

REWORK FACTORS AFFECTING COST AND SCHEDULE PERFORMANCE IN CONSTRUCTION PROJECT.

MISTRY SHARVILKUMAR BHARATBHAI¹, PROF. JAYRAJ V. SOLANKI²

¹M.Tech Student, Department of Civil Engineering, Ganpat University, Gujarat, India

² PG Head, Ganpat University, Gujarat, India

Abstract:-

Rework is major affect a construction project. The rework affects like... delay in project, money loss. The data are collected from question survey, books and literature review. The conclusion was the research the various factors are affecting a construction project. These factors are deviled in deferent groups like... client related factors, design related factor, and government related factor are affect the construction project.

After collect data than analysis the data from RII method. Some major causes are more affect the project like... design change, money problem, and poor supervision, government rule change, weather condition are bed, any type of external factors, human related factor all are major affect in overall project.

Introduction: -

Construction time many factors are effect in construction project. Like Money, material, tanning time and construction design and many more... it's also need as doing something a minimum of one additional time because of non-conformance to requirements. Rework may be a silent consumer of your time, resources and trust. Most important part redoing any construction activity involve factors are design and communication between designer and engineers. So if any construction Activity starts fast checks all documents and communicate with fast designer than start construction activity.

Fast rework of construction means if any construction activity is completed than realize some changes in design and some specific materials are use in construction activity so than rework this activity so this effect in time , money and material loss . It's all meaning of rework in construction project. Some time big mistake in construction work fault of any factor like design, materials and money arrangement on construction time, hazard in labor team members, any external factor like fuel, wood , Neal, plywood are not present in stock so it is effect in construction work and time duration. This is all about the rework in construction activity.

Objective: -

1. Analysis the rework factor and divide in different groups.
2. Check the effect of rework in construction project.
3. To find out effect of cost and time due to rework in construction project.

Literature Review:-

Mahesh kumar, ramesh shinde (2016) :-

Paper concentrates on the importance of supervision within the construction project. In any construction work most importance part is proper supervision of construction activity. If organization is work on proper supervision of construction and note all completed work in day. So reduce the rework in construction project and also save time, money and give the batter quality of work to customer.

L.O. Oyewobi, B.O. Ganiyu(2011):-

In this paper are divide a construction rework in two parts.

1. Fresh building
2. Old building

1. Fresh building: - fresh building means any rework construction in new construction building work. If any fresh building to do rework of construction activity due to factors like change in design and any mistake ongoing construction work .so it is not more costly if not big mistake in construction.
2. Old building: - Old building means any rework in old time constructed building. Any old building to construction is more costly to the fresh building. And more time consume to compeer to the new building work.

Adnan enshassi (2017):-

After study these papers and question survey throw realize the many factors are effect in rework construction. And they are dived in groups like Government related, environment related, Human related, money related, materials related, design related, owner related and many more factors are effect in rework construction .

Ekambaram palaneeswaran (2006)

In this paper the aim of author is to realize the important rework items and causes of rework in construction project.

In paper rework reduce help of all construction activity and save time and money on work. The reduce rework throw like before start work meet the design team and collect the data about work than check the condition of work than start the work . Finish work than check all work are good or not and check data than data sand the project manager. So these types we are reduce rework in construction and save time and money both and batter quality achieve.

Peter E.D. (2010)

Aim of paper is to realize information about the rework in construction project. Questionnaire based analysis was understanding the result.

The paper conduct that significant predictors contribute for deviations in rework cost are given below:-

1. Ineffective use of software example. - Auto Cad, Microsoft project
2. Amount of client involvement
3. Undefined working procedures.

Peter E.D. (2016):-

In paper author highlights the underlying acts of causing rework in civil project in line with author the theoretical studies available about the rework are limited and thus theoretical concepts associated with causation of rework must be future research in order that this could increase the skill to search out the answer of the issues that are arising in construction project.

