

VALUATION OF BUILDINGS & STANDARD SPECIFICATIONS

Contract and Types of Contracts

Contract is defined as an agreement which can be enforced by a court of law. It comprises of a proposal from one party & its acceptance by the other party with reference to public works department. Contract is a written document for work execution (or) material supply.

Types of contract

- 1) Item rate contract (2) Percentage rate contract
- 3) Lump sum contract (4) Labour contract
- 5) Material Supply contract (6) Cost plus percentage rate contract (7) Cost plus fixed fee contract (8) Target contract.

Pre-Tender planning and Pre-construction planning

The pre-tender planning phase entails the identification of current position and needs, the resources and time planning & budgeting the project preparation including the definition of requirements and choice of methods.

Pre construction is all encompassing planning stage of construction and client all work together to develop design, schedule budgets and more. The process is highly collaborative and communicate.

Formulae

1) Capitalized Value of Building = Net Income × Year Purchase

2) Year Purchase = $\frac{100}{\text{Rate of interest}}$

3) Depreciated Value of building

$$D = P \left[\frac{100 - rd}{100} \right]^n \quad \text{where } rd = \text{rate of depreciation}$$

= 1.0 for 100 yrs.

4) Annual Sinking fund $I = \frac{Si}{(1+i)^n - 1}$

where $n = \text{no. of yrs.}$, $i = \text{compound rate of interest}$

5) Gross rent = Net rent + Outgoings.



Ques. A three-storeyed building is standing on a plot of land measuring 800 sq.m. The plinth area of each storey is 400 sq.m. The building is of R.C.C. framed structure and the future life may be taken as 70 years. The building fetches a gross rent of Rs. 1500.00 per month. Work out the capitalised value of the property on the basis of 6% net yield. For sinking fund 3% compound interest may be assumed. Cost of land may be taken as Rs. 40.00 per sq.m. Other data required may be assumed suitably.

(1)

$$\text{Given plot of land} = 800 \text{ sq.m}$$

$$\text{Plinth area of each storey} = 400 \text{ sq.m}$$

$$\therefore \text{Gross income per year} = \frac{\text{Gross rent}}{12} \times \text{no. of months} \\ = 1500 \times 12 = 18,000.00$$

Outgoing per annum assuming suitable data :-

$$\text{i) Repairs at } \frac{1}{12} \text{ of gross income i.e. } \frac{18000}{12} = 1500.00$$

$$\text{ii) Municipal tax 20% of gross income} \rightarrow 18000 \times \frac{20}{100} = 3600.00$$

$$\text{iii) Property tax 5% of gross income} \rightarrow 18000 \times \frac{5}{100} = 900.00$$

$$\text{iv) Insurance premium @ } \frac{1}{2} \text{ of G.R.} = 18000 \times \frac{0.5}{100} = 90.00$$

$$\text{v) Management charges @ 6% of G.R.} = 18000 \times \frac{6}{100} = 1080.00$$

$$\text{vi) Other Miscellaneous Charges @ 2% of G.R.} = 18000 \times \frac{2}{100} = 360.00$$

v) Sinking fund required to accumulate cost of building (which is at the rate of Rs. 150.00 per sq.m) of plinth area

$$= (400 \times 3 \times 150) = 180000.00 \text{ in } 72 \text{ years @ } 3\% \text{ interest} \rightarrow 180000 \times \frac{3}{100} = 5400$$

$$= 12930.00$$



$$\text{Net annual return} = 16000 - 12930 \Rightarrow 3068 \text{ Rs}$$

Ans
including
outgoings

Capitalised Value of building \rightarrow Net income \times Year Purchase

$$= 3068 \times \frac{100}{6}$$

$$= 51133.33 \quad (\because \text{gross rent})$$

$$\text{Cost of land} @ 4000/\text{per sq ft}$$

$$= 800 \times 40 = 32000/-$$

$$\text{Total} = \underline{\underline{116500}}$$

$$\text{Value of whole property} = \underline{\underline{1,16500/-}}$$

Q

- 2) A property fetches a annual income of Rs. 900.00 deducting all outgoings. Work out the capitalised valuation of ~~the~~ the property if the rate of interest is 6% per annum.

