

# Critical Factors Affecting Construction Cost In Albania

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**Abstract** - The growing need for construction of all types coupled with a tight monetary supply has provided the construction industry with a big challenge to cut the cost.

Construction cost is influenced by several factors, therefore is more important to asses and ranks the most cost- influencing factors on construction cost.

A detailed review of such factors as “Slow payment of completed works”, “Cash flow and financial difficulties faced by contractors”, “Frequent design changes” and “Incompetent Project team “and others are considered in this paper.

Factors affecting construction cost are identified through literature review and interviews. This paper presents the results of a questionnaire survey conducted among contractors, designer and project managers.

Data was analyzed with PASW statistical program, version18.

From the results, the respondents ranked “Slow payment of completed works”, “Cash flow and financial difficulties faced by contractors”, “Frequent design changes” and “Incompetent Project team “(designers and contractors) extremely high compared to other causes, while “Shortages of materials”, “Shortage of site workers” are least affecting factors on construction cost. These conclusions are comparable to findings from other similar researches conducted in other countries.

**Keywords:** Design, Cost Estimate, Construct, Procurement

## 1. INTRODUCTION

In Albania like other countries construction industry is one of major industry contributing significantly in the growth of socio-economic development.

Although in Albania a lot of money has been spent in construction, the industry is facing a lot of challenges such as the expenditure exceeding the budget, delay to complete the project in time, the building defects and over dependent of foreign workers (CIDB, 2007).

Achieving project completion on time and within budget at specified quality standards is major criterion of success of project (NEDO, 1988).Studies show that rarely projects are completed within stipulated budget.

In Project Management Body of Knowledge (PMBOK) a project is defined as “a temporary endeavor undertaken to create a unique product, service or result (Project Management Institute, 2008). For the professionals of construction project management are three words:”scope, schedule, budget”, which define the borders of construction project.

The scope has defined start and end dates (schedule) and has funding limits (budget). Since budget and schedule are the main project constraints to be worked with, any estimation concerned with cost and duration are very helpful in the early stages of construction project management process.

Also construction cost estimation can be defined as “an effort to forecast the actual cost”. Cost estimations can be done in any stage of the project. When the project delivery stages of a construction project are considered, the process can be summarized in 6 different stages:

1. Feasibility Stage
2. Conceptual Stage
3. Engineering
4. Procurement
5. Construction
6. Turnover

Preliminary drawings and specifications are the only sources that can be used in conceptual cost estimation. For an accurate estimate, detailed scope definition is essential. At the early stages of a construction project the design information and scope definitions are very limited, hence achieving high accuracy is very difficult.

However, most of the significant factors affecting costs are identified from literature review and interview such as, “Cash flow and financial difficulties faced by contractors”,

”Incorrect planning and scheduling by contractors”, “Procurement methods”, ”Market conditions”, “Unit cost of building”, “Cost overrun”, “The expenditure exceeding the budget”, “Delay to complete the project in time”, “Defects during construction”. Due the qualitative nature of these factors, they are difficult to structure and quantify. Despite their importance, most of these factors are often ignored by current forecasting techniques.

**Objective of the study** is to asses and ranks the most cost-influencing factors on construction cost in Albania.

## 2. LITERATURE REVIEW

**Okpala and Aniekwu** investigated causes of high costs of construction in Nigeria. The study revealed 27 factors contributing to high cost and delays in completion time. A questionnaire survey was conducted which included engineers, architects and quantity surveyors. The top ranked factor was identified as price fluctuations. The factors identified in this study are largely influenced by the locality of the country in which the research was conducted (Okpala & Aniekwu, 1988).

**Elinwa and Buda** investigated construction costs factors in Nigeria. A questionnaire survey was conducted, which involved architects, engineers and quantity surveyors. Thirty-one variables were assessed and analyses of results showed good arguments between responses. The top ranked factors, which contributed to construction cost included, cost of materials, fraudulent practices and fluctuation in prices of materials (Elinwa and Buda, 1993).

**Memon and Rahman** investigated the factors affecting construction cost in large projects was carried out. Results showed that “Cash flow and financial difficulties faced by contractors”, “Contractor's poor site management and supervision”, “Inadequate contractor experience”, “Shortage of site workers” and “Incorrect planning and scheduling by contractors” were more significant factors affecting construction cost. (Memon & Rahman, 2010).

