Estimating & Costing -1

Slide Making By : **Nur Nahar Akter Santa**
Jr .Instructor
Civil Technology
Daffodil Institute of IT,Chittagong

Chapter 5

ANALYSIS OF RATES

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

The rates of particular item of work depends on the following.

1. Specifications of works and material about their quality, proportion and constructional operation method.
2. Quantity of materials and their costs.
3. Cost of labours and their wages.
4. Location of site of work and the distances from source and conveyance charges.
5. Overhead and establishment charges
6. Profit

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 particulars item.
3. To work out the cost of extra items which are not provided in the contract

the superintendent Engineer for his circle every year and approved by the Board of Chief Engineers. These rates are incorporated in the standard schedule of rates.

Lead statement: The distance between the source of availability of material and construction site is known as "Lead " and is expected in Km. The cost of convenayce of material depends on lead.

This statement will give the total cost of materials per unit item. It includes first cost, convenayce loading, unloading stacking, charges etc.

The rate shown in the lead statement are for mettalled road and include loading and staking charges . The environment lead on the metalled roads are arrived by multiplying by a factor

a)   for metal tracks   -   lead x 1.0

b)   For cartze tracks   -   Lead x 1.1

c)   For Sandy tracks   -   lead x 1.4

Note: For $1m^3$ wet concrete $= 1.52m^3$ dry concrete approximately

SP.Wt of concrete$= 1440$ kg/m^3 (or) 1.44 t/m^3

1 bag of cement $= 50$ Kg

Example 1:- Calculate the Quantity of material for the following items.

a)   R.C.C. (1:2:4) for $20m^3$ of work

b)   R.C.C. (1:3:6) for $15m^3$ of work

a)   Quantity of cement required $= \dfrac{1}{(1+2+4)}$ x $1.52 \times 20 = 4.14m^3$ x $\dfrac{1440}{50}$

$=119.26$ bags

Quantity of Sand required $= \dfrac{2}{(1+2+4)} \times 1.52 \times 20 = 8.28m^3$

Analysis of Rates

Example 2:- Calculate the quantity of materials for the following items.

    a) C.M. (1:4) for 1m³ of work

    b) CM (1:6) for 1m³ of work

Hint: Cement will go to fill up the volds in sand. So total volume was be 4 instead of 1+4=5

a)   Quantity of Cement required $= \dfrac{1}{4} \times 1 = 0.25m^3 = 0.25 \times \dfrac{1440}{50} = 7.2$ bags

      Quantity of Sand required $= \dfrac{4}{4} \times 1 = 1m^3$

b)   Quantity of cement required $= \dfrac{1}{6} \times 1 = 0.16m^3 = 0.16 \times \dfrac{1440}{50} = 4.8$ bags

      Quantity of sand required $= \dfrac{6}{6} \times 1 = 1m^3$

Example 3:- Calculate the Quantity of Cement required in bags for the following items.

a)   B.M. in CM(1:3) for 15 cum of work using 0.2m³ of CM required for 1m³ of Brick work

b) RCC (1:2:4) for 20m³ of work

Sol : a) 1m³ of Brick work - 0.2m³ of CM(1:3)

        15 m³ of Brick work $= 15 \times 0.2 = 3m^3$

    Quantity of cement required in bags $= \dfrac{1}{3} \times 3 \times \dfrac{1440}{50} = 28.8$ bags

b) Quantity of Cement required in bags $= \dfrac{1}{7} \times 1.52 \times 20 \times \dfrac{1440}{50} = 125$ bags

nt for the following materials

t Source	Lead in KM			Conveyance Charge per km
	MT	CT	ST	
0/m³	---	5	7	Rs.5.00/m³
/m³	3	2	6	Rs.3.50/m³
35/bags	2	---	4	Rs. 4.00 per 4km/bag

of e	Lead in KM			Equalant lead in km	Conveyance Charge	Total convey-ance Charge	Total cost
	MT	CT	ST				
³	--	5	7	$5\times1.1+7\times1.4=153$	5.00/m3	$15.3\times5=76.5$	$120+76.5=196.5/m^3$
	3	2	6	$3\times1+2\times1.1+6\times1.4$ $=13.6$	3.50/m3	$13.6\times3.5=47.6$	$15+47.6=62.6/m^3$
ags	2	---	4	$2\times1+4\times1.4=7.6$	4.00per4km/bag	$\dfrac{7.6}{4.0}\times4.0=7.6$	$135+7.6=142.6/bag$

/m³

6.88/m³

Analysis of Rates

...t for the following materials

Source	Lead in KM			Conveyance Charge per km	Seinarage Charges	Cess Charges
	ST	CT	MT			
0KN(ton)	5	2	3	Rs.1.5/m³	--	---
00nos	5	--	3	Rs.30/1000Nos/Km	35	13
...³	4	2	5	Rs.9.00 / km/cum	30	12
...m³	3	2	2	Rs.6.50/Km/m³	35	15

Lead in KM		Equalant lead in km	Conveyance Charge Rs.	Total conveyance Charge Rs.	Seinerage Charge Rs.	Cess Charge Rs.	Total cost Rs.
CT	MT						
2	3	5x1.4+2x1.1+3x1=11.2	1.50	16.80	--	--	2116.8/10KN
--	3	5x1.4+3x1=10	30	300.00	35	13	1198/1000nos
2	2	1x1.4+2x1.1+2x1=5.6	9.00/m³	50.40	30	12	107.4/m³
2	2	3x1.4+2x1.1+2x1=8.4	6.5/m³	54.6	35	15	354.6/m³