Subject code : (15)4013

Subject: Quantity Surveying I

Version : 2015

SCHEME OF VALUATION

PART A

I.1. Contingencies indicates the incidental expenses of miscellaneous character which can't be classified under any distinct or subhead yet pertains to the work as a whole

2. a) Centre line method

b) Long wall and short wall method

3. a) Earth work excavation : $10m^3$

b)Brick work : m^3

c) Plastering : $10m^2$

d)DPC:m^2

4. It is a book in which the quantities of materials and labour required per unit of various finished items of work has been standardized

5.

Sl no	Description of particulars	Quantity	unit	Rate	Amount

(5x2)

PART B

II .1) Duties of quantity surveyor:

1.The preparation of bill of quantity: It contains reading of drawing, Taking measurements, calculation of quantities, squiring dimensions, checking them again, Abstracting billing etc.

2. Visiting the sites and asses the quantity and quality of work.

3. Comptusing the value of work done with agreement.

4. Preparation of adjustment bills, in case of deviations in drawing and specifications.

5. He may also required to give advice in arbitration OR legal cases involving court cases.

Requirements of quantity surveyor:

1. He should able to read plans and mark them on the ground.
2. He should familiar with modern construction procedure and techniques.
3. He should have through knowledge of procedure and practise of civil Engg.constructions.
4. He must have sound knowledge of building materials and construction.s

2) The methods of approximate estimate are

i)Plinth area estimate : It is calculated by finding the plinth area of the building and multiplying by the plinth area rate . The plinth area should be calculated for the covered area by taking external dimensions of the building at the floor level

ii)Cubic content estimate: It is worked out on the basis of the cubical contents of the proposed building to be constructed and then applying to it the rate per cubic meter. The cubic content rates generally provided can be deduced from the cost of similiar building constructed in the same locality, having more or less the same finishing and the same aminities.The foundation ,plinth and the parapet above roof are excluded in finding the cubical content

iii)Typical bay estimate : The method is adopted in large institutional schemes where there are large number of blocks or works of similiar types.In this method cost per bay of a typical bay of the building is calculated and this can be multiplied by the total number of bays of similiar cross section of all the building to get the estimate it is also called unit bay method

(2x3)

3) Centre line method : The sum total of centre lines of wall ,long and short having the same type of foundation and footings and then find the quantities In this method the length will remain the same for excavation in foundation , for P C C for all foundation and superstructure. This method is quick but requires special attention and considerations at the junctions, meeting point of partitions or cross wall etc. for each junction half breadth or width of the respect item is should be deducted from the total centre line for building having different types of walls, each set of walls shall have to be dealt separately .It may be noted that

at corners of building where 2 wall are meeting no subtractions or addition required (6)

4)

Item no	Description	No	Measurements			Quantity	Remark
			L	B	H		
1	Concrete in foundation	1	1.9	0.95	0.10	0.18m³	

(6)

5) Centre to centre length of inclined wall $=\sqrt{(1.95+.15)^2+(1.125+.15)^2}$

$=\sqrt{(2.1)^2+(1.275)^2}$

$=\sqrt{6.04}$ $=2.46$ m

Total centre line length of walls $= 4.8 + (2x4.15) + (2x2.46) + 2.25 = 20.27$m

Item no	Description	No	Measurements			Quantity	Remark
			L	B	H		
1	2 cm Damp proof course	1	20.27	0.40	-	8.11	
	Deduct door sill	1	1.20	0.40	-	0.48	
				Net	Total	= 7.63m²	

(6)

6) Quantity of cement concrete = 1000 x 3.70 x .08 = 296 cum

Cost per kilometre of road = 296 x 375 =Rs .111000 (6)

7) 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.

