

INTEGRATING TARGET COSTING AND ACTIVITY BASED COSTING IN BUILT TO SUIT PROJECT

A Thesis

Submitted in partial fulfillment of the requirements for the award of
Master of Architecture degree in Building Management

by

SAVERA.R.M (40840013)



**DEPARTMENT OF ARCHITECTURE
SCHOOL OF BUILDING AND ENVIRONMENT**

SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

Accredited with Grade "A" by NAAC

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BONAFIDE CERTIFICATE

This is to certify that this Report is the bonafide work of **SAVERA.R.M (40840013)** who carried out the Thesis entitled "**INTEGRATING TARGET COSTING AND ACTIVITY BASED COSTING IN BUILT TO SUIT PROJECT**" under our supervision from Jan 2022 to May 2022.

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SIGNATURE OF THE CANDIDATE

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ABSTRACT

The construction industry is unique in its working as compared to other manufacturing and product development industries. Since it is a project-based activity, every construction project has its own nature, requirements, and characteristics. The uniqueness of construction projects is that they are priced before being constructed. Therefore, accuracy of project estimates have a pivotal role. This is the reason that more often than not, comparison of actual cost to early cost estimates becomes the measure of the project team, performance and overall success of the project . Pricing and the profit required from the construction project are decided at the time of bidding and the bid's acceptance. Therefore, construction project managers are primarily involved in cost control. This makes it necessary for construction managers to understand different factors that influence the accuracy of project cost estimates. Based on the delay factors coefficient variation factor has been arrived in this paper.

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CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION :

Target costing is a fundamental and effective tool for managing costs and reducing the cost of products. The target costing method is just the opposite of the traditional costing method and starts with sales prices. This method helps organizations to accurately cost estimate and reduce inadequate risk of profits, and develop better and faster products. The main purpose of the target costing is to estimate costs based on the goal pursued by the organization in a competitive environment. The Activity based costing is that the activities consume resources and products consumes the activities, which focuses on managing activities rather than costs. The activity-based costing system can also be described as an allocation method of overhead costs by a cost accounting methodology based on the cost driven activity to the activity pool and cost targets. This definition indicates that project overheads can be assigned to project activities based on cost drivers. Activities can be grouped into units, batch, projects, and facility-sustaining overheads.

1.2 AIM:

To identify and analyze the factors influencing the accuracy of construction cost estimates based on Activity based costing and target costing for Built to suit projects.

1.3 OBJECTIVES AND SCOPE OF WORK :

- To study the factors influencing the accuracy of cost estimation.
- To analyze the target costing and activity based costing in construction projects.
- To study the Built to suit commercial project type costing based on their ROI and analyze the Target and activity based costing for it.
- To study the cost variation during the execution phase due to various factors.
- To compare the cost difference between Activity based and target costing and analyze the factors.

1.4 RESEARCH METHODOLOGY :

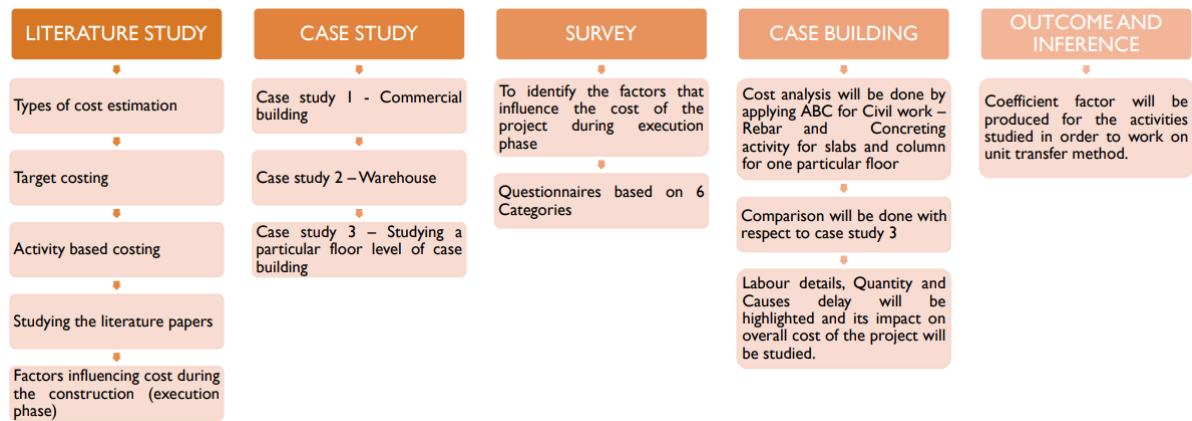


Fig 1.1: Research methodology

1.5 LIMITATIONS :

- The extent of the study is limited to towards planning and scheduling during construction phase.
- The extent of interviews and surveys is limited to Emails, phone calls and online surveys only.
- Limiting the study towards industry specific (i.e construction industry)

CHAPTER 2 LITERATURE STUDY

2.1 DIFFERENT TYPES OF COSTING METHODS :

COSTING METHODS	Job costing	Activity based costing: It is a continuous cycle process that adjusts the activities and the supply of resources of the next phase of construction project, according to the deviation between the budget cost and the actual cost
	Process costing	
	Standard costing	
	Absorption costing	
	Variable costing	
	Throughput costing	Target costing: Target costing turns costing and pricing upside-down in a sense that determination of the selling price is done first before costs are calculated. In target costing, a company performs a marketing analysis for a future product or service and estimates what selling price (target price) will provide the best return on investment. This analysis is performed with great involvement of the marketing department.
	Activity based costing	
	Target costing	
	Kaizen costing	

Fig 1.2: Different types of costing methods

2.1.1 Job costing:

Job costing is a type of management and cost accounting that allows the accumulation of costs (and revenues) for individual customer projects or jobs. This method of accounting for costs is used for management (internal) reporting purposes.

Process costing is another type of management and cost accounting that is applied in situations when companies produce large quantities (think, mass production) of homogeneous products. The goal of process costing, similar to job costing, is to allow proper cost accumulation and allocation to products.

2.1.2 Standard costing:

Standard costing is an accounting method that uses an estimate of costs instead of actual costs for recording inventory costs in manufacturing companies. When actual costing is utilized, accountants record raw material purchases, their movements to work-in-process when manufacturing starts, and subsequently, finished goods when manufacturing is completed, using actual costs of materials, labor, and overhead.