**In Ghana** studies 26 factors that cause cost overruns in construction of ground water projects in Ghana. According to the contractors and consultants, monthly payments difficulties was the most important cost overruns factor, while owners ranked poor contractor management as the most important factor. Despite some difference in viewpoints among the three groups surveyed, there is a high degree of agreement among them with respect to their ranking of the factors. The overall ranking results indicate that the three groups felt that the major factors that can cause excessive groundwater project

cost overruns in developing countries are poor contractor management, monthly payment difficulties, material procurement, poor technical performances and escalation of material prices (Y. Frimpong, (2003).

### The cost- influencing factors on construction cost

Cost is among the major considerations throughout the project management life cycle and can be regarded as one of the most important parameters of a project and the driving force of project success. Despite its proven importance it is not uncommon to see a construction project failing to achieve its objectives within the specified cost. Therefore is more important to asses and ranks the most cost- influencing factors on construction cost. From study and worked related are identified and selected 27 factors which are summarized:

1. Incorrect planning and scheduling by contractors
2. Fluctuation in prices of materials
3. Frequent design changes
4. Unforeseen ground conditions
5. Shortages of materials
6. Expropriation problems
7. Political problems
8. Inadequate contractor experience
9. Change in the scope of the project
10. Low speed of decisions making
11. Cash flow and financial difficulties faced by contractors
12. Contractor's poor site management and supervision
13. Practice of assigning contract to lowest bidder
14. Lack of communication among parties
15. Shortage of site workers
16. Delay in Material procurement
17. Owner interference
18. Equipment availability and failure
19. Labor productivity
20. Mistakes during construction
21. Social and cultural impacts
22. Underestimate project
23. Duration resulting Schedule Delay
24. Incompetent Project team (designers and contractors)
25. Necessary variations of works
26. Poor technical performance
27. Slow payment of completed works

### Concluding remarks

From the literature more significant factors affecting construction cost were ”Design, drawings, specification, working relationship with parties, variation orders and

additional works, quality of design and specifications, inspection, testing and approval of completed works, submission of early proposals for costing(cost planning), absence of alterations and late changes to design, cash flow and financial difficulties faced by contractors, contractor's poor site management and supervision, inadequate contractor experience, incorrect planning and scheduling by contractors, price fluctuations, fraudulent practices, cost of materials “.

### 3. RESEARCH METHODOLOGY

A questionnaire methodology was adopted to assess and rank cost-determinants in existent construction cost modeling used in the preparation of cost planning. Survey and interviews were distributed among contractor, firms, engineers and project management consultants. It focused in design projects, control projects, methods of building procurement, construction site and included almost all types of projects. Data collected through questionnaire survey was analyzed with PASW statistics program, version 18.

From study and worked related were identified and selected 27 factors which are summarized:

1. Incorrect planning and scheduling by contractors
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26. Poor technical performance
27. Slow payment of completed works

### Conducting questionnaire survey through postal mail and personal interviews

Questionnaire survey and interviews were distributed among contractor, firms, engineers and project management consultants through postal mail and personal interviews. It focused in design projects, control projects, methods of building procurement, construction site and included almost all types of projects in construction. A total of 150 questionnaires were distributed out of which 28 with a percentage 18.7% were received.

For assessing the degree influence of each factors of questionnaire a scale is used as follows:

1. strongly disagree;
2. disagree;
3. moderately agree;
4. agree;
5. strongly agree

### The processes are involved in cost estimating model

Based on Part 1 of the British Standard BS 6143 (BSI, 1992), a generic process cost model for a construction process is presented in Figure 1.

Process approach is one of the eight quality management principles incorporated in the ISO 9000:2000 quality standard. The Standard also emphasizes the importance of continual improvement of processes.