Sol

$$\text{Years purchase} = \frac{100}{\text{Rate of interest}} \Rightarrow \frac{100}{6} = 16.67$$

$$\text{Capitalised value} = \text{Net income} \times \text{Y.P}$$

$$= 900 \times 16.67 \Rightarrow 15003.00/-$$

- 3) A building is situated by the side of a main road of Lucknow city on a land of 500 sq.mt. The built up portion is 20m \times 15m. The building is first class type and provided with water supply, sanitary & electric fittings, and the age of the buildings is 30 years. Work out the valuation of the property.

Sol

$$\text{Plinth area of the building} = 20 \times 15 \Rightarrow 300 \text{ sq.mt}$$



Net annual return = 18000 - 12930 \Rightarrow 5070.00

Capitalised value of building \Rightarrow Net income \times Year Purchase

$$= 5070 \times \frac{100}{6}$$

$$= 84500.$$

(\because Gross rent
 $=$ Net rent +
outgoings.)

Cost of land @ 40.00/- per sq.m

$$= 800 \times 40 = 32000/-$$

$$\text{Total} = \underline{\underline{1,16500}}$$

Value of whole property = 1,16500/-

Q)

- 2) A property fetches a annual income of Rs. 900.00 deducting all outgoings. Work out the capitalised valuation of the property if the rate of interest is 6% per annum.

Sol: Year's purchase = $\frac{100}{\text{Rate of interest}} \Rightarrow \frac{100}{6} = 16.67$

Capitalised value = Net income \times Y.P

$$= 900 \times 16.67 \Rightarrow 15003.00/-$$

- 3) A building is situated by the side of a main road of Lucknow city on a land of 500 sq.m. The built up portion is 20m \times 15m. The building is first class type and provided with water supply, sanitary & electric fittings, and the age of the buildings is 30 years. Work out the valuation of the property.

Sol: Plinth area of the building = $20 \times 15 = 300 \text{ sq.m}$



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Assuming plinth area rate as Rs. 200.00 per sq.m²

including w.s & sanitary & electric fittings,

$$\therefore \text{Cost of building} = 300 \times 200 \\ \Rightarrow 60,000.00/-$$

Considering the life of the building as 100 yrs.
Reducing the rate of depreciation as building in a methodological way
the depreciated value of building. r_d = rate of depreciation

$$D = P \left[\frac{100 - r_d}{100} \right]^n \quad \text{where } P = 60,000, n = 30, r_d = 1.0 \text{ for} \\ 100 \text{ yrs.}$$

$$D = 60000 \left[\frac{100 - 1}{100} \right]^{30} \\ \Rightarrow 60,000 \times 0.739 \\ \Rightarrow 44340/-$$

② ∵ Cost of land assuming Rs. 60/- per sq.m²

$$= 500 \times 60 \Rightarrow 30000.00 ,$$

$$\therefore \text{Total valuation of property} = 30,000 + 44340 \\ \Rightarrow \underline{\underline{74340/-}}$$

* A building costing Rs. 700,000 has been constructed on a free hold land measuring 100 sq.m recently in a big city. Prevailing rate of land in the neighbourhood is Rs. 150.00 per sq.m. Determine the net rent of the property, if the expenditure on all outgoing including sinking fund is Rs. 24000/- per annum. Work out also gross rent of the property per month.

$$\text{cost of construction} \Rightarrow 700,000.00$$

$$\text{cost of land @ } 150.00 \text{ per sq.m} \Rightarrow \\ 150 \times 100 \Rightarrow \underline{\underline{15000.00}}.$$