2.1.3 Absorption costing:

Absorption costing (full costing) is required to be used for external financial reporting and assumes that any inventory related (manufacturing) costs, both variable and fixed, shall be included in the cost of inventory. In other words, manufacturing costs regardless of their cost behavior are first recorded as an asset on the Balance Sheet (i.e., Raw Materials Inventory, Work-in-Process Inventory, Finished Goods Inventory) and are reported as an expense on the Income Statement (Cost of Goods Sold) when inventory is sold.

2.1.4 Throughput costing:

Throughput costing is yet another variation of inventory costing which assumes that any direct material costs are considered part of inventory costs and all other costs (including direct labor, manufacturing overhead) are considered period costs and expensed as incurred. Throughput costing is not allowed for external financial reporting and is only used for internal management reporting.

2.1.5 Variable costing:

Variable costing (direct costing) is different from absorption (full) costing in that all variable costs are treated as inventory (cost of goods sold) costs while all fixed costs are treated as period costs (i.e., expenses as incurred). So the major difference between variable and absorption costing is the treatment of fixed manufacturing costs.

2.1.6 Kaizen costing:

Kaizen costing is a process of continuous cost management and reduction via better business activities. One of the ideas of kaizen costing is elimination or reduction of nonvalue-related activities. Kaizen costing is applied to products that have moved to the production stage. Before the production stage, target costing can be utilized to establish and manage costs. The overall idea is that after cost targets have been established, activities are undertaken to gradually improve (reduce) costs while maintaining quality of products or services.

2.2 TARGET COSTING :

2.2.1 Definitions :

Target costing method is developed as a result to the comprehension of two important facts related to the market and the costs. (Coşkun, 2003: 26).

Target cost has to be determined initially and product has to be designed in accordance with this target afterwards. (Öndeş et al., 2010: 249).

Target cost differs from “conventional cost plus” approach and instead of being a function of costs, it is a function of the sale price and the desired profit. (Ertaş, 1998:183)

Target costing approach has a simple substance : (Şakrak and Hacırüstemoğlu, 2002:118)

- Sale prices of the future products are determined in target market.
- Profit margin which is aimed to be realized is subtracted from said sale price.
- Remaining value represents the level of target cost that the product has to be manufactured in.

2.2.2 Process of Target costing:

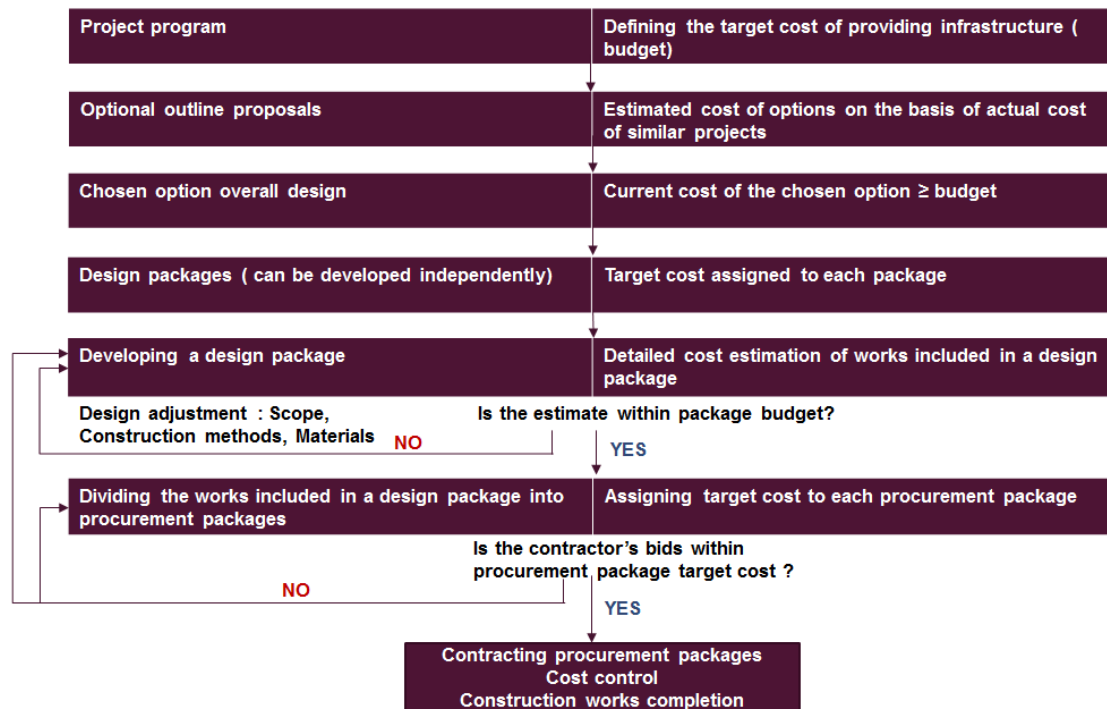


Fig 2.1: Process of Target costing

2.2.3 Principles of Target costing:

PRINCIPLES OF TARGET COSTING :	Costing in accordance with the price
	Concentrating on customer
	Concentrating on product design
	Extensive involvement
	Cost reduction during whole product life cycle
	Paying attention to value chain

Fig 2.2: Principles of Target costing

Table 2.1: Target costing Approach

TARGET COST = TARGET PRICE – TARGET PROFIT	
CONVENTIONAL COST PLUS	TARGET COSTING
APPROACH : Function of costs	APPROACH : Function of Sales price and the desired profit.