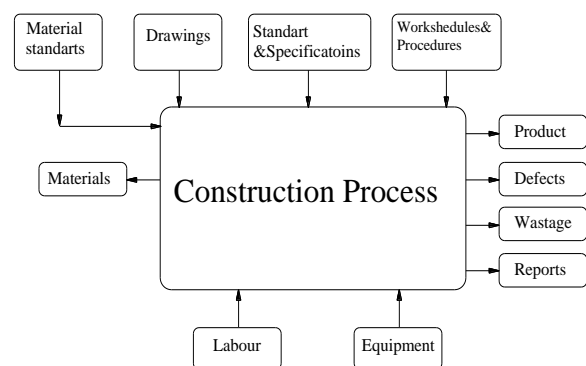


Figure : Typical Construction Process Cost Model

Cost estimating is one of the most important steps in project management. A cost estimate establishes the base line of the project cost at different stages of development of the project. A cost estimate at a given stage of project development represents a prediction provided by the cost engineer or

estimator on the basis of available data. More specifically, the management decisions supported by cost models include:

- Forecasting the total cost of construction
- Comparing design alternatives
- Forecasting the economic effects upon society of changes to design codes and regulations

#### **Factors influencing the choice of cost model.**

Many factors influence of cost model. Some of them are mention below:

1. Information and time available;
2. Experience of the estimator /quantity surveyor;
3. The amount and the form of cost data;
4. Purpose of the estimates;
5. Techniques to be adopted ;

Cost estimate can be done in any stage of the project. A construction project is considered in 6 different stages:

1. Feasibility stage
2. Conceptual stage
3. Design stage
4. Procurement
5. Construction
6. Turnover

Conceptual cost estimation is performed in conceptual stage detailed design is completed. In conceptual stage, the preliminary design of the project has been finished. Preliminary drawings and specifications are the only sources that can be used in conceptual cost estimation. At the early stages of a construction project the design information and scope definitions are very limited, hence achieving high accuracy is very difficult.

#### **Stages of cost estimates in construction industry**

Construction cost constitutes only a fraction, though a substantial fraction, of the total project cost. However, it is the part of the cost under the control of the construction project manager. The required levels of accuracy of construction cost estimates vary at different stages of project development, ranging from ball park figures in the early stage to fairly reliable figures for budget control prior to construction. Since design decisions made at the beginning stage of a project life cycle are more tentative than those made at a later stage, the cost estimates made at the earlier stage are expected to be less accurate. Generally, the accuracy of a cost estimate will reflect the information available at the time of estimation.

Construction cost estimates may be viewed from different perspectives because of different institutional requirements. In spite of the many types of cost estimates used at different stages of a project, cost estimates can best be classified into three major categories according to their functions. A construction cost estimate serves one of the three basic functions: design, bid and control. For establishing the financing of a project, either a design estimate or a bid estimate is used.

**Design Estimates.** For the owner or its designated design professionals, the types of cost estimates encountered run parallel with the planning and design as follows:

- Screening estimates (or order of magnitude estimates)
- Preliminary estimates (or conceptual estimates)
- Detailed estimates (or definitive estimates)
- Engineer's estimates based on plans and specifications

For each of these different estimates, the amount of design information available typically increases. In the planning and design stages of a project, various design estimates reflect the progress of the design. At the very early stage, the screening estimate or order of magnitude estimate is usually made before the facility is designed, and must therefore rely on the cost data of similar facilities built in the past. A preliminary estimate or conceptual estimate is based on the conceptual design of the facility at the state when the basic technologies for the design are known. The detailed estimate or definitive estimate is made when the scope of work is clearly defined and the detailed design is in progress so that the essential features of the facility are identifiable. The engineer's estimate is based on the completed plans and specifications when they are ready for the owner to solicit bids from construction contractors. In preparing these estimates, the design professional will include expected amounts for contractors' overhead and profits.

The costs associated with a facility may be decomposed into a hierarchy of levels that are appropriate for the purpose of cost estimation. The level of detail in decomposing the facility into tasks depends on the type of cost estimate to be prepared. For conceptual estimates, for example, the level of detail in defining tasks is quite coarse; for detailed estimates, the level of detail can be quite fine.

**Bid Estimates.** For the contractor, a bid estimate submitted to the owner either for competitive bidding or negotiation

consists of direct construction cost including field supervision, plus a markup to cover general overhead and profits. The direct cost of construction for bid estimates is usually derived from a combination of the following approaches.

➤ Subcontractor quotations

. Some contractors have well established cost estimating procedures while others do not. Since only the lowest bidder will be the winner of the contract in most bidding contests, any effort devoted to cost estimating is a loss to the contractor who is not a successful bidder. Consequently, the contractor may put in the least amount of possible effort for making a cost estimate if it believes that its chance of success is not high.

