Study And Analyze of Delay In Commercial Construction Projects

S.Sakthivel [1], R.Dhanasekar [2]
[1]Assistant Professor, Dept of Civil Engineering
[2]Dept of Civil Engineering
[1, 2] The Kavery Engineering College, Mecheri, Salem, Tamilnadu

Abstract- *This project deals with the study of various delays incurred in project and also analyze the construction project for this study. I prepare a data collection and detailed investigation report on delay which is collected by conducting survey of various from located around Salem. This survey helps of study of delay and their effects in construction project cycle and I suggest the solution for delay causes and also I prepare a distinct estimate report of commercial project by using MS project software.*

I. INTRODUCTION

Delay is generally acknowledged as the most common, costly, complex and risky problem encountered in construction. Comes due to the dominant importance of your time for each the Owner (in terms of performance) and also the Contractor (in terms of money), it's the supply of frequent disputes and claims resulting in lawsuits. To regulate this case, a contract is developed to spot potential delay things beforehand and to outline and fix obligations to preclude such controversies. a considerable variety of General Condition's clauses address this subject in a method or another. Construction delays are important factors to be considered as time lag in completion of activities in the project. It creates undefined schedule ms communication between contractors and owners. It leads to increase the expenses of project, wages of labour rise the rate of interest if the project established with loan amount.

II. TYPES OF DELAYS

1. critical and non – critical delays
2. excusable and non – excusable delays
3. concurrent and non- concurrent delays
4. compensable and non- compensable delays

III. CAUSES OF DELAYS

- Possessive decision-making mechanism.
- Highly bureaucratic organization.
- Insufficient data collection and survey before design.
- Site's topography is changed after design.
- Lack of coordination at design phase.
- Inadequate review.
- Improper inspection approach.
- Different attitude between the consultant and contractors.
- Financial difficulties.
- Inexperienced personnel.
- Insufficient number of staffs.
- Deficiency in project coordination.
- Often changing Sub-Contractors Company
- Inadequate and old equipment.
- Lack of high-technology equipment.
- Harvest time.

IV. EFFECTS OF DELAY

- Over cost of project
- Over time of workers
- Litigation
- Disputes
- Abandonments claim interest.

V. DATA COLLECTION

In this project delays are measured with the consideration of following factors that are grouped depending upon their nature of occurrence.

The factors are ranged in the scale ratio aspects such as

A_0 - there's no delay in the factors
A_1 - delay may be compensable
A_2 - delay may be compensable
A_3 - delay may be non excusable
A_4 - delay may be critical or non-critical

Methods Used for Delay Analysis

The delays are analyzed by using following methods

- Relative Importance Index (RII) method
- Critical Path Method scheduling (CPM) method
- As-Planned vs. As-Built method

- Impacted As-Planned method
- Collapsed As-Built or "But for" method
- Window Analysis method
- As-Built method
- Contemporaneous method

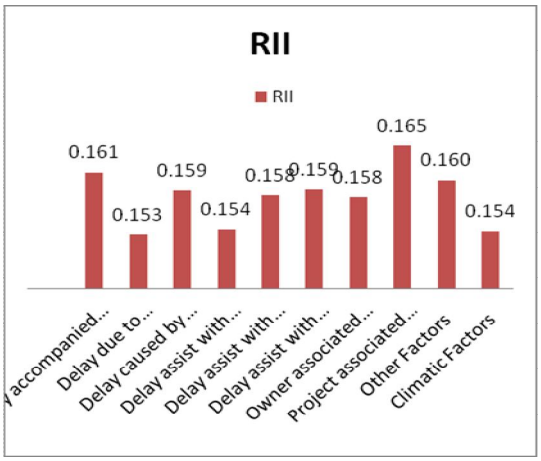
VI. RESULTS AND DISCUSSION

For study of this project, I used the “Relative Importance Index” (RII) Method to analyze the delay analysis. Because this method is very simple and less discrepancy will arise while analyzing the delay factors. From the data collection; the relative importance index (R.I.I) was calculated for every single reason to detect greatest and smallest momentous project delay factors in the industry.

