning of section 617 of the companies Act. since its meetion, it is working as a Govt. of odisha 617 of the companies Act. since its meetion is governed by Managing Director understaking organisation. The componated by the Govt. under guidelines on behalt of Board of Director nomenated by the Govt. under guidelines set by Memorandum of Association and articles of Association along with work nules mentioned therein. nules mentioned therein,

obbice of the chief Anchilect:

The obtice of the chief Anchitect is working as an independent Head of Department under the administrative control of North's Department and locks after the anchitecturial works matters of the state of odisha. Besides the above, the said obtice also prepares anchitecturial project drawing for work. Department and also buil other Department. This wing is headed by EC (Architect)

## state frocumement Coll

When the objective ob superivicion of tell real out of e-procuriement in the bour Engineering Departments of the date, Government have constituted the " chase procurrement cell under the administriative control of Dooks department with ta ( Coovel), odisha as the chief procurrement obliers unde works Department or its sach dl. 06.05. 2020 This wing is headed by chief Engineer curs chief Manner (lech) of the state Productement Cell, Govi. at odishe.

Duties responsebulity of chief engineer

-> Communicating the goale of the company to all engineers and probescional

- -> Superivicing every phace of the project brion start to completion
- -> Calculating costs, material, laborr, and time nequined borr each project.
- -> Apprioring decigar and budgets
- -> Delegating tasks to engineering teams
- -> Superivicing state triaining as well as equipment installation
- -> Performing quality control checke on all cyclems and producte
- -> Quickly recolving disputes between stabb
- -> Acknowledging on newanding good work. -> Analyzing data and drabting reports for neview.
- Duties and responsibility of the Junion Engineers

-> To keep detail history of all reads, culveres brudger and building which brong to his juties diction alongwith you obrided, conditions of monds, bridges, culvents &

> To maintain a negister with the work which has executed over the reads, bridges, culturates and building priemfices on any other structure with nelevard data like, Moura Map, Right of way for moad structure, Read building, thees, schemes as well as technical detaile ob the asset, as built drawings, nature bany work executed over the asset on its portion, date ob completion of the work, and date executed over the asset on its portion, date ob completion of the work, and date of detect heability period CDLP accounting to the contract box said work, condition of the asset during defect liability period. Name ob agency with his contract reference. This regreter will be noted wise/building wise. He is to update asset repetence of regular basic keeping all relevant downed linked with the asset in register on negular basis keeping all relevant drawinge linked with the asset in

sate custody. By To inspect eveny noad/bridge/culvent/building on periodic basis. He chould maintain a negister to keep necond as per his inspection and obsenvation. For road stretches this inspector will be biweekly basis during monsoon percod. 16 he observes any innegularities are and other identified

-> To watch whether any intoward matter including encroachment are going on the reads or desiding premised of he observes at, he should take suitable steps towards -1 and informat to his higher Authority.

> To prepare all the preliminary & detailed estimates bor original worke period-cal maintenance, addition and alterration as well as moderinization > au directed by his higher authorities, inclusive & scheduled & Non schedule zteme with phopen analysis obrates, nough graving, site plan by collecting engineering data and atrawings and submit these estimates to his immediate supercion authonity ton approval trom competent authority.

> To survive avid see that all works under his charge are done according to the specification drawinge, standands by down in contriact agreement tender schedule to worke and approved sampler by engineers in charge, He is expected to nemaion at site throughout in order to see that the works are executed properly in accordance with the requirements standards and approved scimples. It is the duty is the Junior Engineer to bring it ad once to the notice of immediate supercise authority and also make of note in the site order book is any work is not done by a contractor maintaining

- Mininted period, specifications, nequinement, anoungs, standarde laid down and ennoved sample including quality of materials
- To sake the level of atteas where earthwork on similar type twork is under executives and prepare volumetric calculation sheets for quantitative analysis and lead chants, etc
- To commy out test of materials like cement, steel, bitumen, metal, wood scoil, oggreget. on any other materials as directed by higher authorities and item ob worke as specified in contract agreement ob concre, maintain register obtesting obeach and every stem reparately and place to his immediate supercon outhority to make a not m the register.
- -> To annange and issue materials, T&P to contractors/works at the proper times so that there is no obstruction in the execution of work
- -> To keep Glovernment materials, TSP in his ruletody and carle maintain proper accountr of meceipte, issues and balances, amonge adequate watch and ward.
- -> Designing construction projects by studying project concept, curchitectural drawing and models.
- > Preparing engineeting design by collecting and studying reports, maps, drawinge, blueprints acrual photographic and took and soll and studying reports, maps, drawinge, blueprints, aerual photographs and tests on soil composition, termain, by duological
- chartacteristics and nelated topognaphical and geologic data. > Determining project costs by calculating labor, material, and related costs. -> Prieparcing leasebility study by analyzing engineering decign, conducting envinon
- mental impact studies, ussembling data.
- -> Prieparing engineering documente by developing constructions specifications, plans and schedules.
- -> Reactiving design and development problem.
- -> Managing budgets and project necounces
- -> Scheduling material and equipment purchases and deliveries
- -> Making sume the project complies with legal requarements, especially health and sately
- -> Continuing adherience to construction specifications and sobety standards by monitoring project progress, inspecting construction sete, vereitying calculation and placements
- -> fultilling project requirements by training and quiding operatory
- > Maintaining operations by embolicing project and operational policies and procedures.
- -> providing engineercing information by encharing questions and nequeste.