2.2.4 Understanding the Procurement packages in Target costing:

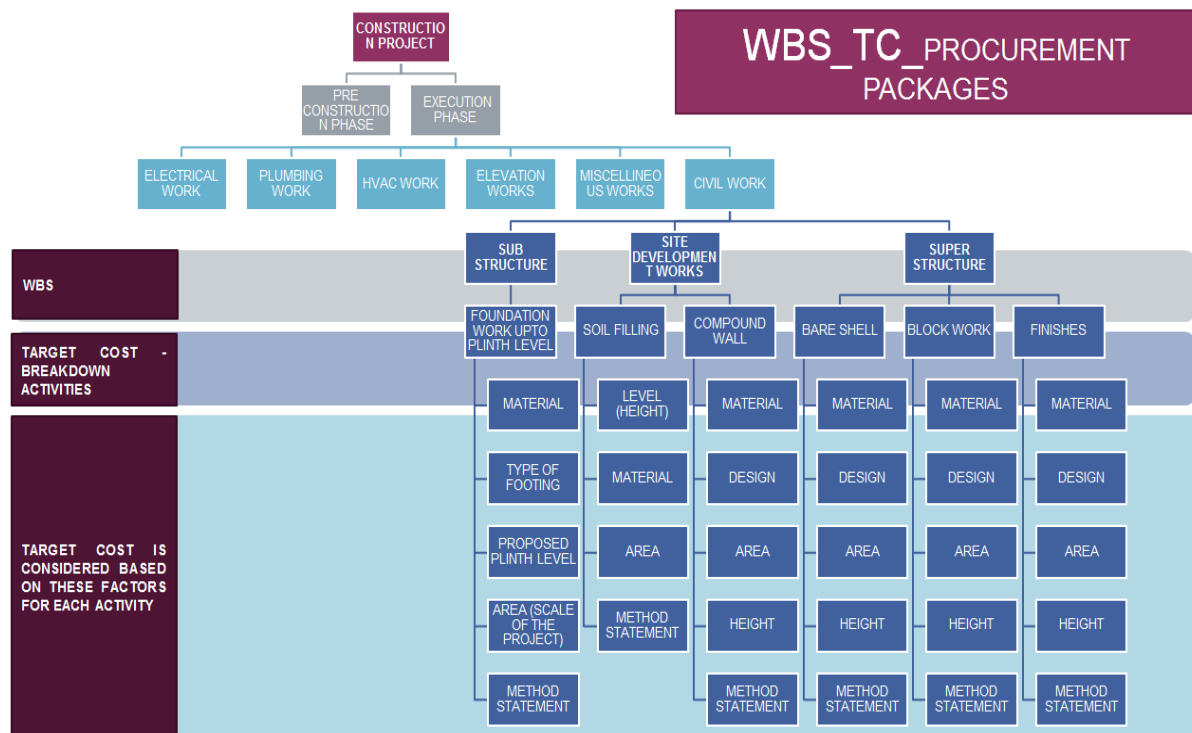


Fig 2.3 Procurement packages of Target costing

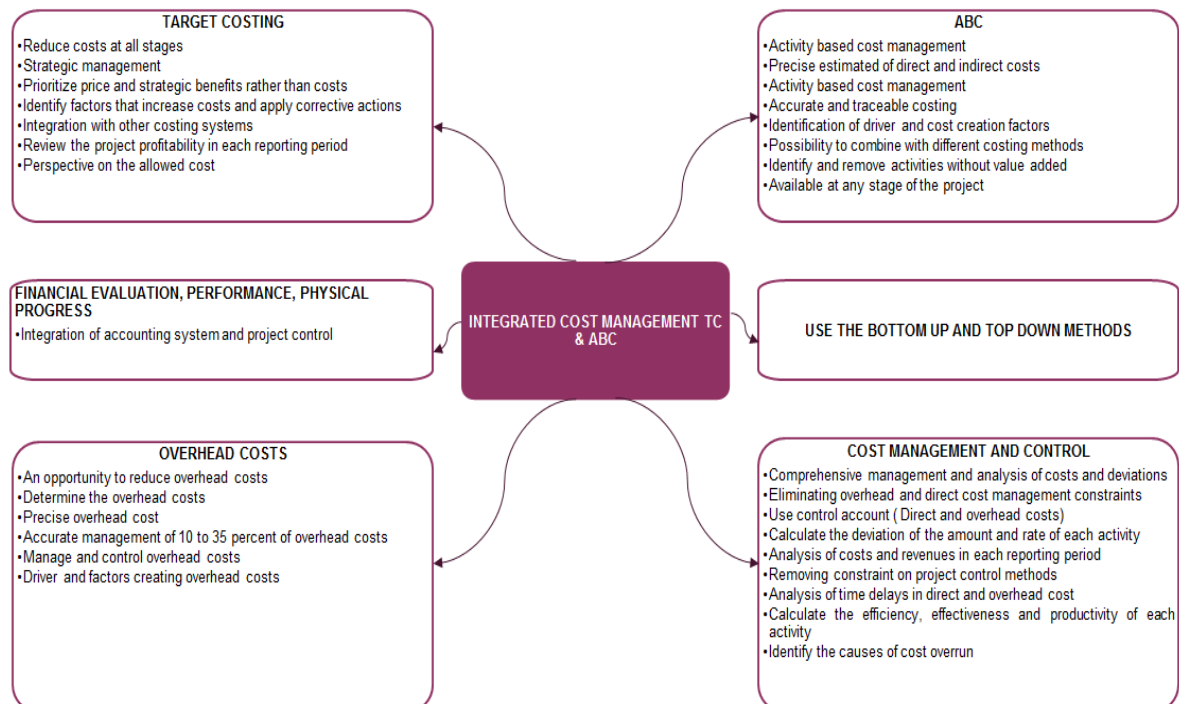


Fig 2.4 Integrated cost management (TC and ABC based on the interviews with the contractors)

Table 2.2: Target costing based on Scenario 1

				CASE 1				
Sl No	Description	Work completion (%) Total	Total cost in sft	Materials %		Labour %		Remarks
	Area -85000.00sft GF,FF,SF,TF & Terrace			Cost / Sft	Percentage	Cost/ sft	Percentage	
1	Raft & Raft Beam ,retaining wall	32	400.00	260.00	65.00	140.00	35.00	
2	Column, Roof beam & Roof Slab (Skeleton)	40	500.00	325.00	65.00	175.00	35.00	
3	Masonry (Brick work)	10	125.00	87.50	70.00	37.50	30.00	If using AAC Block 2% reduce in total cost
4	Inner Plastering	9	112.50	67.50	60.00	45.00	40.00	
5	Outer Plastering	9	112.50	67.50	60.00	45.00	40.00	
		100	1250.00					

Table 2.3: Target costing based on Scenario 2

					CASE 2			
Sl No	Description	Work completion (%) Total	Total cost in sft	Materials %		Labour %		Remarks
	Area -1000.00sft			Cost / Sft	Percentage	Cost/ sft	Percentage	
1	Isolated footing, Pedestral Column, Plinth beam, Basement filling and floor PCC	35	472.50	307.13	65.00	165.38	35.00	
2	Column, Roof beam & Roof Slab (Skeleton)	33	445.50	289.58	65.00	155.93	35.00	
7	Masonry (Brick work)	12	162.00	113.40	70.00	48.60	30.00	
8	Inner Plastering	10	135.00	81.00	60.00	54.00	40.00	
9	Outer Plastering	10	135.00	81.00	60.00	54.00	40.00	
		100	1350.00					

