UNIT I
ESTIMATE OF BUILDINGS

Introduction to estimation- Necessity of Estimation- Units and Measurents-Types of Estimates-Methods of Estimation-Load bearing and framed structures Calculation of quantities of brick work, RCC, PCC, Plastering, white washing, colour washing and painting / varnishing for shops, rooms, residential building with flat and pitched roof – Various types of arches – Calculation of brick work and RCC works in arches – Estimate of joineries for panelled and glazed doors, windows, ventilators, handrails etc.- Estimation of Steel for RCC works.

General

Estimating is the technique of calculating or computing the variousquantities and the expected Expenditure to be incurred on a particular work orproject. In case the funds available are less than the estimated cost the work isdone in part or by reducing it or specifications are altered, the following requirementare necessary for preparing an estimate.

Drawings like plan, elevation and sections of importantpoints.
Detailed specifications about workmanship& properties of materialsetc.
Standard schedule of rates of the currentyear.

UNITS OF MEASUREMENTS

The units of measurements are mainly categorized for their nature, shape and size and for making payments to the contractor and also. The principle of units of measurements normally consists the following:

Single units work like sanitary fittings,Electrical points, electrical appliences, etc., is expressed innumbers.

Works consists linear measurements involve length like cornice, fencing, hand rail, pipe length with details,bands of specified width and skirting etc., are expressed in running meters (RM)

Works consists areal surface measurements involve area like plastering, white washing, partitions of specified thickness, glass of specified thickness, flooring upto the thickness of 40mm, Tiles flooring, wall tile finishing,painting of doors and windows, A.C Sheet roofing, Weathering tiles,Doors and windows shutter with required specifications, Half brick work, Honey comb Brick work, Brick on edge work etc., are expressed in square meters (m2)

Works consists cubical contents which involve volume like earth work, Earth fill,cement concrete, Masonry etc are expressed in Cubic metres.

Steel for RCC works is expressed in Killogram, Killonewton or tonne.

RULES FOR MEASUREMENT

The rules for measurement of each item are invariably described in IS- 1200.
However some of the general rules are listed below.

Measurement shall be made for finished item of work and description of each item shall include materials, transport, labor, fabrication tools and plant and all types of overheads for finishing the work in required shape, size and specification.

In booking, the order shall be in sequence of length, breadth and height or depth or thickness

All works shall be measured subject to the following tolerances.

linear measurement shall be measured to the nearest 0.01m.

Areas shall be measured to the nearest 0.01 sq.m

Cubic contents shall be worked-out to the nearest 0.01 cum and Wood for door and window frames to the accuracy of 0.0001 mt.

Killogram to the accuracy of 0.01

Same type of work under different conditions and nature shall be measured separately under separate items.

The bill of quantities shall fully describe the materials, proportions, workmanships and accurately represent the work to be executed.

In case of masonry (stone or brick) or structural concrete, the categories shall be measured separately and the heights shall be described:

From foundation to plinth level

From plinth level to first floor level

From Fist floor to second floor level and so on.

REQUIREMENTS OF ESTIMATION AND COSTING

Estimate gives an idea of the cost of the work and hence its feasibility can be determined i.e. whether the project could be taken up with in the funds available or not.

Estimate gives an idea of time required for the completion of the work.

Estimate is required to invite the tenders and Quotations and to arrange contract.

Estimate is also required to control the expenditure during the execution of work.

Estimate decides whether the proposed plan matches the funds available or not.

1.3.1.TYPES OF ESTIMATES

Prilimanry Estimate

Detailed estimate

Abstract

Revised Estimate

Prilimanary Estimate: The estimate is a rough estimate which is nornmally be estimated on approximate square feet rate. In this estimate the specifications and Area are only for the temparary purpose. Some times the cost may differ upto 50%.

Detailed Estimate: The estimate which is in detail be provided with specifcations of material, method of duing the work, Details measurements and drawings. The quantities of the item ofthe works may vary upto 10%

Abstract: The estimate which includes only the the total quantities of the item of works, Rates either as per PWD schedule or market values and total cost of the project

Revised Estimate: The revised estimate is the estimate which includes revised quantities or specifications and Rates.

