Identification of Preconstruction Delay in Construction of Bridge Flyover

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Abstract- *The construction of bridge flyover is one of important ingredient in development of city and Bridge flyover is became lifeline in the metro cities to reduce the traffic. As extensive delay in flyover project causes the inconvenience to the people who are using the facilities plus it causes exceed in initial time and cost estimation. In most of projects delay can be divided into preconstruction delay and construction execution delay. This study is conducted to find out pre construction delay occurred in the one of the bridge flyover construction project in metro city junction, COEP, Pune. From the results it can be concluded that the causes of delay that occurred in the project were responsibility of the client and related government bodies. So the preconstruction delays were caused due to failure of fulfilling clients' responsibility and related government bodies.*

Keywords- causes of delays, delay analysis, flyover project, extension of time, preconstruction delays.

I. INTRODUCTION

Project delays are the most common and costly problem encountered on construction projects. We are in 21st century but in India delay in construction project is still normal thing. Many of authors have done the study in delay analysis of building projects, highway projects but very few have studied bridges and to that no one have carried out work in delay analysis of flyover bridge projects.

Construction delays are widespread in most projects around the world. Some delays may happen in the preconstruction phase which is defined as the period beginning from the initial conception of the project to the signing of the contract between the owner and the contractor; however some of them may happen in the construction phase that is the period when actual construction is under way. Project schedules are dynamic and uncertain. Several factors, controllable and uncontrollable, affect the project schedule and cause delays. These delays definitely create negative impacts on project performance. The challenge is to measure the net impact of construction delays accurately.

This paper focuses on the study of identification of preconstruction delays caused in construction of bridge flyover project at COEP, Pune.

II. CASE STUDY

The project consists of 3 multilevel flyovers, namely, A, B and S. The type of contract with the contractor was Item rate contract. The contract was given to the lowest bidder and here, the contract was given for 36% above the cost of project. The following table gives project information

Name of the Project	Construction of flyover from College Of Engineering, Pune to Patil Estate.
Project location	College Of Engineering, Pune Junction
Total cost of the project	Rs. 40,08,04,922.64/- (40.08cr)
Project commencement date	03-01-2012
Project duration	36 Months (scheduled)
Project completion date(S)	15-10-2016
Client	Pune Municipal Corporation
Contractor	J. Kumar Infra Projects Ltd. (& T & T Infra for an arm of flyover A)
Consultant	Kashec Engineers Pvt Ltd

Table 1: Project Information

Flyover A:
For through traffic from RTO/ Pune station to Wakadewadi

Total Length = 800 m
Width = 13.5/10.5 m
Total cost = Rs. 2577 Lakhs/-
Bridge spans: Length = 600 m,
Width = 13.5-10.5 m,
18 spans of 30 m each and 3 spans of 20 m,
Cost = Rs. 2382 Lakhs/-

Solid approach: Length = 200 m,
Width = 13.5-10.5 m with RE walls,
Cost = Rs. 195 Lakhs/-

Flyover S:

For through traffic from Sangamwadi bridge to Sancheti ROB crossing COEP junction

Total Length = 445 m
Width = 10.5/7 m
Total cost = Rs. 1431 Lakhs/-
Bridge spans: Length = 395 m,
Width = 10.5/ 7 m, 6 spans of 30 m each, 3 spans of 25 m each and 1 span of 20 m
Cost = Rs. 1389 Lakhs/-
Solid approach: Length = 50 m,
Width = 7 m with RE walls,
Cost = Rs. 42 Lakhs/-

This study is limited to the flyover A and flyover S. Hence, causes of preconstruction delays are applicable for flyover A and flyover S.

Layout of the flyover project is shown below and highlighted area of blue, brown and green shows the some major concerned area on account of which preconstruction delay was caused.

