

2.3 PROCEDURE OF RATE ANALYSIS

Cost of materials at source and at site of construction.

The costs of materials are taken as delivered at site inclusive of the transport local taxes and other charges.

Purpose of Analysis of rates:

1. To work out the actual cost of per unit of the items.
2. To work out the economical use of materials and processes in completing the particular item.
3. To work out the cost of extra items which are not provided in the contract bond, but are to be done as per the directions of the department.
4. To revise the schedule of rates due to increase in the cost of material and labour or due to change in technique.

2.3.1 RATE ANALYSIS FOR ALL BUILDING WORKS,

CEMENT CONCRETE

Sum total quantity of determining the quantity of materials for 10 cu m concrete is to divide 15.2 by the sum of the numerals of the proportion of the materials which gives the quantity of cement in cu m.

Illustration. -To find the materials for 10 cu m of cement of 1:4:8 proportion.

Cement = $15.2 / 1+4+8 = 15.2 / 13 = 1.17$ cu m = Say 1.15 cu m.

Therefore, sand = $1.15 \times 4 = 4.60$ cu m and ballast = $1.15 \times 8 = 9.20$ cu m.

Materials required for different Proportion of Cement Concrete - 10 cu m.

Quantity of materials may be calculated by 15.2 as sum total and dividing by sum of the proportions.

Proportion	Ballast	Sand	Cement
1:1 ½ :3	8.40 cu m	4.20 cu m	2.80 cu m (84 bags)
1:2:4	8.80 cu m	4.40 cum	2.20 cu m (66 bags)
1:3:6	9.00 cu m	4.50 cu m	1.50 cu m (45 bags)
1:4:8	9.20 cu m	4.60 cu m	1.15cu m (34 1/2 bags)
1:5:10	9.50 cu m	4.75 cum	0.95 cu m (282 bags)
1:6:12	9.60 cum	4.80 cu m	0.80 cu m (24 bags)

1.Cement concrete 1:5:10 in foundation or Floor with Brick Ballast 40 mm (1 1/2") Thick gauge- unit 1 cu m. Take - 10 cu m.

Materials-

Brick ballast 1st class 40 mm gauge...	650.00 per cum
Sand (local)	700.00 per cu m
Cement	7650.00 per cu m

Labour-

Mistri (Head mason)	1.5 no.	350.00 per day
Mason	1.5 no.	300.00 per day
Mazdoor (Beldar)	12 nos.	220.00 per day
Boy or woman coolie	18 nos.	200.00 per day
Bhishti (including curing)	4 nos.	200.00 per day
Sundries T. and P. etc.	Lump sum	120.00 L.S.

Solution:

Particulars	Qntty or Nos	Rate		Cost
		Rs.	P.	Rs P.
Materials-				
Brick ballast 1st class 40 mm gauge...	9.50 cum	650.00 per cum		6175.00
Sand (local)	4.75 cu m	700.00 per cu m		3325.00
Cement (28 1/2 bags)	0:95 cu m	7650.00percu m		7267.50
		Total		16767.50
Labour-				
Mistri (Head mason)	1.5 no.	350.00 per day		175.00
Mason	1.5 no.	300.00 per day		450.00
Mazdoor (Beldar)	12 nos.	220.00 per day		2640.00
Boy or woman coolie	18 nos.	200.00 per day		3600.00
Bhishti (including curing)	4 nos.	200.00 per day		800.00
Sundries T. and P. etc.	Lump sum	120.00 L.S.		120.00
		Total		7785.00
Total of materials and labour				24552.50
Add 1.5% Water charges				368.00
Add 10% Contractor's profit ...				2455.25
Grand Total				27375.75
Rate per cu m - $\text{Rs.}27375.75 / 10 = \text{Rs.}2737.50$ for 10 cu m				

2.Cement concrete 1:2:4- Unit 1 cum Take - 10 cu m.

Materials-

Brick ballast 1st class 40 mm gauge...	1800.00 per cum
Sand (local)	1500.00 per cu m
Cement	7650.00 per cu m

Labour-

Mistri (Head mason)	1/3 no.	350.00 per day
Mason	2 no.	300.00 per day
Mazdoor (Beldar)	12 nos.	220.00 per day
Boy or woman coolie	20 nos.	200.00 per day
Bhishti (including curing)	6 nos.	200.00 per day
Forms etc.	Lump sum	1300.00 L.S.
Sundries T. and P. etc.	Lump sum	150.00 L.S.