 The conditions for the preparation of Revised estimates are

 1. When the area or measurements of the approved plan changes

 2.When the specification of materialof method of construction changes

 3.When the rates of the material, labour changes over and above 10%

 4. When the location of the work changes

STEPS OR PROCEDURE OF ESTIMATION

 Estimating involves the following operations

  Preparing detailed Estimate.

  Calculating the rate of each unit of work

  Preparing abstract of estimate

REQUIR4MENTS TO PREPARE AN ESTIMATE

 Drawings i.e. plans, elevations, sections etc. with complete measurements

 Detailed Specifications if possible with brand name

 Scheduled Rates or Market rates

DRAWINGS

 If the drawings are not clear and without complete dimensions the preparation of estimation become very difficult. So, it is very essential before preparing an estimate

SPECIFICATIONS

 General Specifications: This gives the nature, quality, class and work and materials in general terms to be used in various parts of wok. It helps no form a general idea of building.

 Detailed Specifications: These gives the detailed description of the various items of work laying down the Quantities and qualities of materials, their proportions, the method of preparation workmanship and execution of work.

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RATES

For preparing the estimate the unit rates of each item of work are required as given below
The rates of various materials to be used in the construction.
The cost of transport materials.
The wages of labor, skilled or unskilled of masons, carpenters, Amador, etc.,

LUMPSUM

While preparing an estimate, it is not possible to work out in detail in case of petty items. Items other than civil engineering such items are called lump sum items or simply L.S.Items.
The following are some of L.S. Items in the estimate.

Water supply and sanitary arrangements.
Electrical installations like meter, motor, etc.,
Architectural features.
Contingencies and unforeseen items.
In general, certain percentage on the cost of estimation is allotted for the above L.S.Items Even if sub estimates prepared or at the end of execution of work, the actual cost should not exceed the L.S.amounts provided in the main estimate.

WORK CHARGED ESTABLISHMENT:

During the construction of a project considerable number of skilled supervisors, work assistance, watch men etc., are employed on temporary basis. The salaries of these persons are drawn from the L.S. amount allotted towards the work charged establishment or in the category of contigencies

That is, establishment which is charged directly to work. An L.S.amount of 1½ to 2% of the estimated cost is provided towards the work charged establishment.

METHODS OF ESTIMATION

The quantities like earth work, foundation concrete, brickwork in plinth and super structure etc., can be workout by any of following two methods:
Long wall - short wall method
 Centre line method.
Partly centre line and short wall method.

LONG WALL-SHORT WALL METHOD

In this method, the wall along the length of room is considered to be longwall while the wall perpendicular to long wall is said to be short wall. To get the length of long wall or short wall, calculate first the centre line lengths of individual walls. Then the length of long wall, (outside dimension) may be calculated after adding half breadth at each end to its centre line length. Thus the length of short wall Measured into in and may be found by deducting half breadth from its centre line length at each end. The length of long wall usually decreases from earth work tobrick work in super structure while the short wall increases. These lengths are multiplied by breadth and depth to get quantities.

CENTRE LINE METHOD

This method is suitable for walls of similar cross sections. Here the totalcentre line length is multiplied by breadth and depth of respective item to get thetotal quantity at a time. When cross walls or partitions or verandah walls joinwith main all, the centre line length gets reduced by half of breadth for eachjunction. Such junction or joints are studied carefully while calculating total centreline length. The estimates prepared by this method are most accurate and quick.

PARTLY CENTRE LINE AND PARTLY CROSS WALL METHOD

This method is adopted when external (i.e., around the building) wall is of one thickness and the interior walls having different thicknesses. In such cases,centre line method is applied to external walls and long wall-short wall method isused to interiorl walls. This method suits for different thicknesses walls and differentlevel of foundations. This method is a popular method in practice.

DETAILED ESTIMATE

The preparation of detailed estimate consists of working out quantities of various items of work and then determines the cost of each item. This is prepared in two stages.

I) DETAILS OF MEASUREMENTS AND CALCULATION OF QUANTITIES

The complete work is divided into various items of work such as earth work, concreting, brick work, R.C.C. Plastering etc., The details of measurements are taken from drawings and entered in respective columns of prescribed preformed. The quantities are calculated by multiplying the values that are in numbers column to Depth column as shown below:

Details of measurements form

Item No	Details of work	No	Measurements			Quantity	Unit	
			Length -L	Breadth-B	Height-H(D)			Remarks
1	2	3	4	5	6	7	8	9

Abstract of Estimated Cost :

The cost of each item of work is worked out from the quantities that already

computed in the details measurement form at workable rate. But the total cost is worked out in the prescribed form is known as abstract of estimated form. 4%of estimated Cost is allowed for Petty Supervision, contingencies and Unforeseen items.