S. No	Factors to be Considered		Scale Measurement (Ai)					Sum	RII
			A_5	A_4	A_3	A_2	A_1		
1	Delay accompanied with consultant	Inadequate knowledge of Consultant in construction	5	1	1	3		22	0.163
		Conflicts between design Engineer and Consultant	7	3				19	0.163
		Lack of performing inspection and testing	8	2				12	0.111
		Delay in revising and approving design papers	2	1	5	1	1	28	0.156
Delay accompanied with consultant			22	7	6	4	1	75	0.161
2	Delay due to contractor	Changing of subcontractors again and again	6	2	2			16	0.160
		Lack of skill of contractor	3	2	3	2		24	0.153
		Rework due to errors	5	3	2			17	0.155
		Old technology used	3	5	2			19	0.146
		Improper planning and scheduling	7	3				13	0.163
		Unsuitable construction procedures	2	5	2	1		22	0.141
Delay due to contractor			26	20	11	3	0	111	0.153
3	Delay caused by design factors	Difficult in Design	1	4	2	1	2	29	0.153
		Design errors		5	2		3	31	0.151
		Nonexistence of skill of design team in construction	3	4	1	1	1	23	0.153
		Errors and late in producing design papers	7	1	1	1		16	0.168
		Wrong understanding of owner's necessities by designer	8		1	1		15	0.176
		Confusion of ideas in design	1			5	4	41	0.164
Delay caused by design factors			20	14	7	9	10	155	0.159
4	Delay assist with Equipment	Improper selection of equipment	2	4	3		1	24	0.150
		Shortage of equipment		4	5	1		27	0.146
		Frequent equipment breakdowns			4	4	2	38	0.158
		Low efficiency of equipment	5	1	2	2		21	0.162
Delay assist with Equipment			7	9	14	7	3	110	0.154
5	Delay assist with Labours	Shortage of workers			4	3	3	30	0.150
		Small output of labour		2	5	1	2	33	0.150
		Own clashes among labour	4	2	2	1	1	23	0.150
		Strike	5	1	2	1	1	22	0.163
		Unqualified / inadequate experienced labor	4	2	2	2		22	0.157
Delay assist with Labours			13	7	15	8	7	130	0.158
6	Delay assist with Materials	Modifications in material variation and specifications in the course of construction	3	1	1	2	3	31	0.163
		Destruction of arranged materials	5	2	1	1	1	21	0.162
		Late delivery of materials	3	2	4		1	24	0.155
		Shortage of construction materials	2	3	2		3	29	0.151
Delay assist with Materials			13	8	8	3	8	105	0.159

7	Owner associated factors	Clashes between partners	6	2	2			16	0.160
		Late in progress outflows	3	2	2	1	2	27	0.159
		Late in site supply	3	2	1	4		26	0.158
		Wrong feasibility study of project	2	1	2	4	1	31	0.159
		Less understanding of owner in construction	7	3				13	0.163
		Absence of motivations for contractor to complete ahead of plan	4	4	1	1		19	0.152
Owner associated factors:			25	14	8	10	3	132	0.158
8	Project associated factors	Difficulty of project	6	1	1	1	1	20	0.167
		Legal disputes between project participants	5	1	2	1	1	22	0.163
		Unfavorable contract clauses	7	2	1			14	0.165
Project associated factors:			18	4	4	2	2	56	0.165
9	Other Factors	Accidents during construction	6	2	1	1		17	0.162
		Changes in government regulations and laws	7	1	1	1		16	0.168
		Late in earning licenses from municipality	3	2	2	1	2	27	0.159
		Late in final check and approval by a third party	2	3	3	1	1	26	0.158
		Late in giving services	6	2	1	1		17	0.162
		Price fluctuations	5	1	2	1	1	22	0.163
		Problem with neighbors	6	2	2			16	0.160
Other Factors:			35	13	12	6	4	141	0.160
10	Climatic Factors	Due to Rain	3	2	3	2		24	0.155
		Un favorable conditions like cyclone, earthquake etc.,	4	3	3			19	0.152
Climatic Factors:			7	5	6	2	0	43	0.154