Data Collection:-

The study of the Rework factors affect cost and time in construction project. The data are collected throw question survey. Divide the question survey in a deferent construction organization like Krishna construction, well found construction and akashar construction. The question survey is dividing in organization project managers, project engineers, and site engineers, contractors to collect the data for research and analysis the data. The question in the organization fast name of the company? Experience of work? Which position you are in? And question type are agree or disagree and yes or no, and point scale (1to5).The survey throw realize the many factors are effete in rework construction activity.

Ask some question about rework construction project to project managers, site engineer like... which factors are effect in rework? And can rework are costly? And rework reduces or not? Etc type question as to the organization. They give answer are very deferent many factor are affect in rework construction activity like...problems in design, material are not available in stock , money are not available for perches the material , and also government are involve in rework construction like ... road are extend, some change in plan approval .

Environment also affects in rework construction like...earthquake, rainfall, and wind storm all are damage to the building than rework of the construction. All are affecting to the cost and time schedule.

This study involves the reduce the rework in overall construction projects. Some research forms literature review, books, and question survey. 5 major groups and 15 main factors involves in rework construction project. The all data are collect.

The question asks and answers are collect for data analysis. The average answer percentage rate is 50%. This answer percentage rate is the part of the research.

Sample size:-

$$\text{Sample Size} = (Z^2 * P *(1-P)) / C^2$$

Value put in formula

Z = 85%

P=50%

E = 5%

N= 208

Where,

Z = Z score which is determined based on confidence level.

P = Population proportion

C = Margin of error

New Sample Size = $SS / (1 + [(SS-1) / Population])$

= $208 / (1 + [(208-1) / 80])$

= 80

Finally we have to determine a sample size of 80.

The owner, contractor and consultant are all involves in construction industry. The response involves throw survey and handles the many projects in organization.

The characteristics of the respondents who participated within the survey are summarized in table 1

Table I identify that major of the respondents 50% are working with contractors' organization. Show in table of respondents.

**TABLE I
 RESPONDENTS DEMOGRAPHICS**

Parameter	Frequency	Percentage (%)
Type of organization		
Contractor	27	50
Consultant	22	33
Owner	18	20
Type of projects		
Residential and commercial projects	35	50
Infrastructure projects	19	20
Industrial projects	13	30

Data Analysis:-

No	Factors	Group
1	Poor knowledge about engineering. Detail collection of measurement is poor. Poor Communication between design team and engineers. Design mistake.	Design related
2	Do not Proper arrangement of money Coordination with design consultants Understanding of design. Mind change during construction time.	Client related
3	Do not use proper construction technique Low quality of construction materials Poor supervision on construction site. Poor condition of construction equipments.	Contractor related
4	Change the government rule like... Road extends and any other. Poor site condition, earthquake, windstorm, rainfall	Environment & Government

Relative Important Index (RII):- The question survey throws collect data and analysis the data using RII method.

$$RII = \frac{\sum WA}{N}$$

Where,

RII= relative importance index.

W = given to every factor by the respondents (ranging 1 to 5)

A=highest weight (i.e.5)

N= response

Causes of your time overruns: -

Causes of time overruns is the deferent causes are taken more time. Collect the data from the question survey add response to the table response is involves the deferent organization members like... contractor, engineer, and owner show in table II .In this table show the 5 mean factors are involves in causes time of overrun. Productivity of labor, collect survey data before design, increase motivation and moral of labor, money flow during construction work and material deliver on regular time. Productivity of labor is high point scale is 5 and all respondent are agree.

Because the many reason affect in productivity of labor like... temperature high in summer, health problem during work, so this time labor productivity is less. Collect survey data before design is point scale is 4 all respondent are agreed. Because the proper survey data are not collected on time it is affect in time duration and delay the project.