Item No	Details of work	Quantity	Unit	Rate	Amount	Remarks

DATA

The process of working out the cost or rate per unit of each item is called as Data. In preparation of Data, the rates of materials and labor are obtained from current standard scheduled of rates and while the quantities of materials and labor required for one unit of item are taken from Standard Data Book

FIXING OF RATE PER UNIT OF AN ITEM
The rate per unit of an item includes the following:

Quantity of materials & cost:
The requirement of materials is taken strictly in accordance with standard data book(S.D.B). The cost of these includes first cost,freight,insurance and transportation charges.

Cost of labour:
The exact number of labourers required for unit of work and the multiplied by the wages/ day to get of labour for unit item work.

Cost of equipment (T&P):
Some works need special type of equipment, tools and plant. In such case, an amount

of 1 to 2% of estimated cost is provided.

Overhead charges:

To meet expenses of office rent, depreciation of equipment salaries of staff postage, lighting an amount of 4% of estimate cost is allocated.

METHODS OF PREPARATION OF APPROXIMATE ESTIMATE

Preliminary or approximate estimate is required for studies of various aspects of work of project and for its administrative approval. It can decide, in case of commercial projects, whether the net income earned justifies the amount invested or not. The approximate estimate is prepared from the practical knowledge and cost of similar works. The estimate is accompanied by a report duly explaining necessity and utility of the project and with a site or layout plan. A percentage 5 to 10% is allowed for contingencies. The following are the methods used for preparation of approximate estimates.

Plinth area method
Cubical contents methods
Unit base method.

Plinth area method

The cost of construction is determined by multiplying plinth area with plinth area rate. The area is obtained by multiplying length and breadth (outer dimensions of building). In fixing the plinth area rate, careful observation and necessary enquiries are made in respect of quality and quantity aspect of materials and labour, type of foundation, height of building, roofwood work, fixtures, number of storey's etc., As per IS 3861-1966, the following areas include while calculating the plinth area of building

Types of Estimates

Area of walls at floor level.
Internal shafts of sanitary installations not exceeding 2.0m2, lifts, air-conditioning ducts etc.,
Area of barsati at terrace level: Barsati means any covered space open on one side constructed on one side constructed on terraced roof which is used as shelter during rainy season.
Porches of non cantilever type.
Areas which are not to include are

Area of lofts.
Unenclosed balconies upto 1.80mt
Architectural bands, cornices etc.,
Domes, towers projecting above terrace level.
Box louvers and vertical sun breakers.

Cubical Contents Method

This method is generally used for multi-storeyed buildings. It is more accurate that the other two methods viz., plinth area method and unit base method. The cost of a structure is calculated approximately as the total cubical contents (Volume of buildings) multiplied by Local Cubic Rate. The volume of building is obtained by Length x breadth x depth or height. The length and breadth are measured out to out of walls excluding the plinth off set. The cost of string course, cornice, corbelling etc., is neglected. The cost of building= volume of buildings x rate/ unit volume.

Example 1 .1: Prepare an approximate estimate of building project with total plinth area of all building is 80 sqm. and from following data.

       Plinth area rate Rs. 40000 per sqm

       Cost of water supply @7½%of cost ofbuilding.

       Cost of Sanitary andElectrical installations each @ 7½% of costofbuilding.

       Cost of architectural features @1% of buildingcost.

       Cost of roads and lawns @5% of building cost.

       Cost of P.S. and contingencies @4% of building cost.

       Determine the total cost of building project.

