Two sites are being considered for a bridge in NY.

the North site requires a suspension bridge that has an initial cost of $50 Million and Annual inspection and maintenance costs of $35 K. It concrete deck has to be resurfaced every 10 years at a cost of $100 K. Purchasing right-of-way costs 1 M.

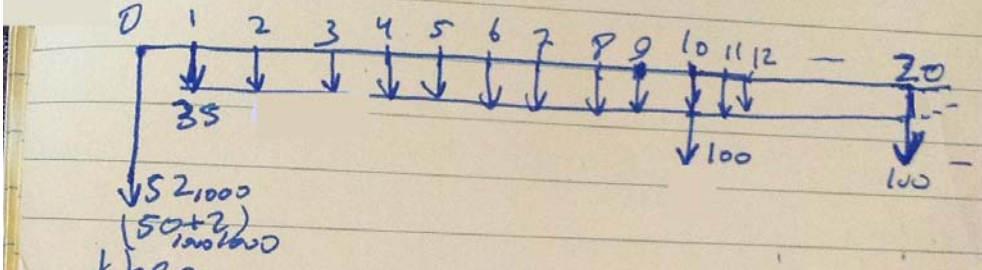
the South site requires a truss bridge with an inital cost of $25 M and annual insp. and maint. costs of $20 K. It has to be painted every 3 years for $40 K and sandblasted every 10 years for $190 K. purchasing right-of-way costs $5 M.

interest rate, $i = 6\%$.

which bridge should be built?

suspended

North site bridge cash flows are as follows:



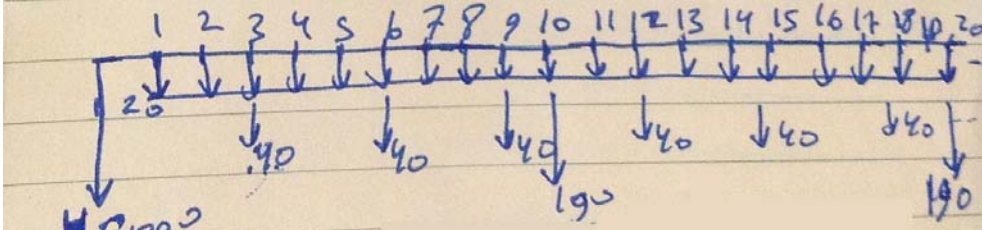
then,

$$CC_N = \$52{,}000 + \frac{35}{0.06} + 100(A|F, 6\%, 10)/0.06$$

$$= \$52{,}000 + \frac{35}{0.06} + 100 \times \frac{0.06}{(1.06^{10}-1)} \times \frac{1}{0.06}$$

$$= \$52{,}709.78\text{ K} \cong \$52.71\text{ M}$$

For South truss site bridges



$$CC_S = \$40{,}000 + \frac{20}{0.06} + \frac{40(A|F, 6\%, 3)}{0.06} + \frac{190(A|F, 6\%, 10)}{0.06}$$

$$\$40{,}000 + \frac{20}{0.06} + \frac{40}{1.06^3-1} + \frac{190}{1.06^{10}-1} \cong 40.78$$

Choose South-Side bridge!