S. No	Factors to be Considered	Scale Measurement used in (%)					Scale	RII	RANK
		A_0	A_1	A_2	A_3	A_4			
1	Delay accompanied with consultant	22	7	6	4	1	75	0.161	2
2	Delay due to contractor	26	20	11	3	0	111	0.153	7
3	Delay caused by design factors	20	14	7	9	10	155	0.159	4
4	Delay assist with Equipment	7	9	14	7	3	110	0.154	6
5	Delay assist with Labours	15	7	15	6	7	133	0.158	5
6	Delay assist with Materials	13	8	8	3	8	105	0.159	4
7	Owner associated factors	25	14	8	10	3	132	0.158	5
8	Project associated factors	18	4	4	2	2	56	0.165	1
9	Other Factors	35	13	12	6	4	141	0.160	3
10	Climatic Factors	7	5	6	2	0	43	0.154	6



VII. CONCLUSION

This project deals with the study and analysis of delays in commercial construction projects. For the study and analysis I prepare a detailed questionnaire survey and analysis the delay by using relative importance index (RII) method. Delay is the most important factor than influence the increase in overall cost, difficultly to complete the project at right time and schedule. Some recommendations would be proposed for reducing the chances of delay.

i. Contractors are advised to avoid the unwanted contract clauses, unskilled workers, improper construct procedures
ii. Designers are recommended that the minimize the design errors, excellence in preparing the design

detailing of concrete members and increase the ability of labours to understand the design detailing

iii. Owners are insisted to make all materials required for construction in ready manner use efficient equipment with better output performance, employ the skilled labour have both technical and non-technical skills, use labours in efficient and safe

REFERENCES

[1] Alena Vasilyeva-Lyulina, Masamitsu Onishi and Kiyoshi Kobayashi (Delay Analysis Methods for Construction Projects: Mathematical Modeling) 2015
[2] Leena Mali, Abhijit Warudkar (Analysis on Causes of Delay in Construction Industry in Pune City) 2016
[3] Ahmed Taghi Multashi, Rohit R. Salgude (Delay Analysis in Construction Project a Case Study-Alkut Olympic Stadium) 2013
[4] Serdar Durdyev, Maksat Omarov and Syuhaida Ismail (Causes of delay in residential construction projects in Cambodia) 2017
[5] Anil Upadhyay, Vaishant Gupta,Dr. Mukesh Pandey (a case study on schedule delay analysis in construction projects in gwalior) 2016
[6] Anil Upadhyay, Himanshu Agrawal, Hanish Jain (a study: contractor related delay factors in construction) 2016
[7] Jyh-Bin Yang, Chih-Kuei Kao and Yi-Yao Lee (system requirement analysis of a construction delay analysis system) 2006
[8] Shruthi Sivaprakasam, S.Dinesh ,J. Jayashree (A Review on Causes of Delay in
[9] Construction Projects) 2017
[10] Kuei-Mei Huan, Jyh-Bin Yang, Chang-Hung Lee, and Ruei-Yu Ku (case study of delay impact analysis of lost productivity in construction projects)
[11] Pedro Manuel Mendes Baptista (Direct Costs Variance Analysis in Construction-Contribution for the Management of Economical Risk in Construction Companies-)
[12] Aishwarya Prashant Patil (Analysis of Cost over run in construction Projects) 2017
[13] Renata Stasiak-Betlejewska ,Marek Potkány (Construction Costs Analysis And Its Importance To The Economy)2015
[14] Salahi Pehlivan,Ali Erhan Öztemir (Cost Overrun Estimation of Construction Project with Significant Risk Factors)
[15] M.Montes, R. Falcón,A.Ramírez (Estimating building construction costs: analysis of the process-based budget model (POP Model)) 2016
[16] Pramen P. Shrestha,Leslie A. Burns,and David R. Shields (Magnitude of Construction Cost and Schedule Overruns in Public Work Projects) 2013