Table 2.4: Target costing based on Scenario 3

					CASE 3			
Sl No	Description	Work completion (%) Total	Total cost in sft	Materials %		Labour %		Remarks
	Area -40000.00sft Basement, GF to 12th Floor & Terrace			Cost / Sft	Percentage	Cost/ sft	Percentage	
1	Pile Foundation, Pile Cap, Raft Slab	27	351.00	228.15	65.00	122.85	35.00	
2	Column, Roof beam & Roof Slab (Skeleton)	48	624.00	405.60	65.00	218.40	35.00	
7	Masonry (Brick work)	9	117.00	81.90	70.00	35.10	30.00	
8	Inner Plastering	7	91.00	54.60	60.00	36.40	40.00	
9	Outer Plastering	9	117.00	70.20	60.00	46.80	40.00	

2.2.5 Need for integrating target costing and activity based costing :

The success of TC management depends on support and collaboration of other methods when it is realized. Particularly, cost reduction method called value engineering has become crucial in this aspect. Value engineering is a method used to find ways to product cost reduction, by making no concessions to product features and quality expected by the customer. (Erol, 2002:83)

2.3 ACTIVITY BASED COSTING :

Activity-based costing or ABC is a costing approach for optimizing cost and time. Besides measuring the performance of an activity, this cost accounting technique helps to identify all the costs related to every unique activity. The activity can be placed anywhere within an organizational structure, comprising of a project or process

To calculate the labor cost, one needs to multiply the number of labor with rates/day and ABC duration. The contractor paid around Rs 400/ day to each labor on average. Table 2 shows the percentage deviation in cost.

Labour cost shown in Table 2 has been calculated in the following manner:

Labor cost for foundation = ABC duration*No of labor*rate/day

= 14*5*400= Rs 28000. For other cases, it has been calculated similarly.

ABC cost for foundation = 95013.89+28000+130051.87 = Rs 253065.76. Similarly, it is calculated for other activities.

Table 2

Activities	Labor Cost (Rs)	ABC Cost (Rs)	Traditional Cost (Rs)	% Deviation
Foundation	28000	253065.76	287985.76	13.80%
Masonry	360000	1415635.98	1516876.99	7.15%
Concreting	44000	443213.88	450314	1.6%
Flooring	44000	267748	315987	18.01%
Finishes	100000	301971	309372	2.4%

The deviation clearly shows the advantage of the ABC method over the traditional method of costing.

A CASE EXAMPLE :

An ABC model has been discussed below to illustrate the difference between the traditional system and the ABC method.

Construction of a building involves typically five major activities. They are foundation, masonry, concreting, flooring and finishes. If a contractor applies traditional method, he is going to over-estimate the cost. The formula for ABC cost is given below:

ABC Cost= Activity Cost+ Labor Cost+ Overhead Cost

For this analysis data were collected for G+1 structure from a locality. Traditional costs were the actual costs borne by the contractor. The details are given in Table 1.

Table 1

Activities	ABC Duration (Days)	No of Labor	Material Cost (Rs)	Overhead Cost (Rs)
Foundation	14	5	95013.89	130051.87
Masonry	30	30	867981	187654.98
Concreting	11	10	350871	48342.88
Flooring	22	5	203891	19857
Finishes	50	5	172984	28987