Solution:

Data given:

       Plinth area = 80m2

       Plinth area rate = Rs. 40000 per Sq.m

Cost of building = 80 x 40000 =	Rs. 32,00,000.00
Add the cost of water supply=7.5X3200000/100 =	+ Rs. 2,40,000.00
Add Cost of Sanitary& ElectricalInstallations=15x3200000/100=	+ Rs. 4,80,000.00
Add Architectural features= 1X3200000/100 =	+ Rs. 32,000.00
Add Cost of Roads and lawns=5X3200000/100=	+ Rs. 1,60,000.00
Add cost of P.S. & Contingencies=4X3200000/100=	+ Rs. 1,28,000.00
Total cost of the building=	Rs .42,40,000.00
Add Supervision charges 8%= 8X4240000/100	Rs. 3,39,200.00
Grand Total	**Rs.45,79,200.00**

Example 1.2 :Prepare the rough estimate for a proposed commercial complexfor a municipal corporation for the following data.

     Plinth Area = 500m2/floor Ht of each storey = 3.5m No. of storey's = G+2

     Cubical content rate = Rs. 1000/m3

    Provided for a following as a percentage of structured cost

    water supply & Sanitary arrangement-8%

     Electrification -6%

     Fluctuation of rates - 5%

     Contractors profit - 10%

     Petty supervision & contingencies - 3%

Sol :

Cubical content = No. of storey's (Plinth Area x height of each storey)

          = 3(500x3.5) = 5250m3

 Structural cost = Cubical content x cubical content rate= 5250 x 1000 = 52.5 Lakhs

Water supply installations=52.5X8/100		= 4.2 Lakhs
Electrification6%	=52.5X6/100	= 3.15 Lakhs
Fluctuation of rates	=52.5X5/100	= 2.625 lakhs
	Total	9.975 lakhs
Structural cost		=52.5 lakhs
Total cost		=62.475 lakhs
P S& contingencies =62.475X3/100=		=1.875 Lakhs
Contractor profit=62.475X10/100=		= 6.247 Lakhs
	Total cost =	70.596 lakhs

Unit Base Method

Example 1.3: Prepare an approximate estimate or rough cost estimate of ahospital building for 50 beds. The cost of construction altogether for each bed isRs. 60,000/ -. Determine the total cost of hospital building.

Solution:

    No. of beds = 50

    Cost of construction = Rs. 60,000/-

    Total Cost of Hospital building = 50x 60,000= **Rs. 30,00,000/-**

Example 1.4: To prepare the rough cost estimate of a hostel building whichaccommodate 150 students. The cost of construction including all provisions isRs. 15,000/- per student. Determine total cost of building.

Solution :