1. In booking, the order shall be in sequence of length, breadth and height or thickness.
2. 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

3. Same type of work under different conditions and nature shall be measured separately under separate items.
4. 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 (6)

PART C

UNIT 1

111) a) Revised estimate is a detailed estimate and is required to be prepared under any one of the following circumstances

i) When the technical sanction estimate exceeded or likely to exceed by more than 5%

ii) When the expenditure on a work exceeds or likely to exceed the amount of administrated sanction by more than 10%

iii) When there is a material deviation from the original proposal, even though the cost may be met from the sanctioned amount

A comparative statement should be kept along with the revised estimate

(7)

b) 1. Cost of building = cubic content x cubic rate
= 400 x 16.50 x 1500
= Rs 99,00,000/-

2. Provision for water supply, sanitation and electrical installation at each @ 5% of building cost $= \frac{99,00,000\ (3x5)}{100}$ = Rs 14,85,000/-

3. Architectural appearance at 1% $= \frac{99,00,000 \times 1}{100}$ = 99,000/-

4. Unforeseen items at 2% $= \frac{99,00,000x2}{100}$ = 1,98,000/-

5. P.S charges and contingencies 4% $= \frac{99,00,000x4}{100}$ = 396,000/-

Total = Rs 21,78,000/- (8)

IV) a)

i) Work charged establishment : During the construction of a project considerable number of skilled supervisors ,work assistance, watchman etc., are employed on temporary basis. The salaries of this persons are drawn from the amount allotted towards the work charged establishment.

ii) Sundries: A Lumpsum amount provided in the analysis of unit rate towards the petty items which can't be accounted in detail

iii) Lumpsum : In preparation of an estimate , it is not possible to workout in detail in case of minor items such items are called lumpsum item.

iv) Rates: The rates of different items used in the estimate are the current rates upto the completion of the time. They include supply of materials ,transport ,labour, etc..

(7)

b) Width of road b =10m n = 2 L = 50m RL of formation = 100
d1= 100-97 = 3 m , d2 = 3.5m , d3 = 4m , d4 = 2.5 m , d5 = 2m

A1 = (b+nd1)d1 = 48m² A2 = 59.5 m² A3 = 72 m²

A4 = 37.5 m² A5 = 28 m²

(a) Quantity of earth work by Trapezoidal formula

$$V = \frac{L}{2}[(A1 + A5) + 2(A2 + A3 + A4)]$$

$$V = \frac{50}{2}[(48 + 28) + 2(59.5 + 72 + 37.5)]$$

$$= \underline{10{,}350\ m^3}$$

(b) Quantity of earth work by Prismoidal formula

$$V = \frac{L}{3}[(A1 + A5) + 4(A2 + A4) + 2(A3)]$$

$$V = \frac{50}{3}[(48 + 28) + 4(59.5 + 37.5) + 2(72)]$$

$$= \underline{10133.33\ m^3}$$

(8)

UNIT II

V) (a)

Item no	Description	No	Measurements			Quantity	Remark
			L	B	H		
1	Earth work in excavation	1	1.90	0.95	0.15	0.27m³	

(7)

b)

Item no	Description	No	Measurements			Quantity	Remark
			L	B	H		
1	Brick work in super structure	1	20.27	0.30	3.70	22.50m³	
	Deduct –						
	Door opening	1	1.20	0.30	2.20	0.79	
	Window opening	6	1.00	0.30	1.50	2.70	
	Shelf	2	1.00	0.20	1.90	0.76	
	Lintel over door	1	1.44	0.30	0.10	0.043	
	Lintel over windows	6	1.24	0.30	0.10	0.223	
	Lintel over shelf	2	1.24	0.30	0.10	0.074	
				Total	deduction	**4.59**	
				Net	total	**17.91 m³**	

(8)

VI) a)

Item no	Description	No	Measurements			Quantity	Remark
			L	B	H		
1	R R Masonry in foundation and basement in 1:6 cement mortar						
	1st footing	1	20.27	0.70	0.20	2.84	
	2nd footing	1	20.27	0.60	0.20	2.43	
	3rd footing	1	20.27	0.50	0.20	2.03	
	Basement	1	20.27	0.40	0.60	4.86	
				Net	total	**12.16m^3**	

(7)

b)