Fig 2.5: A case example for Activity based costing

2.3.1 Process of Activity based costing :

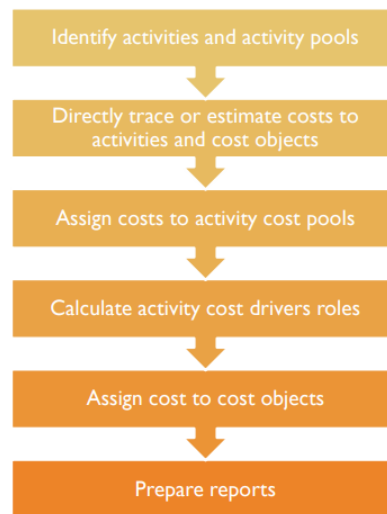


Fig 2.6: Process of Activity based costing

2.3.2 Process of ABC for calculating construction cost :

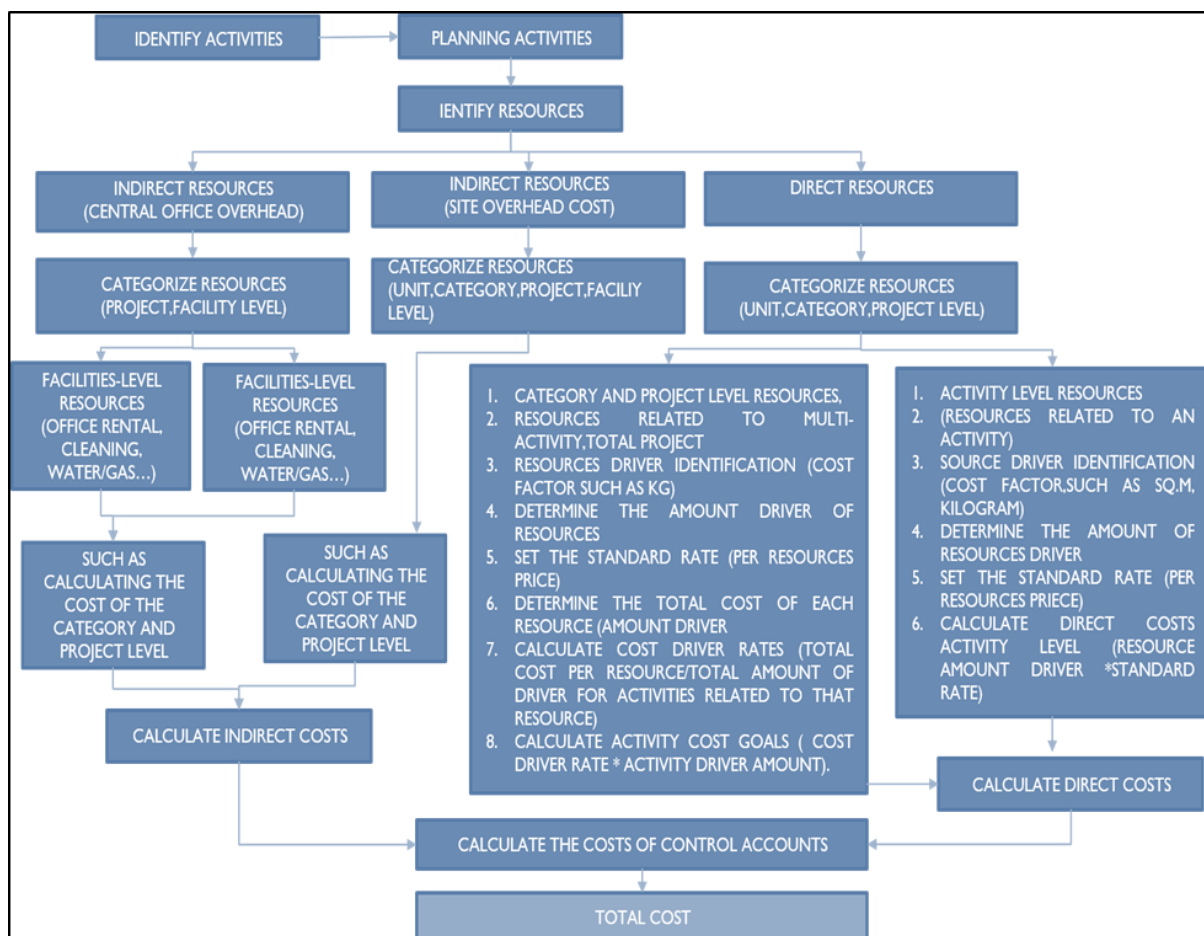


Fig 2.6: Process of Activity based costing for calculating construction cost

CHAPTER 3

CASE STUDY

3.1 CASE STUDY 1 :

3.1.1 Project Description:

Project type	:	Commercial building
Project location	:	Tada
Project year & duration	:	2018 (8 months)
Built up area	:	84,973 sq.ft
No. of floors	:	Basement+ground+3
Per floor plate	:	21,000 sq.ft