TABLE II
RANKING OF CAUSES OF TIME OVERRUNS

NO	Factor	Group	RII	Point Sale (1 to 5)
1	Productivity of labour	Labor	0.88	5
2	collect survey data before design	Design	0.88	4
3	Increase motivation and moral of labour	Labor	0.85	3
4	Money flow during construction	Owner	0.85	2
5	Delivery of material on time	Material	0.84	3
6	Clear and details in drawings	Design	0.83	4
7	Use design software	Design	0.82	4
8	Regular presence of consultant's site staff	Consultant's Responsibility	0.81	3
9	Understanding of owner's requirements by design engineer	Design	0.84	4
10	High quality of Material	Material	0.88	4
11	Availability of equipment	Equipment	0.78	3
12	Skills of staff on site	Contractor's Responsibility	0.74	2
13	Reviewing and approving design documents	Owner's Responsibility	0.78	2
14	Use high efficiency of equipment.	Equipment	0.81	4
15	maintenance of equipment on time	Equipment	0.88	3
16	Modern equipment use	Equipment	0.87	4
17	Material suppliers	Material	0.86	3
18	Batter quality of Material	Material	0.75	3
19	proper project design	Design	0.78	3
20	Agreement between contractor and consultant	Consultant's Responsibility	0.68	3

Causes of cost overruns: -

Causes of cost overruns are the deferent causes are taking more costly. Some construction factors are more costly. Collect the data from the question survey add response to the table response is involves the deferent organization members like... contractor, engineer, and owner show in table III. In this table show the 5 mean factors are involves in causes cost of overrun. Money inflow or outflow, add work request form owner and high transportation cost .all data analysis form RII method use. The transportation point scale is 4. It is high because material transport distance is long to the site location so transportation cost is high. Respondent are agree some time transportation cost is high depend on material location to site location distance.

The causes of cost overrun price of material are very main factor because material price is change with time. So buy a stock of material on time. The Five-point scale of 1 to 5. It's categorized as follows 5=very high, 4=high, 3=medium, 2=low, and 1=very low.

**TABLE III
CAUSES OF COST OVERRUNS**

Rank	Factor	Group	RII	Point Scale (1 to 5)
1	Rework	Construction parties	0.85	5
2	material price	Material	0.98	4
3	Additional work	Owner	0.78	4
4	Cost of transportation	Equipment	0.87	4
5	planning and scheduling	Design	0.85	4
6	productivity of Labour	Labor	0.88	3
7	Use of equipment.	Equipment	0.75	4
8	consultant and design engineer	Design	0.78	3
9	Lack of information between parties	Construction parties	0.84	4
10	Availability of equipment	Political Regulation	0.85	3

Conclusion:-

Rework is major affect construction project. The rework affects like... delay in project, money loss. The data are collected from the question survey, books and literature review. The conclusion was the research the various factors are affecting construction project. These factors are deviled in deferent groups like... client related factors, design related factor, and government related factor are affect the construction project. After collect data than analysis the data from RII method. Some major causes are more affect a project like... design change, money problem, and poor supervision, government rule change, weather condition are bed, any type of external factors, human related factor all are major affect in overall project. After all data analysis then we found the 10-20% cost of the project is the rework cost. And 5-10% is affected on-time duration rework construction. According to the questionnaire survey.

Future scope:-

The rework factors affect cost and time topic continues the analysis of the problems related to this topic. The Future scope of the project is the reduce rework construction projects and better quality of work and save time and money on project. In case future deep study on the factors and reduce the rework in the project. And analysis the all members are work on

together like... communicate between design team and engineers. And also a proper condition of material and equipment on site.

Reference:-

1. Journal of Quality & Reliability Management, Vol. 15 Issue: 3, pp.329-349,
<https://doi.org/10.1108/02656719810198926>
2. Mahamid I.(2016). Analysis of Rework in Residential Building Projects in Palestine. Jordan Journal of Civil Engineering, Volume 10, No. 2.pp 197-208.
3. Fellows, R. R.; Liu, A. (2008) Research Methods for Construction, 3rd Edition. Wiley- Blackwell Science, London.
4. Elinwa, AU, and Joshua, M (2001). "Time overrun factors in Nigeria construction industry", J. Constr. Engr. Mgt., 127(5): 419-25.
5. Love, P. E. D., Mandal, P. and Li, H. (1999), determining the causal structure of rework in construction projects, Construction Management and Economics, 17 (4): 505-517.