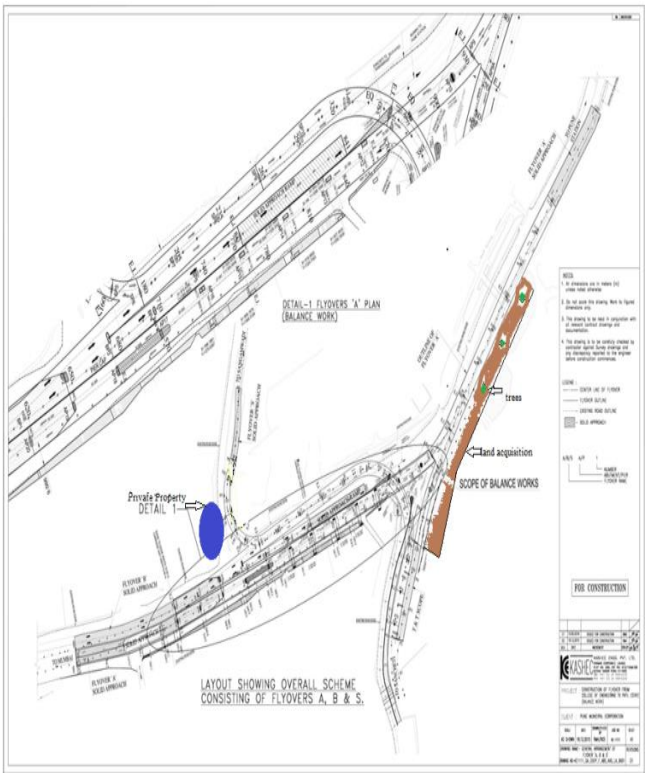

Figure 1- Layout of flyover project

III. DATA COLLECTION

Construction of A flyover and S flyover work were re-planned and actual started on 29th January 2014 because of delay. Earlier it was planned to start on 22nd September 2012.

For commencement of pre-construction activity of the project duration allotted was from 3rd January 2012 to 22nd September 2012.

From the daily progress report as built data is created of the flyover project.

As planned scheduled of the project is obtained and planned schedule of the project of flyover A and Flyover S are as follows-

Figure 2- Planned schedule of the flyover project

IV. DATA ANALYSIS

For data analysis activity of flyover project has been compared with its planned duration and actual duration.

Comparing planned duration and actual duration observed maximum delay in the project was 494days.

Causes of pre-construction delayed are listed below-

1. Land acquisition COEP
2. Political issue
3. Environmental clearance
4. Acquisition of private property(Sangamwadi)

5. Structural changes in design
6. Railways permission
7. Maharashtra state electricity distribution board permission
8. No cooperation between government departments

Following table and bar chart shows the actual duration of delay on account of pre-construction.

Sr. No.	Activity-Cause of Delay	Commencement date	Planned	Actual	Duration(days)
1	COEP Land acquisition	3/1/2012	22/09/2012	22/06/2013	273
2	Political issue*	3/1/2012	16/10/2012	10/06/2013	237
3	Environmental clearance	3/1/2012	22/06/2013	12/09/2013	82
4	Acquisition of private property(Sangamwadi)	3/1/2012	12/09/2013	13/11/2013	62
5	Structural changes in design	3/1/2012	13/11/2013	05/01/2014	53
6	Railways permission	3/1/2012	06/01/2014	11/01/2014	5
7	Maharashtra state electricity distribution board permission	3/1/2012	11/01/2014	29/01/2014	29
				Total	494

*Political issue is excluded from the addition of total delay as it is as concurrent delay with land acquisition.