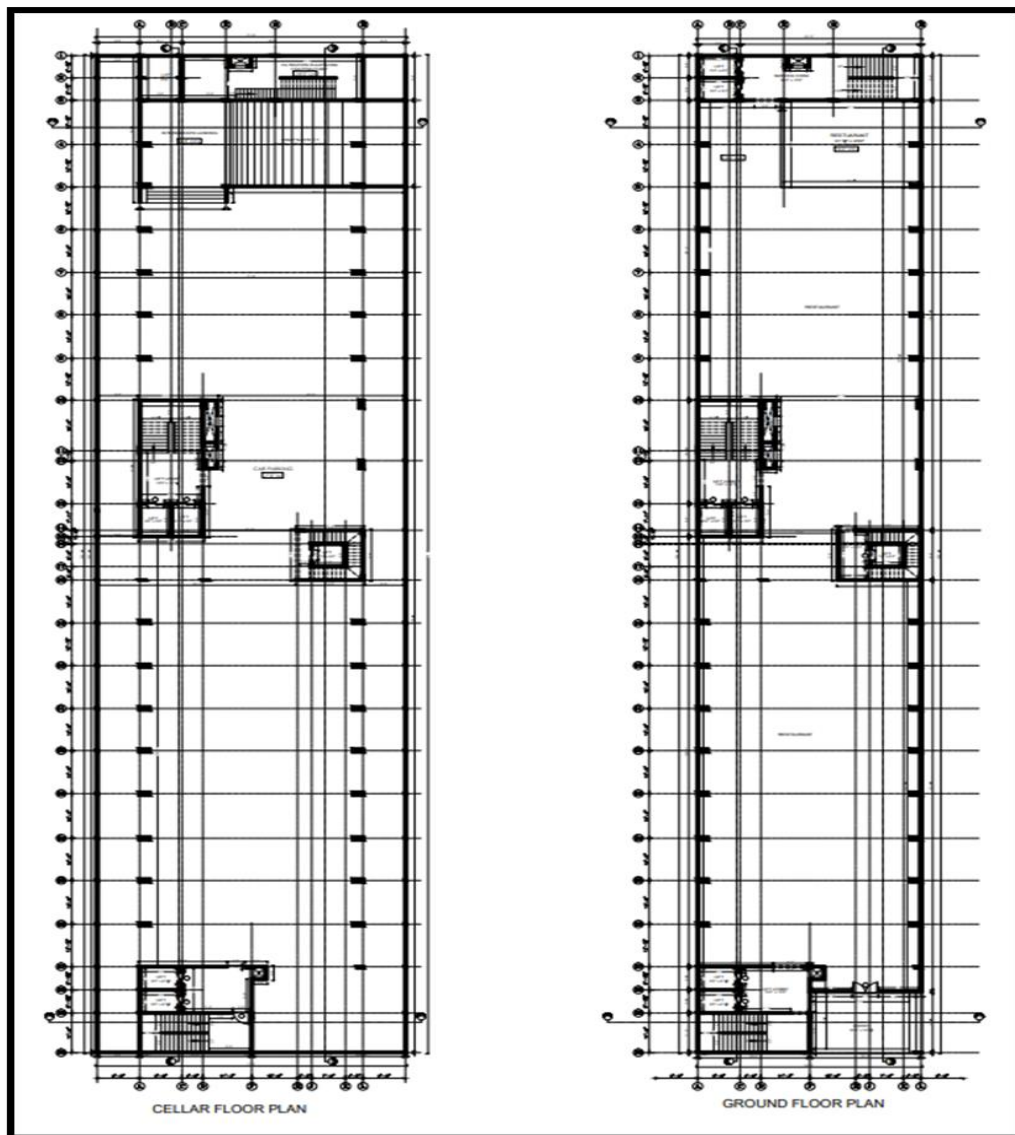


Fig 3.1: Basement and Typical floor plan

3.1.2 Schedule:

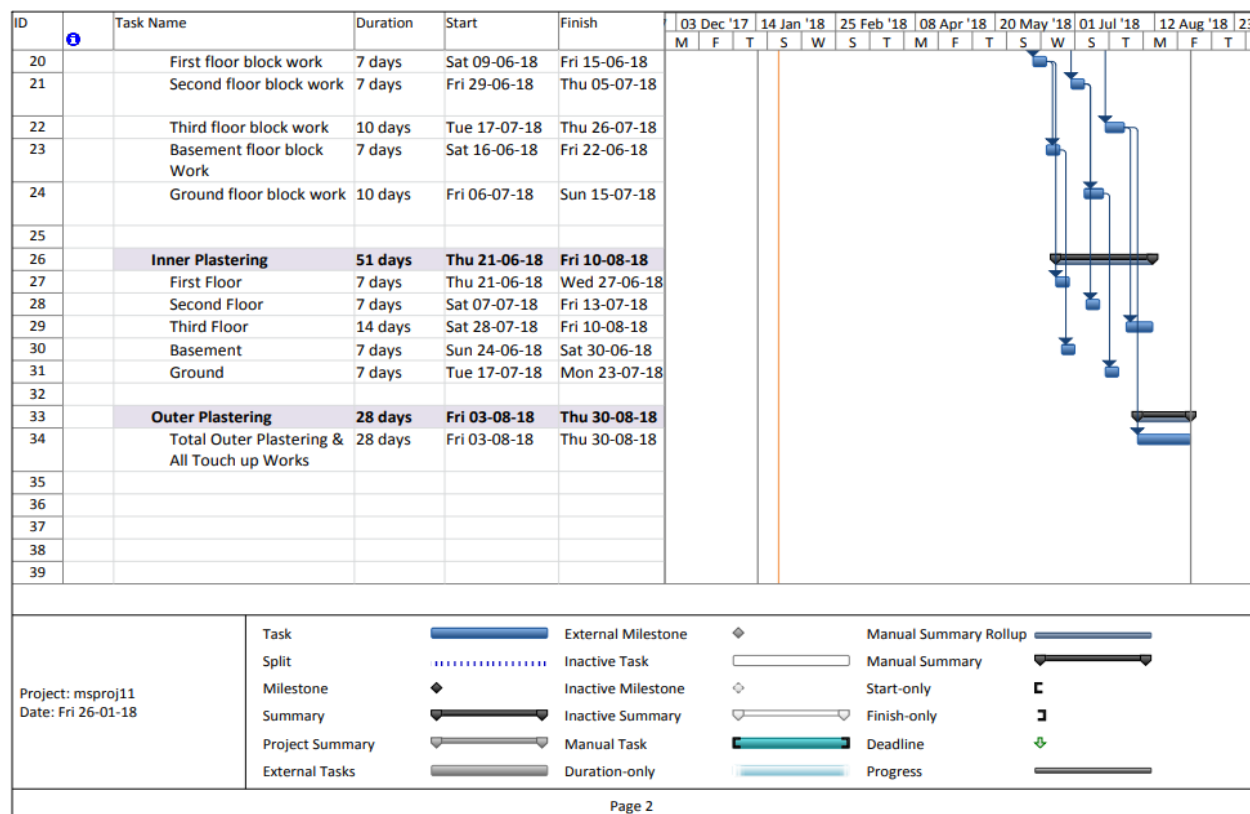
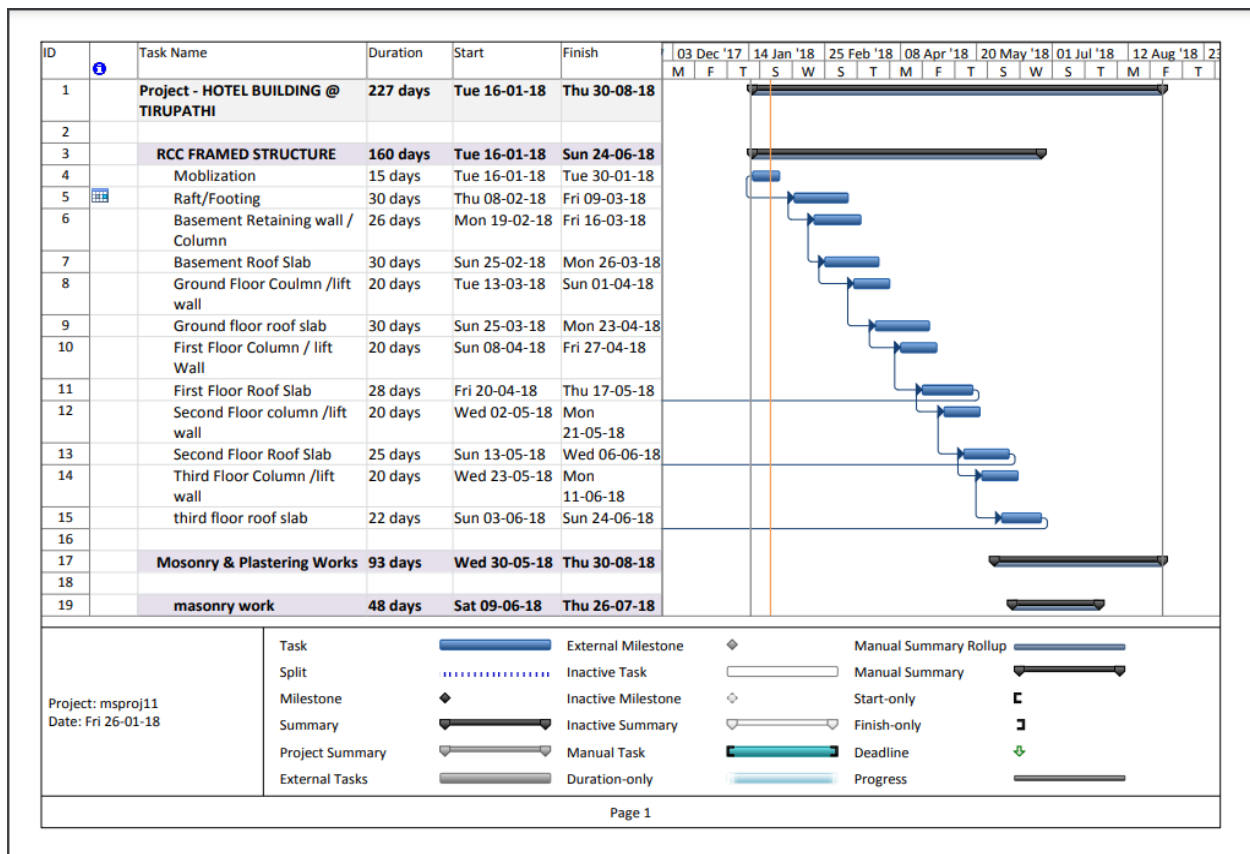


Fig 3.2: Estimated project schedule

3.1.3 Project Schedule Vs Payment Schedule:

Table 3.1: Project Schedule Vs Payment Schedule with respect to procurement packages