Net return

On building @ 6% on the cost of construction

$$= \frac{6}{100} \times 7,00,000 \Rightarrow 42,000.00$$

On the land @ 4% on the cost of land

$$= \frac{4}{100} \times 1,50,000 \Rightarrow 6,000.00$$

$$\underline{\hspace{10em}}$$

$$48,000.00$$

\therefore Gross rent = Net rent + Outgoings

$$= 48,000 + 24,000$$

$$= 72,000.00 \text{ per annum}$$

(v) Gross rent per month = $\frac{72,000}{12} = \underline{6,000.00}$

* Capitalised value of a property fetching a net annual rent of Rs. 100,000 and the highest rate of interest prevalent being 5% is as follows :-

Sol: Given net annual income ~~x~~ $= 1000.00/-$

$$\text{Rate of interest} = 5\%$$

\therefore Capitalized value = Net annual income \times Years purchase

$$\therefore \text{Years purchase} = \frac{100}{5} \times \cancel{100} = \cancel{20} 20$$

$$\Rightarrow 20.$$

$$\therefore \text{Capitalized value} = 1000 \times 20$$

$$= \underline{20,000/-}$$

\Rightarrow for the same net income if the rate of interest is 8%. What is the capitalized value.

Sol: Net income = $1000/-$ \therefore Capitalized value
 $\text{Years purchase} = \frac{100}{8} = 12.5$ $= 1000 \times 12.5$
 $\Rightarrow 12,500/-$



A pumping set with a motor has been installed in
building at a cost of Rs. 2,500.00. Assuming the life
of the pump as 15 years, work out the amount of annual
installments of sinking fund required to be deposited to
accumulate the whole amount of 4% compound interest.

Sol.

Given pumping set
cost price q) building = 2,500 = 5

Compound interest rate $i = \frac{4}{100} = 0.04$

5

Annual sinking fund, $P = \frac{S_i}{(1+i)^n - 1}$

$$n = \text{no. of years} = 15 \text{ yrs.}$$

$$\frac{1}{r} = \frac{2500 \times 0.04}{(1+0.04)^{15} - 1}$$

$$= \frac{100}{0.8}$$

1 \Rightarrow 1251-

I $\Rightarrow 125/-$

2) An old building has been purchased by a person at a cost of Rs. 30,000/- excluding the cost of the land. Calculate the amount of annual sinking fund at 4% interest assuming the future life of the building as 20 years and the rate of interest at 10% of the cost of purchase.

695

$$\text{the end of 20 years.} \quad 100 - 10 = 90$$

$$S = 30,000 \times \frac{90}{100} \Rightarrow 27,000.00$$

$$\text{end qf 20 years} \cdot \frac{(100-10)}{100} \\ S = 30,000 \times \frac{90}{100} \Rightarrow 27,000 \cdot 00$$

$$\text{Annual Sinking fund, } I = \frac{SI}{(1+i)^n - 1} \quad (\frac{1}{100})$$

$$I = \frac{27,000 \times 0.04}{(1+0.04)^{20} - 1}$$

$$= \frac{1080}{1.19}$$

(6)

$$\underline{I = 907.56/-}$$

* A property building is situated by the side of a main road.

* Calculate the standard rent of a government residential building newly constructed, from the following data :-

- 1) Cost of land = 100,000/-
- 2) Cost of construction = 400,000/-
- 3) Cost of roads within the compound & fencing = 20,000/-
- 4) Cost of sanitary & water supply works @ 8% of cost of building.
- 5) Cost of electric installation including fans @ 10% of the cost of the building.
- 6) Municipal house tax = 400/- per annum
- 7) Water tax = 250/- per annum
- 8) Property tax = 140/- per annum.

Given cost of land = 10,000/-

Cost of construction = 40,000/-

Cost of roads within the compound & fencing = 20,000/-

Cost of sanitary & water supply works @ 8% of cost of building

Cost of electric installation including fans @ 10% "



Determining the total capital cost of building (4)

Method - I

Total capital cost = cost of building + cost of roads & fencing
+ sanitary cost + electric installation cost.