No.of students= 150
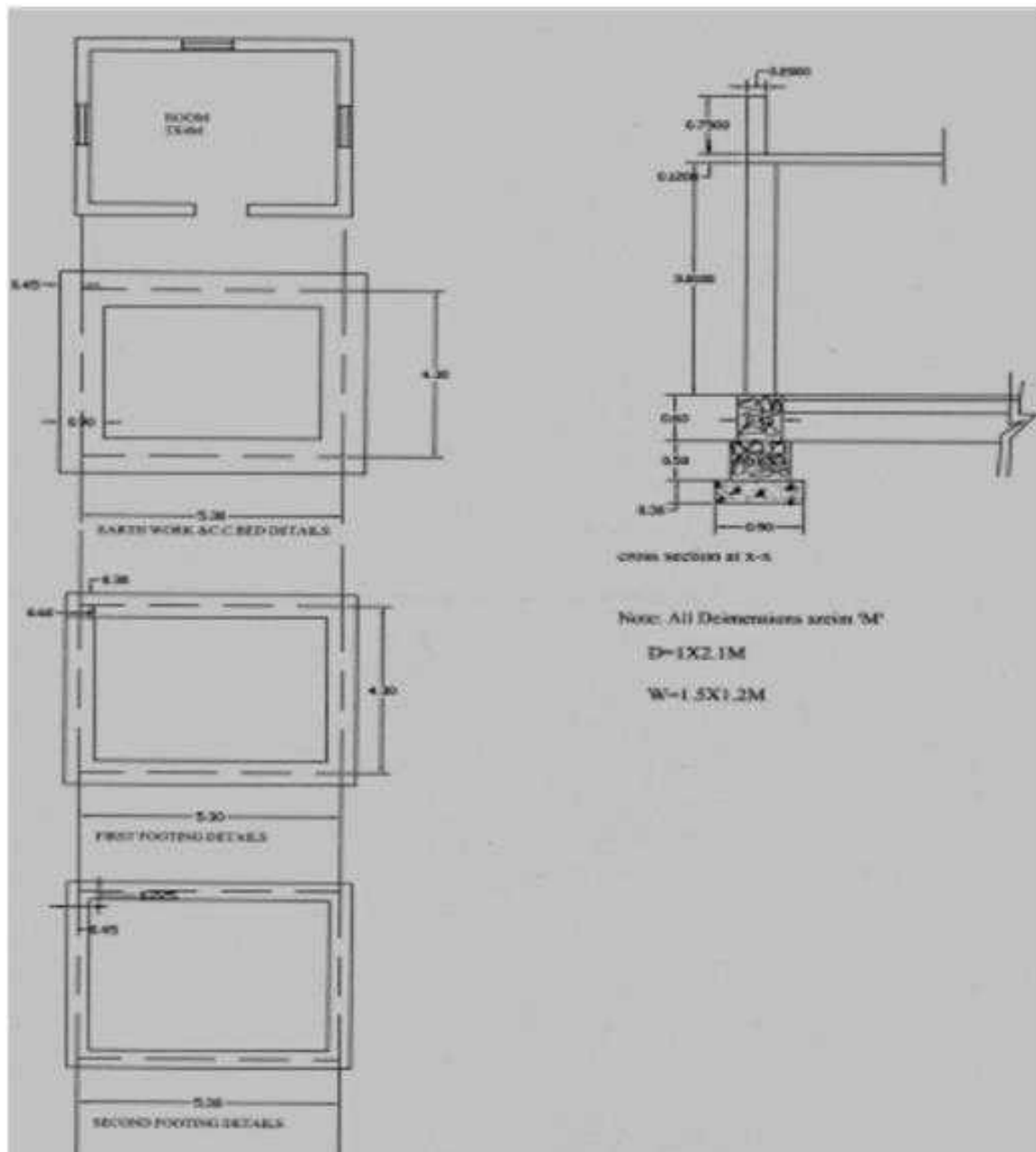
Cost of construction including all L.S. provisions = Rs. 15,000/- Total Cost of hostel building =150 x 15000 = Rs. 22,50,000/- (Rupees twenty two lakhs, fifty thousand only)
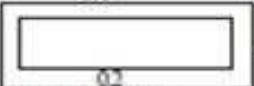
Example 1 . 5 : From the given figure below calculate the detailed   and abstract estimate for

the single roomed building (Load bearing type structure) by
long wall & short wall method

Centre Line Method

a) Long wall - Short Method

S.No	Particulars of Items	No.	L	B	H	Q	Explanation
1.	Earth Work excavation for foundation						
	a) Long walls	2	6.2	0.9	1.4	15.264	L=5.3+.45+.45=6.2
							D=0.3+0.5+0.6=1.4
	b) Short walls	2	3.4	0.9	1.4	8.568	L=4.3-0.45-0.45=3.4
						Total 24.192	m³
2.	C.C.(1:4:8) bed for foundation						
	a) Long walls	2	6.2	0.9	0.3	3.348	
	b) Short walls	2	3.4	0.9	0.3	1.836	
						Total 5.184	m³
3.	R.R.Masonry in CM (1:6) for						
	a) Footings						
	i) Long walls	2	5.9	0.6	0.5	3.54	L=5.3+0.3+0.3=5.9
	ii) Short walls	2	3.7	0.6	0.5	2.22	L=4.3-0.3-0.3=3.7
						Total 5.76	m³
	b) Basement						
	i) Long walls	2	5.75	0.45	0.6	3.105	L=5.3+0.225+0.225=5.75
	ii) Short walls	2	3.85	0.45	0.6	2.079	L=4.3-0.225-0.225=3.85
						Total 5.184	m³
	Total R.R. Masonry for footings and Basement = 5.76+5.184 = 10.94 m³						
4.	Brick masonary with CM (1:6) for super structure						
	a) Long Walls	2	5.6	0.30	3.00	10.08	L=5.3+0.15+0.15=5.6
	b) Short walls	2	4.0	0.30	3.00	7.20	L=4.3-0.15-0.15=4.0
	c) for parapet wall						
	5.6						
	[ ] 4.6						
	0.2						
	a) Long Walls	2	5.6	0.2	0.75	1.68	
	b) Short walls	2	4.4	0.2	0.75	1.32	
						Total 20.28	m³

