

Laxmi Construction: Project Design Changes Rock Procurement Management

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Abstract. The performance objective of operations management is to achieve high quality, with low cost, while delivering the products on time with more flexibility. This is particularly true in the execution of infrastructure projects, where design changes are inevitable within an allowable budget. The trade-off needs to be achieved between the flexibility and on time delivery. There are many factors which affect the on-time delivery, particularly when the design changes happen during the execution of an infrastructure project. These include the hierarchical structure of the organization, planning and procurement of raw materials, and risks involved in the design changes. This case narrates a situation where a client makes frequent design changes to the specifications approved during the tendering process for an infrastructure project which resulted in project delays and cost overruns. How can a company anticipate these challenges and act accordingly to ensure that the project runs smoothly?

Keywords: frequent design change, procurement management, strategy, material management.

1. Introduction

It was August 2019, when the director of Laxmi Construction (a company that undertakes sub-contracting of construction works from builders or infrastructure management companies) was happy to win the contract as a design-build contractor for the construction of 120,000 square foot commercial building in Pune, a city in the state of Maharashtra, India. Laxmi Construction was responsible for various activities starting from design, procurement, construction, commissioning, and to the handover of the project to the client.

The client's team consisted of a chairman, and a building up-gradation committee that consists of 8 members. Each member was well versed with

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construction. The committee members were famous for frequently changing the project specifications. One member owned an air conditioning company and wanted to make sure that his company was awarded the air-conditioning work for the project. The client had secured all required permissions to begin the construction work. He had conducted a demarcation survey, contour survey, and geotechnical survey. He was thereafter pressurizing Laxmi Construction to begin the construction work as soon as possible since the monsoon was only a couple of months away. Laxmi Construction had to submit a 10-percentage advance Bank Guarantee and 10 percentage Performance Bank Guarantee which would be released after the Defects Liability period (DLP) was over.

The client had appointed an external consultant named Navkar Consultants, to check and validate the design for the project. Navkar was demanding that all project drawings, calculations, specifications, and bill of quantities (BOQ) should be completed, reviewed, and approved, before construction work could commence on site as mentioned in the tender document.

The salient features of the project were as follows –

- The building configuration is basement + 6 floors.
- The basement was 50,000 square feet with a clear height of 4.4 meters with stacked parking. It would require an artificial ventilation system.
- The ground floor and first floor had clear height of 4 meters and the remaining floors had clear height of 3.3 meters.
- There would be a showroom on the ground floor and first floor, and offices on the remaining floors.
- The entire building would be air-conditioned.
- Indian Standard, fire, and building norms were applicable.
- The total project cost for the design-build work was Rs. 30 crores (excluding land cost).
- The completion time of the project was 15 months. There was a penalty of
- Rs. 1 lakh per day for delay in completion.

- There would be a defects liability period (DLP) of 1 year from the commissioning date.

The payment was linked to the completion of work and stages of payment were as follows -

- Upon approval of the design, drawings, and Bill of Quantity (BOQ) by Navkar consultants – 25% payment
- Upon commencement of construction work – 5% payment
- Upon completion of basement floor – 20% payment
- Upon completion of the first floor – 5% payment
- Upon completion of the second floor – 5% payment
- Upon completion of the third floor – 5% payment
- Upon completion of the fourth floor – 5% payment
- Upon completion of the fifth floor – 5% payment
- Upon completion of the sixth floor – 5% payment
- Upon testing and commissioning of mechanical, electrical, fire protection, and plumbing (MEFP) systems – 10% payment
- Upon handover of project – 5% payment
- Upon receipt of occupancy certificate – 5% payment

2. Case Discussion Questions

The case discussion requires 90 minutes in total taking into consideration, the presentations that each group will make. The class should ideally be divided into 9 groups with 3 to 6 people in each group. Each group will be given one scenario to discuss and come to a consensus. The group members will be asked to make presentations on the probable solutions to the situations listed in the case. During group presentations, participants from other groups can also contribute by offering suggestions for further deliberation.

A. Prepare a site organization chart with design and procurement roles and responsibilities for Laxmi Construction for successful execution of the project.

B. Laxmi Construction met the client and understood their requirements. Based on the client's requirements, site conditions, and local jurisdictional rules, they prepared and submitted the drawings for review and approval. This process took 6 weeks. The client reviewed the drawings, responded and said that since there was a budget constraint, they would like to build only the basement and three floors for now. Laxmi incorporated this change in the drawing and resubmitted the drawings for approval. This rework of the drawings took an additional 2 weeks. During the subsequent drawing review, the client made several other changes to the drawings. These were related to changes in specifications and the addition of extra items that were not discussed before. This continued and eventually, Laxmi Construction had to redo the drawings several times before final approval. These revisions in the drawings took an additional 5 weeks.

Based on the above scenario –

1. Who was responsible for the delay caused due to the delay in the approval of drawings?
2. How would you calculate the cost of the delay?
3. How would you document the delay?
4. What provisions would have to be made to amend the contract?

C. Navkar consultants raised several questions regarding the efficiency of the design. These were specifically related to the consumption of steel per square foot. They felt that the steel consumption should be 4 kg per square foot. However, the steel consumption as per the design was 7 kg per square foot. They asked Laxmi Construction to share the design parameters, along with calculations for review. Laxmi refused to share the design parameters, and in turn, asked Navkar consultants to share their assumptions for stating the design inefficiency. This led to a delay in the drawing review and approval process by three weeks.

Based on the above scenario –

1. Who was responsible for the delay?
2. How would you calculate the cost of the delay?
3. How would you document the delay?
4. What provisions would have to be made to amend the contract?

D. MEFP (Mechanical, Electrical, Fire Protection, and Plumbing) is a key part of the design. Laxmi Construction outsourced the MEFP design work to a