

# A PAPER ON A STUDY ON COST OVER RUN ELEMENTS IN ROAD CONSTRUCTION DUE TO DELAY

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## Abstract

The main purpose of review study is to determine different important factor which cause obstruction time in the progress of project execution and this causing delay in computation of project in this indirectly increasing the cost of project. After receiving the different publish paper in related with mentioned topic. It reveal that factors like use of modem equipment modern construction techniques management of skill labor and efficient scheduling of man material and machinery may help in the smooth recovery of construction work also it given the idea of venom factors which are mostly responsible for delay in work and cost over.

**KEYWORDS-** Cost and time overrun, delay factors, Road construction, Relative Important Index Method (RII), Weighted Average Index Method, Spearman Rank Correlation

## I. Introduction

The construction industry contribute a greater hunk in the Indian economy one of the major part of this industry good construction land, transportation define the foundation for infrastructure in any country. India ranks 2<sup>nd</sup> in the term of road network after USA in the world. The construction, maintenance management of road are is done at various level. As road construction requires homogeneous expenditure, thus cost should taken care of while planning. In this paper a review is made of various articles and papers related cost of roads and various elements involve in it.

## II. Literature Review

On the base of the study of review paper various factors are being noted that need to be change to reduced overrun cost of road and also other construction of any building also. These factor are mention in other slides. The aim of the project is to managers and complete the Construction work in given time, budget and with desired quality because if it increase then it cost overrun delay in the Road construction work. To control various are be done to stop these thing that will be completed on time without overrun cost increase of building. We prepare suitable plan i.e is why we will be are being able to control them easily. The coordination between Engineer, Contractor and client is also being very important. After studying many review paper few to be noted which help to complete my survey.

## III. METHODOLOGY

In this methodology we discuss and perform different task as it will be help be in this project , as we done several task is different under proper knowledge as per Road construction. First we going to preformed Literature survey and prepare a Questionnaire in different ways to collect the data Road construction delays with different points and then we are going to analysis the data with Relative Important index methods with different methods also we can analysis these data and then we are going on a result and conclusion.

## IV. DATA COLLECTION

These data is obtained from two ways first by offline survey and second by online survey (Google form). This survey included only listed people because these people can actually tell us about actual ways of that how Road constructions are delayed; these are Engineers, Contractors and clients.

Table 1: Rate of Reponses

Sr. no.	Types	Total No. Approach	No. Responses Received	Percentage of Responses
1	Client	20	13	65%
2	Engineer	27	22	81.48%
3	Contractor	25	18	72%
Total		69	53	72.82%

## V. QUESTIONNAIRE DESIGN

In this questionnaire is design on the basic of survey that helps to lead different point and some curtain subject or points. These surveys also made by online and offline survey and online survey is based on Google form survey. This Questionnaire is basically pre-coded question are being mention in questionnaire and mainly these are tick type question. These questions are being selected on the basic of survey to client, Engineer and contractors. There are total 18 total question mention in questionnaire and these are rated on the basis of Likert Scale method is being used to measure the responses such Strongly disagree, disagree, neutral, agree, strongly agree.

## VI. DATA ANALYSIS

Once the data has been collected successfully then it will be analysis works. These data are to represent on Excel sheet software and was used to calculate and analyze statistical data which was collected in the questionnaire so as to carry out the data analysis in this research.

### 1. Relative Important Index Method (RII)

Calculation of these Data on these tables were analyzed by Relative important index method

$$RII = \frac{\sum n}{(A \times N)}$$

Where RII = index score for risk ,

n= weight given to each factor by the respondents, ranges from 1 to 5.

A = highest weight (i.e. 5 in this case)

N= total number of responses

## 2. Weighted Average Index Method

Calculation of these Data on these tables were analyzed by a weighted average was calculated

$$WAI = (W_i * X_i) / N$$

$W_i$  is the weight assigned to the  $i^{\text{th}}$  option;

$X_i$  is the number of respondents who selected the  $i^{\text{th}}$  option;

$N$  is the total no. of respondents

## 3. Spearman's Rank Correlation

Calculation of these Data on these tables were analyzed by a weighted average was calculated

$$R = 1 - [(6 \sum D^2) / N(N^2 - 1)]$$

Where,

$R$  = spearman's rank correlation coefficient,

$N$  = Refers to the number of pairs of observation,

$D$  = represents the difference between the pair of same individual in two corresponding rank characteristics ( $D = R_1 - R_2$ )