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S.No.	Particulars of Items	No.	L	B	H	Q	Explanation
	Deductions for openings						
	a)Doors	1	1.0	0.3	2.1	0.63	
	b)Windows	3	1.5	0.3	1.2	1.62	
					Total	(-)2.25	m³
	Net Brick Masonry	= 20.28 - 2.25 =				18.03m³	
5.	R.C.C. (1:2:4) for						
	a)Roof slab	1	5.6	4.6	0.12	3.090	
	b) Lintels over						
	i) Doors	1	1.2	0.3	0.15	0.054	
	ii)Windows	3	1.5	0.3	0.15	0.202	
	c)Beams						
	i)Long beams	2	5.6	0.3	0.3	1.008	
	ii) short beams	2	4.0	0.3	0.3	0.720	
					Total	5.074	m³
6.	Sandfilling for basement	1	4.85	3.85	0.48	8.96	L=5.0-0.075-0.075=4.85
7	C.C.(1:4:8) for flooring	1	4.85	3.85	0.1	1.86	B=4.0-0.075-0.075=3.85
8	Flooring with Mosaic tiles	1	5.0	4.0	--	20.0	m²
9	Plastering with CM (1:6)for super structure Inside						
	For walls	1	18.0	--	3.0	54.0	L=2(5.0+4.0)=18.0
	Out side						
	For walls	1	20.4	--	3.87	61.2	L=2(5.6+4.6)=20.4
	Basement outside	1	21.6	--	0.6	12.96	H=3.0+0.12+0.75=3.87
	Parapet wall						(upto parapet wall)
	a) Inside	1	18.8	--	0.75	14.1	
	b) top	1	19.6	0.2	---	3.92	
	Deductions for openings				Total	146.18	m²
	Doors	1x2	1.0	--	2.1	4.2	
	Windows	3x2	1.5	--	1.2	10.8	
						15.0	m²
	Net Plastering	= 146.18 - 15.0				= 131.18	m²

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S.No.	Particulars of Items	No.	L	B	H	Q	Explanation
10	Plastering for Ceiling with CM(1:5)	1	5.0	4.0	--	20.0	m²
11	White Washing with two coats with Janatha cement						
	Same as quantity of plastering for walls and ceiling					151.18	(=131.18+20=151.18)
12.	Colour washing with two coats						
	Same as quantity of plastering for walls and ceiling					151.18	(=131.18+20)151.18)
13	Supply & Fixing of best country wood for						
	a) Doors	1				1 No.	
	b) Windows	3				3No.	
14	Painting with ready mixed synthetic enamil paits with two coats over primary coat for new wood for						
	a) Doors	2¼x1	1.0	---	2.1	4.725	
	b) Windows	2¼x3	1.5	---	1.2	12.15	
					Total	16.875	m²
15	Petty supervision and contingencies at 4% and rounding off						

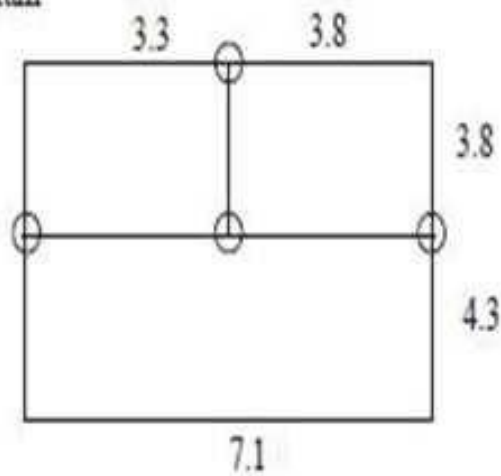## Detail & Abstract Estimates of Buildings

