Main Building Refurbishing Project at NIM

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The Issue

The approach of Mid-India Construction Company (MICC) in the case of Main Building Refurbishing Project (MBRP) at NIM is an example of "failing to plan is planning to fail". The MICC was well aware of the project completion deadline while bagging the contract. While planning the execution, MICC proposed the resources as given in exhibit 3 of the case. If we try to analyse the planning made by MICC then we will get the following results.

Table 1

Activity	Work Content (Sqm)	Work rate (sqm/team/day)	Planned Resources (No. of teams)	No. of days required to complete the activity
A	2000	250	4	2
B	2000	36.36	11	5
C	2000	36.36	11	5
D	200	40	1	5
E	200	40	1	5
F	2000	41.67	8	6
G	2000	41.67	8	6
H	2000	400	5	1
I	2000	33.33	12	5
J	2000	62.5	6	5
K	2000	62.5	6	6
L	2000	40	10	5
M	1743	41.5	7	6
N	1743	51.26	5	7
O	1743	51.26	5	7
P	1743	41.5	6	7

The Exhibit 1 of the case gives us the manner in which activities can be performed. Activity A to G should be performed sequentially. From the table above, as per the MICC's original plan, activities A to G will require 34 days to get over. MICC desires to finish two fronts of 2000 Sqm each, every month but with above planning, MICC may require up to 70 (= 34 days for activities A to G, 1 day for activity H, 14 days for curing, 21 days for external painting) days for one front! This gives us the clear picture of what MICC wanted to achieve and what exactly it had planned for. Exhibit 4 is the evidence of delays in almost all activities. The number of teams employed is even less than those were planned suggesting serious lapses in execution. This suggests that execution will take more than 70 days for one single front to be complete.

The worry of NIM Director regarding slow pace of MBRP is thus fully justified. This was conveyed by the Director to Rao who eventually brought it to the notice of Sharma. In order to ensure the timely completion of MBRP, Rao came up with an idea of Parallel execution instead of serial execution as planned initially by the MICC.

The Parallel Execution Plan

Rao suggested that MICC should start working on 4 different fronts parallel instead of completing one front after the other. Since any two 2000 Sqm fronts were practically independent of each other, parallel execution is feasible. All that MICC requires to run activities parallel in four different fronts are four sets of scaffolding. As given in the case one set of scaffolding will cost MICC Rs. 2,70,000. Thus additional 3 sets will cost MICC additional Rs. 8,10,000. Sharma should realise this quickly and he should convince his superiors at MICC to make the additional scaffolding available. The cost benefit analysis for MICC is given in Table 2.

There is direct labour and direct material cost for one front of 2000 Sqm of external work plus one front of 1743 Sqm of internal fronts. Since there are 14 such fronts hence this will be multiplied by 14 giving Rs. 2,64,60,700. Adding to this will be the indirect cost (Supervision Rs. 19285 per front, hence 2,69,990 for 14 fronts plus 2,70,000 for at least one scaffolding) of Rs. 5,39,990 will make the final cost for MICC as per the original planning as Rs. 2,70,00,690.

Table 2

Activity	Work Content (Sqm)	Cost (Rs./sqm)	Cost per Activity (rupees)
A	2000	33	66000
B	2000	85	170000
C	2000	75	150000
D	200	93	18600
E	200	95	19000
F	2000	207	414000
G	2000	188	376000
H	2000	19	38000
I	2000	19.5	39000
J	2000	37	74000
K	2000	66	132000
L	2000	66	132000
M	1743	22	38346
N	1743	22	38346
O	1743	53	92379
P	1743	53	92379
Total Cost			1890050

By buying 3 more scaffoldings worth Rs. 8,10,000 will make MICC total cost for the project as Rs. 2,78,10,690 which will be still below the contract amount of Rs. 3 crore. This suggests that buying 3 more scaffolding will not cause overall loss for the MICC and hence it's a viable suggestion. Also note that, as per exhibit 2 of the case NIM can withheld a total amount of Rs. 10,00,000 due to non timely completion by the MICC. With the current approach of sequential execution, MICC can't meet any of these deadlines for the MBRP thus incurring this penalty. It eventually makes a wise choice to buy 3 more scaffoldings at a cost of Rs. 8,10,000 to avoid a penalty of Rs 10 Lakhs! Not only can it save some money for MICC but also save its face for future contracts.

Future Course of Action for Sharma

With the above discussion, Sharma should realise that the initial idea to finish two fronts per months was feasible only with proper planning which went completely out of track with MICC's original plan. The time required for 2000 Sqm front (including 1743 Sqm internal front) is 67 days. (Few activities such as A and H can be done along with activities B to G). Almost one front work is done by 26 Dec 2012 so with remaining 7 months, 13 fronts to be completed. Thus available time is nearly 210 days with four parallel fronts execution each of 67 days can be met with some smart efforts. Curing period of 14 days should be utilized to move the scaffolding and start a new front. This will enable MICC to meet the phase wise as well as overall deadlines without penalty and loss of reputation. Table 3 gives the required teams for each activity for 4 parallel external fronts and 2 parallel internal fronts.

Table 3

Activity	Work Content (Sqm)	Planned Resources (No. of teams)
A	2000	16
B	2000	44
C	2000	44
D	200	4
E	200	4
F	2000	32
G	2000	32
H	2000	20
I	2000	48
J	2000	24
K	2000	24
L	2000	40
M	1743	14
N	1743	10
O	1743	10
P	1743	12

It should be noted here that by increasing the teams in a construction work will actually not affect the labour cost. The labour cost will be the same in sequential execution as well as in parallel execution. Hence Sharma should convince his superiors at MICC to deploy 3 more sets of scaffolding, multifold labour teams as given in table 3 and achieve the completion of MBRP in due time profitably.

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