### i) Relative Important Index Method (RII)

Sr no.	Delay Category	RII BY CLIENT	RII BY ENGINEER	RII BY CONTRACTOR	AVERAGE OF RII	RANK
1	Non experience staff.	0.49	0.53	0.55	0.52	14
2	Shortage of labor	0.47	0.52	0.44	0.47	18
3	Delay in crisis	0.72	0.64	0.66	.67	01
4	Construction Mistakes & Defective work	0.58	0.53	0.52	0.54	08
5	Poor site Management	0.55	0.54	0.55	0.54	08
6	Sudden Increase of material cost	0.63	0.60	0.66	0.63	02
7	Sudden Increase of fuel cost	0.43	0.60	0.52	0.51	15
8	Sudden Increase of labor cost	0.47	0.62	0.56	0.55	07

9	Design error	0.56	0.47	0.44	0.49	16
10	Delay in Payment	0.52	0.52	0.57	0.53	12
11	Sudden undefined etc. work	0.53	0.61	0.64	0.59	05
12	Quality Assurance	0.50	0.50	0.48	0.49	16
13	Site dispute	0.49	0.59	0.51	0.53	12
14	Unforeseen ground Condition	0.52	0.57	0.55	0.54	08
15	Operation & maintenance cost of equipments	0.44	0.61	0.57	0.54	08
16	Political pressure	0.58	0.63	0.64	0.61	04
17	Misconduct with client or contractor or engineer	0.63	0.60	0.63	0.62	03
18	delay in sanctioning of money by company or government	0.55	0.60	0.62	0.59	05

ii) **Weighted Average Index Method**

Sr no.	Delay Category	WAI BY CLIENT	WAI BY ENGINEER	WAI BY CONTRACTOR	AVERAGE OF WAI	RANK
1	Non experience staff.	2.23	2.68	2.77	2.56	14
2	Shortage of labor	2.38	2.63	2.22	2.41	17
3	Delay in crisis	3.84	3.22	3.33	3.46	01
4	Construction Mistakes & Defective work	2.92	2.68	2.61	2.73	09
5	Poor site Management	3.15	2.72	2.77	2.88	07
6	Sudden Increase of material cost	3.15	3.04	3.32	3.17	03
7	Sudden Increase of fuel cost	2.23	3.18	2.61	2.67	11
8	Sudden Increase of labor cost	2.38	2.00	2.83	2.40	18
9	Design error	2.84	2.36	2.22	2.47	15
10	Delay in Payment	2.61	2.63	2.87	2.70	10
11	Sudden undefined etc. work	2.69	3.09	3.23	3.00	06

12	Quality Assurance	2.53	2.31	2.44	2.42	16
13	Site dispute	2.46	2.81	2.56	2.61	13
14	Unforeseen ground Condition	2.61	2.86	2.77	2.74	08
15	Operation & maintenance cost of equipments	2.00	3.04	2.89	2.64	12
16	Political pressure	2.92	3.18	3.20	3.10	04
17	Misconduct with client or contractor or engineer	3.38	3.00	3.16	3.18	02
18	delay in sanctioning of money by company or government	2.92	3.04	3.11	3.02	05

## VII. RESULT AND DISCUSSION

### Spearman's Rank Correlation between Client and Engineer

Sr no.	Delay Category	Rank by Client (R1)	Rank of Engineer (R2)	Diff. ( $\Sigma D$ )	Diff. <sup>2</sup> ( $\Sigma D^2$ )
1	Non experience staff.	10	12	-02	04
2	Shortage of labor	13	14	-01	01
3	Delay in crisis	01	01	0	0
4	Construction Mistakes & Defective work	18	12	-06	36
5	Poor site Management	08	11	-03	09
6	Sudden Increase of material cost	03	05	-02	04
7	Sudden Increase of fuel cost	15	10	05	25
8	Sudden Increase of labor cost	14	16	-02	04
9	Design error	13	18	-05	25
10	Delay in Payment	10	14	-04	16
11	Sudden undefined etc. work	09	04	05	25
12	Quality Assurance	12	17	-04	16
13	Site dispute	17	10	07	49
14	Unforeseen ground Condition	07	09	01	01