b) Centre Line Method

S.No.	Particulars of Items	No.	L	B	H	Q	Explanation
1.	Earth Work exevation for foundation 53 43	1	19.2	0.9	1.4	24.192	m³ L=2(5.3+4.3)=19.2
2.	C.C.(1:4:8) bed for foundation	1	19.2	0.9	0.3	5.184	m³
3.	R.R.Masonry in CM (1:6) for						
	a) Footings	1	19.2	0.6	0.5	5.76	
	b) Basement	1	19.2	0.45	0.6	5.184	
					Total	10.944	
4.	Brick masonry with CM(1:6) for super structure	1	19.2	0.3	3.0	17.28	m³
	For parapet wall	1	20.0	0.2	0.75	3.00	
	Deductions for openings						
	a) Doors	1	1.0	0.3	2.1	0.63	
	b) Windows	3	1.5	0.3	1.2	1.62	
					Total	(-)2.25	m³
	Net Brick Masonry =		17.28 +3.0-2.25 =				18.03	m³
5.	R.C.C. (1:2:4) for						
	a) roof slab	1	5.6	4.6	0.12	3.090	
	b) Lintels over						
	i) Doors	1	1.2	0.3	0.15	0.054	
	ii) Windows	3	1.5	0.3	0.15	0.202	
	c) beams	1	19.2	1.3	0.3	1.728	
					Total	5.074	m³
6.	Sandfilling for basement	1	4.85	3.85	0.48	8.96	L=5.0-0.075-0.075=4.85
7	C.C.(1:4:8) for flooring	1	4.85	3.85	0.1	1.86	B=4.0-0.075-0.075=3.85

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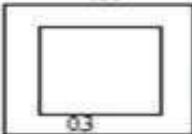
8.	flooring with Mosaic tiles	1	5.0	4.0	--	20.0	
9	**Plastering with CM (1:6)for super structure**						
	Inside						
	For walls	1	18.0	--	3.0	54.0	
	Out side						
	For walls	1	20.4	--	3.87	61.2	
	Basement outside	1	21.6	--	0.6	12.96	
	Parapet wall						
	a)Inside	1	18.8	--	0.75	14.1	
	b)top	1	19.6	0.2	---	3.92	
	Deductions for opeinings				Total	146.18	m²
	Doors	1x2	1.0	--	2.1	4.2	L=5.0-0.075-0.075=4.85
	Windows	3x2	1.5	--	1.2	10.8	B=4.0-0.075-0.075=3.85
						15.0	m²
	Net Plastering =	146.18-15		=		131.18	m²
10	Plastering for Ceiling with CM(1:5)	1	5.0	4.0	--	20.0	m²
11	White Washing with two coats with Janatha cement						
	Same as quantity of plastering for walls and ceiling					151.18	m² (131.18+20=151.18)
12.	Colour washing with two coats						
	Same as quantity of plastering for walls and ceiling					151.18	m²
13	Supply & Fixing of best country wood for						
	a)Doors	1				1 No.	
	b)Windows	3				3No.	

Example 1.6 From the given figure below calculate the details and abstractestimate for the single Storied residential buildingwith no of rooms (Load bearing type structure) by Centre line

PLAN

BUILDING

All dimensions are in mm.