Following bar chart shows the planned vs actual duration

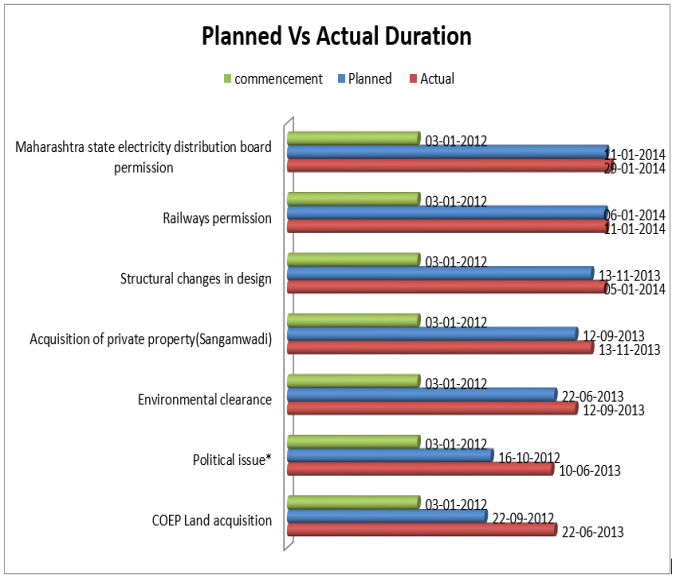

Figure 3: Planned Vs Actual Duration

1. Land Acquisition:

Here were two land which were responsibility of client to acquire for the successfully execution of work and avoid delay in the project. One of land was COEP property and another land was private property of Patil-state at Sangamwadi approach. Because of these two issues total 335 days delay cause in the project.

2. Political Issue:

As political parties were also supporting COEP to take advantage of the situation to enhance their vote banks as there was petition also filed by joint signatory of Sujit Patwardhan of Parisar, Jugal Rathi of PMP Pravasi Manch, Dilip Sarda of Pune Cycle Prathisthan, Prashant Inamdar of Pedestrians First and Satish Khot of the National Society for Clean Cities. Petition was sent to Chief Minister of Maharashtra as constructing flyovers is not a sustainable traffic solution. It provides a temporary relief and the problem becomes serious after a few years. Because of this issue total 237days delay was cause in the project.

3. Environmental Clearances:

After successfully acquiring permission from COEP land there was three trees in layout of the flyover project. As these trees were located in land which were acquired from COEP so to took environmental clearance from 'State Level Environment Impact Assessment Authority' constituted by Central Government caused separate 82days delay in the project.

4. Structural Changes In Design:

After successfully obtaining permission from various government bodies there was change in the layout of the project. Because changed in layout structural designed occurred which took 53days delay.

5. Railways Permission:

One slab of section of flyover was to constructed above the existing overlaid railways line so it was mandatory to take prior permission from rail development authority of India. But rail development authority was very cooperative so only 5 days delay was caused.

6. Maharashtra State Electricity Distribution Board Permission:

As one slab of section of flyover was too constructed above the existing railways electricity transmission lines so permission from Maharashtra state electricity distribution board was necessary to carry out work and which caused 19days delay.

7. No Cooperation Between Government Departments:

Many different Government bodies like COEP, Pune Municipal Corporation, State Level Environment Impact Assessment Authority, rail development authority were involved in this project but there was no coordination amongst them due to which project suffered delay.

V. CONCLUSIONS

It is well documented that claims related to project delays are now a major source of dispute in the construction industry. It was possible completely avoid this problem however this has created considerable research interest among researchers and practitioners.

From the result obtained it was observed that total preconstruction delay of effective 494 days (excluding political issue) was caused due to client and related government bodies who have failed to fulfill their roles and responsibilities.

It is advisable for such type of project even though preliminary time of 8 months was reasonable after signing of contract for the solving all the above issues which caused delay should have been solved within specified period. As the different government bodies were involved in the project like COEP, Pune Municipal Corporation, State Level Environment Impact Assessment Authority and Rail Development Authority which were at different place though sufficient time for the communications and taking decision was provided for above bridge flyover but still client failed to achieve in taking clearance from several government bodies within stipulated time.

It is essential that the contract executing authorities should give sufficient authority to take on-spot decision on such type of project by specially posted officers for this work.

Due to non-provision of the same contractor gets advantage for putting an extra claim on this account for substantial loss of time and undue expenditure involved by him.

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