If a general contractor intends to use subcontractors in the construction of a facility, it may solicit price quotations for various tasks to be subcontracted to specialty subcontractors. Thus, the general subcontractor will shift the burden of cost estimating to subcontractors. If all or part of the construction is to be undertaken by the general contractor, a bid estimate may be prepared on the basis of the quantity takeoffs from the plans provided by the owner or on the basis of the construction procedures devised by the contractor for implementing the project. For example, the cost of a footing of a certain type and size may be found in commercial publications on cost data which can be used to facilitate cost estimates from quantity takeoffs. However, the contractor may want to assess the actual cost of construction by considering the actual construction procedures to be used and the associated costs if the project is deemed to be different from typical designs. Hence, items such as labor, material and equipment needed to perform various tasks may be used as parameters for the cost estimates.

**Control Estimates.** For monitoring the project during construction, a control estimate is derived from available information to establish:

- Budget estimate for financing
- Budgeted cost after contracting but prior to construction
- Estimated cost to completion during the progress of construction

Both the owner and the contractor must adopt some base line for cost control during the construction. For the owner, a budget estimate must be adopted early enough for planning

- Quantity takeoffs
- Construction procedures

The contractor's bid estimates often reflect the desire of the contractor to secure the job as well as the estimating tools at its disposal

long term financing of the facility. Consequently, the detailed estimate is often used as the budget estimate since it is sufficient definitive to reflect the project scope and is available long before the engineer's estimate. As the work progresses, the budgeted cost must be revised periodically to reflect the estimated cost to completion. A revised estimated cost is necessary either because of change orders initiated by the owner or due to unexpected cost overruns or savings.

For the contractor, the bid estimate is usually regarded as the budget estimate, which will be used for control purposes as well as for planning construction financing. The budgeted cost should also be updated periodically to reflect the estimated cost to completion as well as to insure adequate cash flows for the completion of the project.

#### 4. RESULTS AND ANALYSIS

This chapter is dedicated to the results and analysis of data collected. It consists in analysis of respondent profile, advantages and disadvantages of the cost modeling techniques, assessing and ranking of factors which influence in construction cost and concluding remarks.

##### **Respondent Profile**

The results indicates the majority (almost 100%) possess a high level of academic qualification; i.e. degree holders. Majority covers a spectrum of high ranking personnel in which (81%) of the respondents belong to the top management level, such as director, principal, managing here director, etc. Therefore, the information provided by the respondents can be considered as reliable and authoritative. Majority of terms involved in questionnaire are described as below:

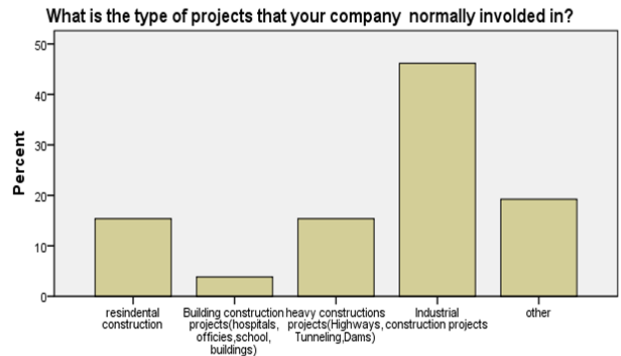
##### **The job position**

Distribution of respondents in terms of job position is shown in tab.2. The majority of respondents are classified as below:



**What is your job position?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Project manager	5	18.5	19.2	19.2
	Investor	2	7.4	7.7	26.9
	Project designer	13	48.1	50.0	76.9
	Executive engineer consultant	2	7.4	7.7	84.6
		4	14.8	15.4	100.0
	Total	26	96.3	100.0	
Missing	System	1	3.7		
Total		27	100.0		



Bar chart the types of projects



**Data collected**

**Ranking of factors affecting construction cost**

Data collected through questionnaire survey was analyzed with PAWS 18 to identify the significant factors affecting construction cost. The respondents were asked to evaluate and rank the listed factors. The results are shown in Table.10 as below:

Table :Preliminary and Ranking Factors affecting Construction cost

No	Causes	Mean	S.D
1	Incorrect planning and scheduling by contractors	3.43	1.345
2	Fluctuation in prices of materials	3.36	1.162
3	Frequent design changes	3.75	1.076
4	Unforeseen ground conditions	3.29	1.013
5	Shortages of materials	2.21	1.343
6	Expropriation problems	3.50	1.072
7	Political problems	3.18	1.416
8	Inadequate contractor experience	3.36	1.062
9	Change in the scope of the project	2.96	1.427
10	Low speed of decisions making	3.26	1.295
11	Cash flow and financial difficulties faced by contractors	3.75	1.206
12	Contractor's poor site management and supervision	3.04	1.201
13	Practice of assigning contract to lowest bidder	3.54	0.999
14	Lack of communication among parties	3.00	1.247
15	Shortage of site workers	2.39	1.315
16	Delay in Material procurement	2.93	1.245
17	Owner interference	3.11	1.257
18	Equipment availability and failure	2.86	1.208
19	Labor productivity	3.04	1.232
20	Mistakes during construction	2.82	1.278
21	Social and cultural impacts	2.75	1.206
22	Underestimate project	3.32	1.467
23	Duration resulting Schedule Delay	3.21	0.957
24	Incompetent Project team (designers and contractors)	3.61	1.343
25	Necessary variations of works	2.93	1.184
26	Poor technical performance	3.21	0.995
27	Slow payment of completed works	3.79	1.197

Based on the results achieved in table top factors of each respondent were selected as shown in figures below:

**Practical experience working in constructions projects.**

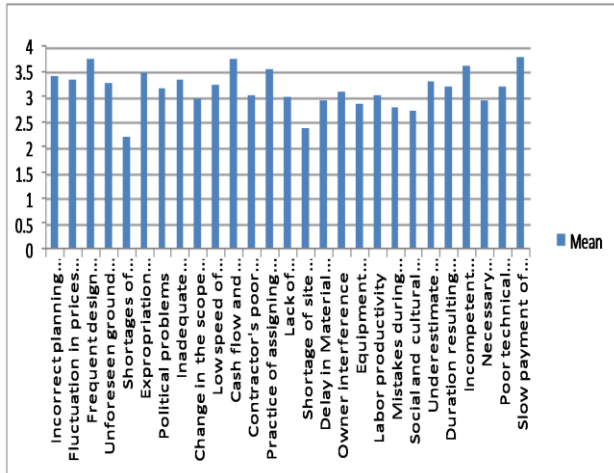
Distribution of respondents in terms experience working is shown in table 3 indicates that majority of respondent's i.e. 51.9 % were experienced less than 5 years and 22.2 % had experience between 11-15 years.

**Types of projects**

Distribution of respondents in term "type's projects" is shown in table 4 indicates that majority of respondent's i.e. 46.2 % were experienced in industrial construction.

**What is the types of projects that your company normally involved in?**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	residential construction	4	14.8	15.4	15.4
	Building construction projects (hospitals, of fices, school, buildin gs)	1	3.7	3.8	19.2
	heavy constructions projects (Highways, Tunneling, Dams)	4	14.8	15.4	34.6
	Industrial construction projects	12	44.4	46.2	80.8
	other	5	18.5	19.2	100.0
	Total	26	96.3	100.0	
Missing	System	1	3.7		
Total		27	100.0		



Ranking of factors affecting construction cost

S.No	Factors affecting construction cost	Mean	S.d	Rank
1	Slow payment of completed works	3.79	1.197	1
2	Cash flow and financial difficulties faced by contractors	3.75	1.206	2
3	Frequent design changes	3.75	1.076	3
4	Incompetent Project team (designers and contractors)	3.61	1.343	4
5	Practice of assigning contract to lowest bidder	3.54	0.999	5
6	Expropriation problems	3.50	1.072	6
7	Incorrect planning and scheduling by contractors	3.43	1.345	7
8	Fluctuation in prices of materials	3.36	1.162	8
9	Inadequate contractor experience	3.36	1.062	9
10	Underestimate project	3.32	1.467	10

Mean, SD and Ranking of factors affecting construction cost

From the figure 12 and based on table 11, the mean rank score for the “Slow payment of completed works”, “Cash flow and financial difficulties faced by contractors”, “Frequent design changes” and “Incompetent Project team (designers and contractors) is high compared to other causes. Whereas the other significant causes include “Practice of assigning contract to lowest bidder”, “Expropriation problems” as discussed below:

#### Slow payment of completed works:

The survey ranked “Slow payment of completed works” in the first place. Therefore this cause is the most significant factor affecting construction cost. They believe this issue is very critical where it may influence very much to other causes such

as “Cash flow and financial difficulties faced by contractors” and then they also “Frequent design changes” which is rank in third place is influenced from “Incompetent Project team (designers and contractors).