REFERENCE
D - DOOR - 1000 x 2000
W - Window - 1200 x 1500

300 mm thick brick masonry in C.M. 1:6

RCC 1:2:4 lintel 20 mm thick

Parapet wall 300 mm thick

RR. masonry in C.M. 1:6

SECTION

CC 1:5:10
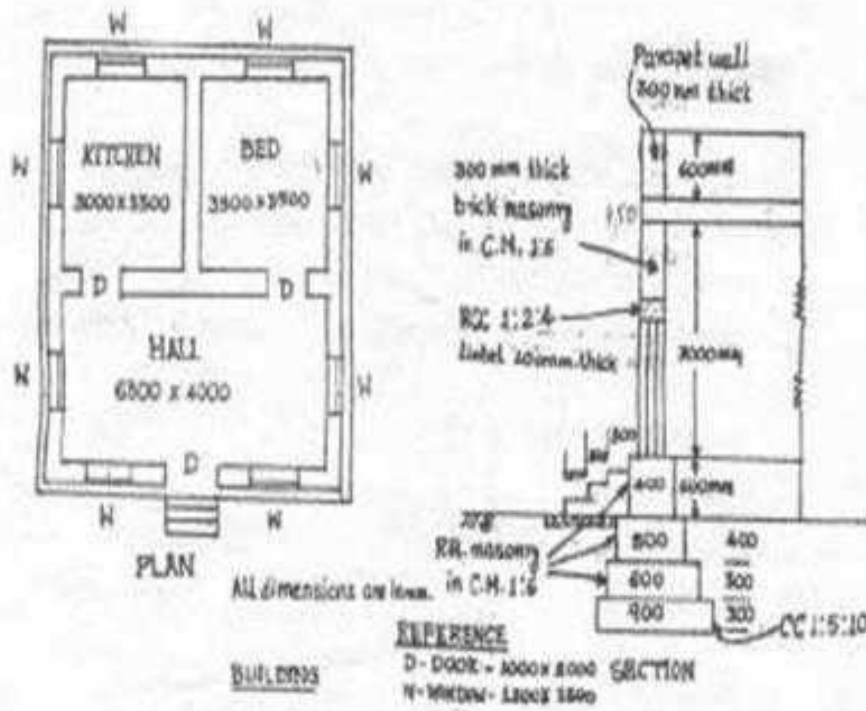
Centre line diagram

3.3   3.8

3.8

4.3

7.1

S.No.	Particulars of Items	No	L	B	H	Q	Explanation
1.	Earth work Excavation	1	39.5	0.9	1.0	35.55	41.3-4x0.9/2=39.5
2.	C.C. bed (1:5:10)	1	39.5	0.9	0.3	10.665	m³
3.	R.R. Masonary in CM 1:6						
	1st Footing	1	40.1	0.6	0.3	7.218	41.3-4x0.6/2=40.1
	IInd Footing	1	40.3	0.5	0.4	8.06	41.3-4x0.5/2=40.3
	Basement	1	40.5	0.4	0.6	9.72	41.3-4x0.4/2=40.5
					Total	25.00	m³
4.	Damp proof course over basement alround the building with CC (1:2:4)	1	40.5	0.6		16.2	m²

	Deduct for Door sills	3	1.0	0.3		- 0.9	m²
	Net Quantity =16.2-0.9=15.3 sq.m					---	
5.	First class brick work in wall in						
	a) superstructure with CM1:6	1	40.7	0.3	3.0	36.63	L =41.3-4x0.3/2
	b) Parapet wall	1	30.4	0.3	0.6	5.472	L=2(7.1+8.1)
			7.1		Total	42.102	m³

7.4

8.4

03

7.1

8.1

	Deductions:						
	Doors	3	1.0	0.3	2.0	1.80	
	Windows	8	1.2	0.3	1.5	4.32	
	Lintel opening over						
	Doors	3	1.2	0.3	0.1	0.108	Asue 100mm
	Windows	8	1.4	0.3	0.1	0.336	projection on either
					Total	6.564	side
	Net Quantity of BM = 42.102-6.564 = 35.538m³						
6.	Plastering with 12mm th in CM1:5	1x2	40.1	---	3.0	240.6	L=41.3-4x0.3=40.1
	Deductions for openings						

1

S.No.	Particulars of Items	No.	L	B	H	Q	Explanation
	Doors	3x2	1.0	---	2.0	12.0	
	windows	8x2	1.2	---	1.5	28.8	
					Total	40.8	m²
	Plastering for parapet wall (sides)	1x2	30.4	---	0.6	36.48	
	Top	1	30.4	0.3	---	9.12	
					Total	45.60	m²
	Net Plastering = 240.6-40.8+45.6=245.4 m²						
7.	Flooring with 25mm th CC(1:2:4)						
	Kitchen	1	3.0	3.5	--	10.5	
	Bed	1	3.5	3.5	--	12.25	
	Hall	1	6.8	4.0	--	27.20	
	Sills of Doors	3	1.0	0.3	--	0.90	
					Total	50.85	m²
8.	Ceiling = Same as Flooring					50.85	m²
9.	white washing = Same as Plastering for walls and ceiling 245.4+50.85 = 296.25 m²						
10.	RCC(1:2:4) for						
	a) Slab	1	7.40	8.40	1.5	9.324	
	b) lintels over Doors	3	1.2	0.3	0.1	0.108	
	Windows	8	1.4	0.3	0.1	0.336	
	c) beams	1	40.7	0.3	0.3	3.663	
					Total	13.431	m³
11	Supply & Fixing of best country wood for						
	a) Doors	3				3 Nos.	
	b) Windows	8				8 Nos	
12	Painting with ready mixed synthetic enamil paints two coats over primary coat for new wood for						
	a) Doors	2½x3	1.0	--	2.0	13.50	
	b) Windows	2½x8	1.2	--	1.5	32.40	
						45.90	m²
13	2% unforeseen items						
14	4% PS& contingencies and round off						