15	Operation & maintenance cost of equipments	06	05	01	01
16	Political pressure	04	02	03	09
17	Misconduct with client or contractor or engineer	02	08	-06	36
18	delay in sanctioning of money by company or government	05	05	0	0

**$\Sigma D^2$  220**

**Spearman's Rank Correlation result is 0.772, Hence the value is near by 1 so result is Reliable**

### **Spearman's Rank Correlation between Client and Contractor**

Sr no.	Delay Category	Rank by Client (R1)	Rank of Engineer (R2)	Diff. ( $\Sigma D$ )	Diff. <sup>2</sup> ( $\Sigma D^2$ )
1	Non experience staff.	10	10	0	0
2	Shortage of labor	13	17	-04	16
3	Delay in crisis	01	01	0	0
4	Construction Mistakes & Defective work	18	13	-05	25
5	Poor site Management	08	10	-02	04
6	Sudden Increase of material cost	03	01	-02	04
7	Sudden Increase of fuel cost	15	13	-02	04
8	Sudden Increase of labor cost	14	09	-05	25
9	Design error	13	17	-04	16
10	Delay in Payment	10	07	-03	09
11	Sudden undefined etc. work	09	03	-06	36
12	Quality Assurance	12	16	-04	16
13	Site dispute	17	15	02	04
14	Unforeseen ground Condition	07	10	-03	09
15	Operation & maintenance cost of equipments	06	7	-01	01
16	Political pressure	04	03	01	01
17	Misconduct with client or contractor or engineer	02	05	-03	09
18	delay in sanctioning of money by	05	06	-01	01

	company or government				
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$$\Sigma D^2 = 184$$

**Spearman's Rank Correlation result is 0.810,**

**Hence the value is near by 1 so result is Reliable**

### **Spearman's Rank Correlation between Contractor and Engineer**

Sr no.	Delay Category	Rank by Client (R1)	Rank of Engineer (R2)	Diff. ( $\Sigma D$ )	Diff. <sup>2</sup> ( $\Sigma D^2$ )
1	Non experience staff.	10	12	-02	04
2	Shortage of labor	17	14	-03	09
3	Delay in crisis	01	01	0	0
4	Construction Mistakes & Defective work	13	12	01	01
5	Poor site Management	10	11	-01	01
6	Sudden Increase of material cost	01	05	-04	16
7	Sudden Increase of fuel cost	13	10	03	9
8	Sudden Increase of labor cost	09	16	-07	49
9	Design error	17	18	01	01
10	Delay in Payment	07	14	07	49
11	Sudden undefined etc. work	03	04	-01	01
12	Quality Assurance	16	17	-01	01
13	Site dispute	15	10	05	25
14	Unforeseen ground Condition	10	09	01	01
15	Operation & maintenance cost of equipments	7	05	02	04
16	Political pressure	03	02	01	01
17	Misconduct with client or contractor or engineer	05	08	-03	09
18	delay in sanctioning of money by company or government	06	05	-01	01

$$\Sigma D^2 = 183$$

**Spearman's Rank Correlation result is 0.811,**

**Hence the value is near by 1 so result is Reliable**

## VIII. Conclusion

On the basis of my work and studying of many review paper and also talking with different people, if there is lack of coordination between client, contractor and Engineer, there should be 90% of changes of work delay should not be happen in Road constructions.

It can seem result of spearman Rank correlation between client and Engineer is 0.772, Client and Contractor is 0.810 and Contractor and Engineer are 0.811. This means that there is a positive spearman's rank correlation in the views of client, Engineer and contractor which is coming about 0.797 that means correlation between them is almost same.

There should be several change to done in Road construction to improved delay in cost overrun elements in road construction. In India there are huge amount labour are available but these labour are not trained well these required training and also using of machine to be available in road construction to used them properly.

Some factors are should be always in mind before to minimize delay factor, Training courses and workshops should be conducted to improve managerial skills of project participants, Progress payment should be paid on time, Method to be handle it if sudden occur, Always have proper planning before conduction any plan related any field of work and always ready for any pandemic condition such as (climate change, virus attack).

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