Item no	Description	No	Measurements			Quantity	Remark
			L	B	H		
1	Brick work						
	1st step	1	1.80	0.90	0.20	0.324	
	2nd step	1	1.80	0.60	0.15	0.162	
	3rd step	1	1.80	0.30	0.15	0.081	
				Net	total	0.567m^3	

(8)

UNIT III

VII) a)

Item no	Description	No	Measurements L	B	H	Quantity	Remark
1	**2.5 cm c.c. floor**						
	Rectangular portion	1	4.5	4.00	-	18.00	
	Front half hexagonal portion	1	$\frac{4.50+2.25}{2} X 1.95$		-	6.58	
	Door sill	1	1.20	0.35	-	0.42	
			Total			24.16m²	

(7)

b)

Item no	Description	No	Measurements L	B	H	Quantity	Remark
1	Finishing 20 mm cement plastered						
	Treads	3	1.80	0.30		1.62	
	Risers	4	1.80	-	0.15	1.08	
	Ends	2	0.90	-	0.15	0.27	
		2	0.60	-	0.15	0.18	
		2	0.30	-	0.15	0.09	
					Total	3.24m²	

(8)

VIII) a) Inside dia. of well = 2.5 m

Thickness of steining = 0.3 m

Outer diameter of well = 2.5 +.3+.3 = 3.1 m

Depth = 10 m

Quantity of earthwork excavation = $\frac{\Pi}{4} d^2 X H$

$= \frac{\Pi}{4} X 3.1^2 X 10$

$= \underline{75.47 \text{ m}^3}$

(7)

(b)

Item no	Description	No	Measurements L	B	H	Quantity	Remark
1	Painting with approved enamel paint						
	Doors D	1	1.2 ×	$2.2 \times 2\frac{1}{4}$		5.94	
	Windows W	6	1 ×	1.5 × 1		9	
					Total	14.94 m²	

(8)

UNIT IV

IX a) In order to determine the rate of a particular item , the factors affecting the rate of that item are studied carefully and finally a rate is decided for that item . This process of determining rates of an item is termed as analysis of rates . or rate analysis.

The rate of a particular item of work depends on the following ,

i) Specification of work and materials , about their quality, propotion and constructional operation method
ii) Quantity of material and their cost
iii) Cost of labours and their wages
iv) Location of site of work and distance from source and conveyance charge
v) Profit (7)

b) **(8)**

Item no	Quantity	Description	Unit	Rate	Amount
1		Random Rubble Masonry 1:6 C M	m^3		
		Materials			
a	1.0m^3	Rubble	m^3	420/-	420/-
b	0.30m^3	Sand	m^3	2777/-	833.1/-
c	72kg	cement	tonne	5940/-	427.6/-
		Labour			
a	0.7	Mason	Each/day	471/-	329.7/-
b	0.35	Men	Each/day	377/-	131.95/-
c	0.7	Women	Each/day	377/-	263.90/-
		Total			2406.25/-
		10% CP			240.625/-
		Net total			2646.875/-

(X)a) The cost of each item of work is calculated in a tabular form from the quantities already computed and total cost is worked out in Abstract of estimate form . The rates of different item of work are taken as per schedule of rates or current workable rate . A percentage usually 3% of estimated cost is added to allow for contigencies and a percentage of about 2% is provided for work charged establishment . The grand total of the obtained value gives the estimated cost of the work. (6)

(b)

Item No	Description	Quantity	Rate	Unit	Amount
1	Earthwork excavation	7.07m³	350	m³	2474.5
2	R.R. Masonry for Foundation and basement	4.1m³	900	m³	3690
3	Brick work in Superstructure	12.6m³	1500	m³	18900
4	Doors and Windows	1.1m³	5000	m³	5500
5	Plastering	171m²	250	m²	42750
				Total	73314.5
6	Sanitary, electrification and water supply	15% of cost			10997.175
7	Unforeseen items	2% of cost			1466.29
				Total cost	85777.965/-

(9)