Particulars	Qntty or Nos	Rate		Cost
		Rs.	P.	Rs P.
Materials-				
Brick ballast 1st class 40 mm gauge...	8.80 cum	1800.00 per cum		15840.00
Sand (coarse)	4.75 cu m	1500.00 per cu m		6600.00
Cement (66 bags)	0:95 cu m	7650.00 per cu m		16830.00
		Total		39270.00
Labour-				
Mistri (Head mason)	1/3 no.	350.00 per day		116.70
Mason	2 no.	300.00 per day		600.00
Mazdoor (Beldar)	12 nos.	220.00 per day		2640.00
Boy or woman coolie	20 nos.	200.00 per day		4000.00
Bhishti (including curing)	6 nos.	200.00 per day		1200.00
	Lump sum	1300.00 L.S.		1300.00

Forms etc. Sundries T. and P. etc.	Lump sum	150.00 L.S.	150.00
		Total	10006.70
Total of materials and labour			49276.70
Add 1.5% Water charges			739.00
Add 10% Contractor's profit ...			4927.70
Grand Total			54943.40
Rate per cu m - $\text{Rs.}54943.40 / 10 = \text{Rs.}5497.00$ for 10 cu m			

2.3.2 RATE ANALYSIS FOR ROADS

1.Bituminous painting or surface Dressing First coat – unit 1sqm. Take –100 sqm.

Particulars	Qntty or Nos	Rate		Cost
		Rs.	P.	Rs P.
Materials :-				
Stone chips (grit) 20 mm (3/4") gauge @ 1.35cu m % sq m	1.35 cu m	1800.00 per cum		2430.00
Asphalt 80/100 @ 220 kg % sq m including 2 1/2% wastage (transported to	0.22 tonne	50000.0 per cum		11000.00

road side)			
Labour :-			
Mazdoor (Beldar) for brushing and cleaning roadsurface	4nos	220.00 per day	880.00
Mazdoor (Beldar) for heating and spraying asphalt	4nos	220.00 per day	880.00
Mazdoor (Beldar) for rolling and brushing chips	½ nos	220.00 per day	110.00
Hire of Tar Boiler @ 6.00 sq m per day (about 4 km per day for 3.70 m wide road)	1/6 nos	400.00 per day	66.67
Fuel, Firewood for heating asphalt @ 4 quintalper tonne of asphalt (for coal take 2 q per toneof asphalt)	0.88 q	500.00 per q	440.00
Hire of Roller @ 600 sq m per day (including driver and fire man or cleaner and coal/diesel)	1/6 day	2000.00 per day	333.33

Sundries, T. and P., brushes, etc.	Lump sum	125.00 L.S	125.00
		Total	9265.00
Add 10% contractors profit			926.50
		Grand Total	10191.50
Rate per sq m- Rs.10191.50/100 = 102.00 for 100 sq m			

2.Bituminous painting or surface Dressing Second coat – unit 1sqm. Take –100 sqm.

Particulars	Qntty or Nos	Rate		Cost
		Rs.	P.	Rs P.
Materials :-				
Stone chips (grit) 12 mm (1/2") gauge @ 0.75cu m % sq m	0.75 cu m	1700.00 per cum		1275.00
Asphalt 80/100 @ 220 kg % sq m including 2½% wastage (transported to road side)	0.22 tonne	50000.0 per cum		11000.00
Labour :-				
Mazdoor (Beldar) for heating and cleaning roadsurface	2nos	220.00 per day		440.00
Mazdoor (Beldar) forbrushing and spraying asphalt	1 ½ nos	220.00 per day		330.00

Mazdoor (Beldar) spreading stone chips	1 ½ nos	220.00 per day	330.00
Mazdoor (Beldar) for rolling and brushing chips	½ nos	220.00 per day	110.00
Hire of Tar Boiler @ 800 sq m per day (215 m length, about 1/5 km per day for 3.70 m wide road)	1/8nos	400.00 per day	50.00
Fuel, Firewood for heating ashpalt @ 4 quintalper tonne of asphalt (for coal take 2 q per toneof asphalt)	0.48 q	500.00 per q	240.00
Hire of Roller @ 800 sq m per day (including driver and fire man or cleaner and coal/diesel)	1/8 day	2000.00 per day	250.00
Sundries, T. and P., brushes, etc.	Lump sum	100.00 L.S	100.00
		Total	14125.00
Add 10% contractors profit			1412.50
		Grand Total	15537.50
Rate per sq m- Rs.15537.50/100 = 155.00 for 100 sq m			