∴ 1) Water supply & sanitary cost

$$\Rightarrow \frac{8\%}{100} \text{ of cost of building}$$

$$\Rightarrow \frac{8}{100} \times 40000$$

(1)

$$= 3200/-$$

2) Electric installation $\Rightarrow 10\% \text{ of cost of building}$

$$\Rightarrow \frac{10}{100} \times 40000$$

$$= 4000/-$$

∴ Total capital cost = $40,000 + 2000 + 3200 + 4000$
 $\Rightarrow 49200/-$

∴ Assume 6% of standard rate interest on capital cost

$$\therefore \text{Interest on capital cost @ } 6\% = 49200 \times \frac{6}{100}$$

$$\therefore \text{Interest on capital cost} \Rightarrow \underline{\underline{2952}}/-$$

∴ Standard rent on @ 6% interest = $2952/-$ per annum on capital cost.

Method - II

1.5% of cost of building are used for repairing buildings & roads

(constant) (cost of construction + cost road)

i) Annual Repairs:

ii) Repair cost for building & roads \Rightarrow

$\Rightarrow (\text{cost of construction} + \text{cost road}) \times \frac{1.5}{100}$

$$\Rightarrow (40,000 + 2000) \times \frac{1.5}{100}$$

$$\Rightarrow \underline{\underline{630}}/-$$



b) 1% of sanitary cost are used for repairing sanitary & water supply works

i) cost of repairing sanitary & water supply

$$= \text{Cost of sanitary} \times \frac{1}{100}$$

$$\Rightarrow 3200 \times \frac{1}{100}$$

$$= 32/-$$

9) 1.5% of electric installation cost are used annually

$$\Rightarrow \text{Electric installation cost} \Rightarrow \text{Cost of E.I.} \times \frac{1.5}{100}$$

(8)

$$\Rightarrow 4000 \times \frac{1.5}{100}$$

$$= 60/-$$

∴ Total annual repair cost = 630 + 32 + 60

$$\Rightarrow 722/- \text{ per annum.}$$

i) Special Repairs

A special repairs of 0.6% on buildings, 3.5% on sanitary & water supply works, 3.5% electric installations are made annually

(40000+2000)

$$\therefore \text{Building & roads @ } 0.6\% = 42000 \times \frac{0.6}{100}$$

$$\Rightarrow 252.00/-$$

$$\text{b) Sanitary & water supply works @ } 3.5\% = 3200 \times \frac{3.5}{100}$$

$$\Rightarrow 112.00/-$$

$$\text{c) Electric installation @ } 3.5\% = 4000 \times \frac{3.5}{100}$$

$$\Rightarrow 140.00/-$$

$$\text{Total special repair cost} = 252 + 112 + 140$$

$$\Rightarrow 504.00/- \text{ per annum.}$$



Adding Method I & Method II

Total standard rent = Standard rent @ 6% interest + Annual repair cost + Special repair cost + Municipal house tax + Govt. property tax

$$\Rightarrow 2952 + 722 + 504 + 400 + 140$$

$$\Rightarrow \underline{4718.00/- \text{ per annum.}}$$

Standard rent per month = $\frac{\text{T. Standard rent}}{12}$

(9)

$$= \frac{4718}{12}$$

$$\Rightarrow \underline{393.00 \text{ per month.}}$$

Find the plinth area required for the residential accommodation for an Assistant Engineer in the pay scale of Rs. 400. to 1000 per month.

$$\text{Given Average pay} = \frac{400 + 1000}{2} = \frac{1400}{\sum} = 700 \text{ per month}$$

$$\text{Average monthly rent @ 10% qf salary} = \frac{700}{10} = 70.00.$$

$$\text{Avg. annual rent} = 70 \times 12 \Rightarrow 840.00.$$

$$\text{Capital cost of building @ 6% interest} = \frac{840 \times \text{Annual rent}}{6 \times \text{Years Purchase}}$$

$$\Rightarrow 840 \times \frac{100}{6}$$

$$\Rightarrow 14000.00.$$

Plinth area required @ 150.00 per sq.m qf plinth area

$$\Rightarrow \frac{14000}{150} \left(\frac{\text{cost qf building}}{\text{Plinth area rate}} \right)$$

$$\text{Plinth area} \Rightarrow \underline{93.33 \text{ sq.m.}}$$



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