The real issue here is that during recently years is observed that delays of payment of completed works are increase because of financial recessions.

A government budget every year liquidates a percentage of total investment, for these reasons the construction industry has decrease in development and profits. Also, is observed that most of the industrial work liquidate with “clearing deal”.

#### Cash flow and financial difficulties faced by contractors

“Cash flow and financial difficulties faced by contractors” was ranked as second highest rank. Therefore this cause is the most significant factor affecting construction cost. The respondents believe this issue is very critical where it may influence other causes such as “Slow payment of completed works” as mention above, “Expropriation problems” and “Ineffective planning and scheduling”.

#### Frequent design changes

“Frequent design changes” was ranked as third highest rank. The respondents believe this issue is very critical where it is very link with “Incompetent Project team” (designers and contractors).

The real issue here is the lack of technical skill of project team (designers and contractors) or the lack of terms of references from investor’s.

#### Incompetent Project team

“Incompetent Project team” (designers and contractors) was ranked as 4th ranked. The respondents believe this issue is very critical where it may influence to “Frequent design changes”, “Poor technical performance” and “Inadequate contractor experience”.

The real issue here is the lack of technical skill of project team (designers and contractors) because of designers and contractors seem to hire young and inexperienced personnel there.

#### Practice of assigning contract to lowest bidder

“Practice of assigning contract to lowest bidder” was ranked as 5th ranked. The respondents believe the real issue here is highly related to “cost of project” therefore has resulted in difficulties in handling the project efficiently.

## Concluding remarks

The most insignificant factors the results indicate that “Slow payment of completed works”, “Cash flow and financial difficulties faced by contractors”, “Frequent design changes” and “Incompetent Project team “(designers and contractors) extremely high compared to other causes, while “Shortages of materials”, “Shortage of site workers” are least affecting factors on construction cost.

These phenomenons are comparable to findings from other similar researches conducted in other countries.

## 5. CONCLUSIONS

The comprehensive study to identify the factors affecting construction cost in construction project in Albania was carried out. Finally a questionnaire was developed by selecting top 10 ranked factors.

“Slow payment of completed works”, “Cash flow and financial difficulties faced by contractors”, “Frequent design changes” and “Incompetent Project team “(designers and contractors) ranked extremely high compared to other causes while “Shortages of materials”, “Shortage of site workers” are least affecting factors on construction cost.

This ranking is because these factors are influencing by financial recessions and the delays of payment of completed works are increase, the industrial work liquidate with “clearing deal” and designers and contractors seem to hire young and inexperienced personnel there.

The most of cost factors evaluated in this study don’t play a part in major database which care for construction analysis. They are considered more subjective in nature and therefore harder, costly and time consuming to be extracted as project data.

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## APPENDIX

## THE QUESTIONNAIRE

**Frequency of factors affecting construction cost**

To assess the degree of agreement of each cause where:

- 1 → represented 'strongly disagree',
- 2 → 'disagree',
- 3 → 'moderately agree',
- 4 → 'agree'
- 5 → 'strongly agree'

Causes	1	2	3	4	5
Incorrect planning and scheduling by contractors					
Fluctuation in prices of materials					
Frequent design changes					
Unforeseen ground conditions					
Shortages of materials					
Expropriation problems					
Political problems					
Inadequate contractor experience					
Change in the scope of the project					
Low speed of decisions making					
Cash flow and financial difficulties faced by contractors					
Contractor's poor site management and supervision					
Practice of assigning contract to lowest bidder					
Lack of communication among parties					
Shortage of site workers					
Delay in Material procurement					
Owner interference					
Equipment availability and failure					
Labor productivity					
Mistakes during construction					
Social and cultural impacts					
Underestimate project					
Duration resulting Schedule Delay					
Incompetent Project team (designers and contractors)					
Necessary variations of works					
Poor technical performance					
Slow payment of completed works					

If you have suggest or other cause which doesn't mention here please you can add in overview