Project Schedule Vs Payment Schedule							
Total Area of the Building (BUA)					84973.13		
Sl no	Task	Task Duration			% break up	Amount	Required on
		No Days	Start Date	Finish Date			
1	Second Floor Roof Slab 2nd Pour	5	29 August 2018	03 September 2018	4.00%	Rs. 12,40,608	08 September 2018
2	Second Floor Roof Slab 3rd Pour	9	02 September 2018	11 September 2018	4.00%	Rs. 12,40,608	18 September 2018
3	Third Floor Roof Slab 1st Pour	7	07 September 2018	14 September 2018	4.00%	Rs. 12,40,608	21 September 2018
4	Third Floor Roof Slab 2nd Pour	7	12 September 2018	19 September 2018	4.00%	Rs. 12,40,608	26 September 2018
5	Third Floor Roof Slab 3rd Pour	7	17 September 2018	24 September 2018	4.00%	Rs. 12,40,608	01 October 2018
6	Ground floor Brick Work	5	10 September 2018	15 September 2018	1.50%	Rs. 4,65,228	22 September 2018
7	1st Floor Brick Work	5	15 September 2018	20 September 2018	1.50%	Rs. 4,65,228	27 September 2018
8	2nd Floor Brick Work	5	20 September 2018	25 September 2018	1.50%	Rs. 4,65,228	02 October 2018
9	3rd Floor Brick Work	10	25 September 2018	05 October 2018	1.50%	Rs. 4,65,228	12 October 2018
10	Ground floor inner Plastering	7	20 September 2018	27 September 2018	1.50%	Rs. 4,65,228	04 October 2018
11	1st Floor inner Plastering	7	26 September 2018	03 October 2018	1.50%	Rs. 4,65,228	10 October 2018
12	2nd Floor inner Plastering	7	02 October 2018	09 October 2018	1.50%	Rs. 4,65,228	16 October 2018
13	3rd Floor inner Plastering	12	08 October 2018	20 October 2018	1.50%	Rs. 4,65,228	27 October 2018
14	Outer Plastering East	12	20 October 2018	01 November 2018	3.00%	Rs. 9,30,456	08 November 2018
15	Outer Plastering North	6	01 November 2018	07 November 2018	3.00%	Rs. 9,30,456	14 November 2018
16	Outer Plastering West	12	12 November 2018	24 November 2018	3.00%	Rs. 9,30,456	01 December 2018

17	Outer Plastering South	6	24 November 2018	30 November 2018	3.00%	Rs. 9,30,456	07 December 2018
Total Amount						Rs. 1,36,46,685	

3.1.3 Inference:

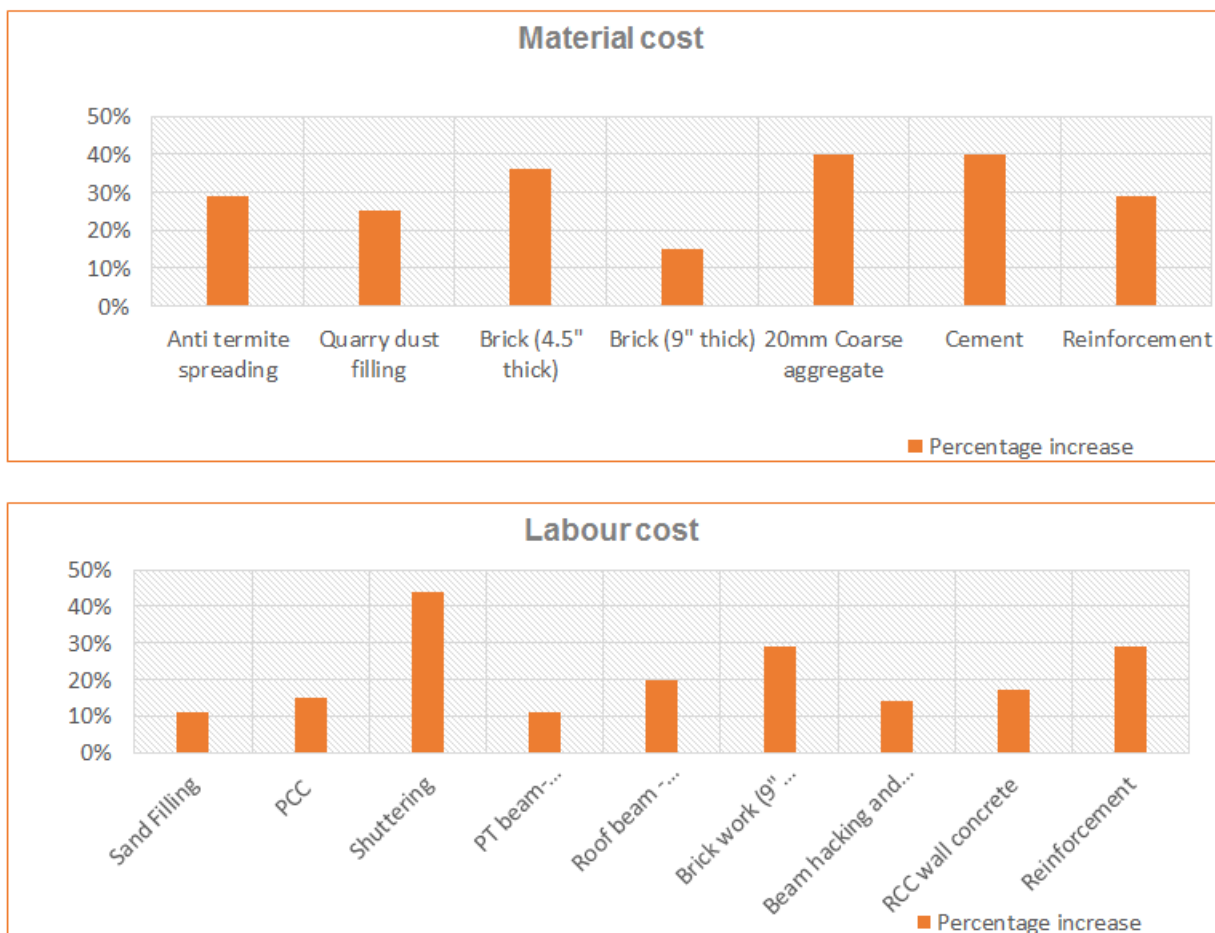


Fig 3.3: Bar chart showing most influential factor for cost overruns in case study 1 with reference to Annexure 1

Table 3.2: Scheduled vs Actual analysis on rental aspect:

	SCHEDULED COMPLETION	ACTUAL COMPLETION	REMARKS
Upto second floor column and lift walls	17-05-2018	19-5-2018	AS PER SCHEDULE

Second floor slab	06-06-2018	03-09-2018	3 Months delay- Due to unavailability of fund (payment delay from client side)
From third floor column till the finish works	30-11-2018	30-11-2018	AS PER SCHEDULE
Description	Area (in Sq.ft)	Rent per Sq.ft (INR)	Total Amount (INR)
Ground floor	21000	70	1470000
First floor	21000	40	840000
Second floor	21000	30	630000
Third floor	21000	30	630000
Total Rental amount for 1 month			3570000
Total Rental amount for 3 months			10710000

3.2 CASE STUDY 2 :

3.2.1 Project Description:

PROJECT DETAILS	
Project type	Warehouse
Project location	Pune, India
Built up area	464500 Sq.ft
PROJECT COST INFORMATION	

Total Contract (INR)	123 Million
Final Amount (INR)	128 Million
Cost Increase (%)	3.4%
Project Start Date	30 July - 17
Project Completion Date	01 June -19

3.2.2 Scope of the project:

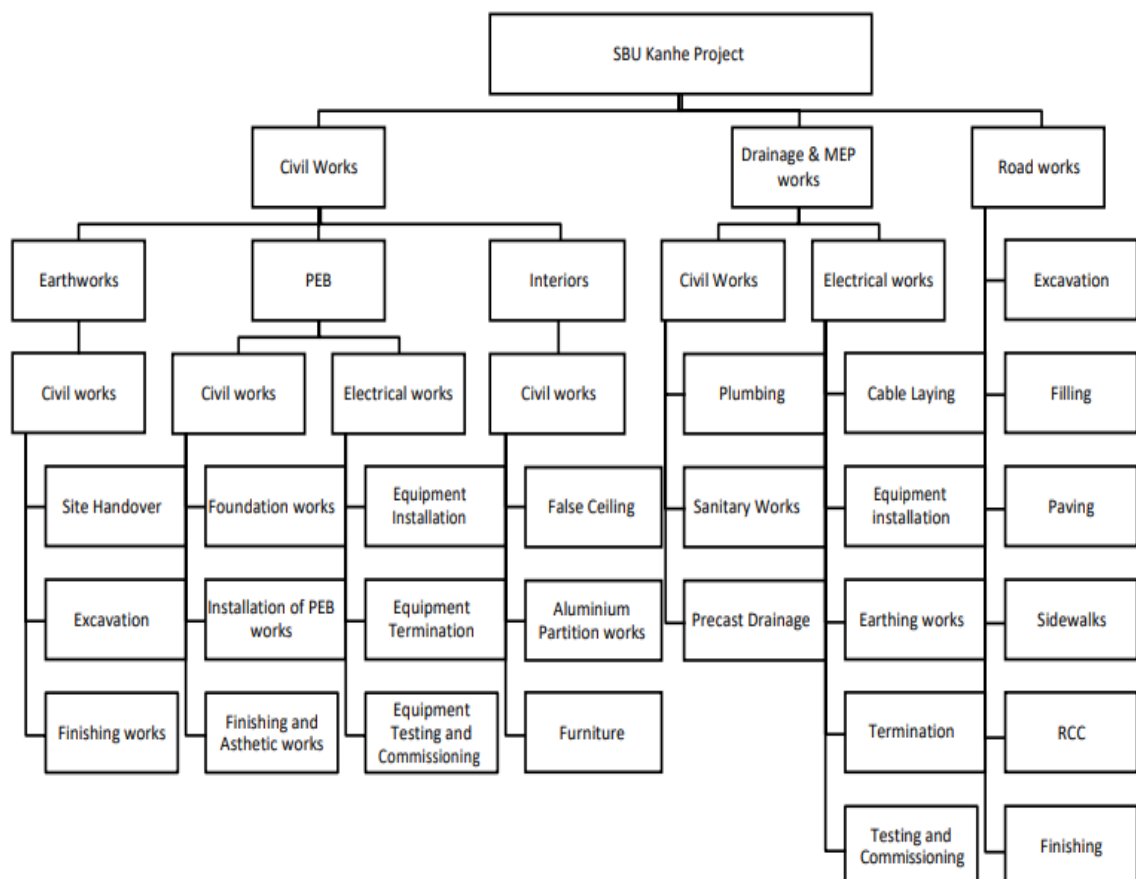


Fig 3.4: Scope of the project with work breakdown structure

3.2.3 Inference:

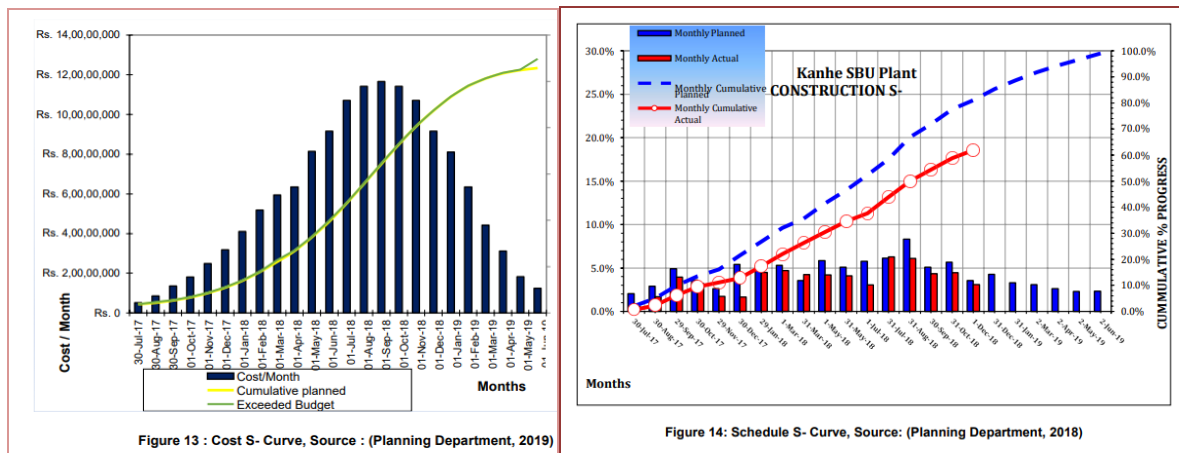


Fig 3.4: S-curve for Cost and Schedule

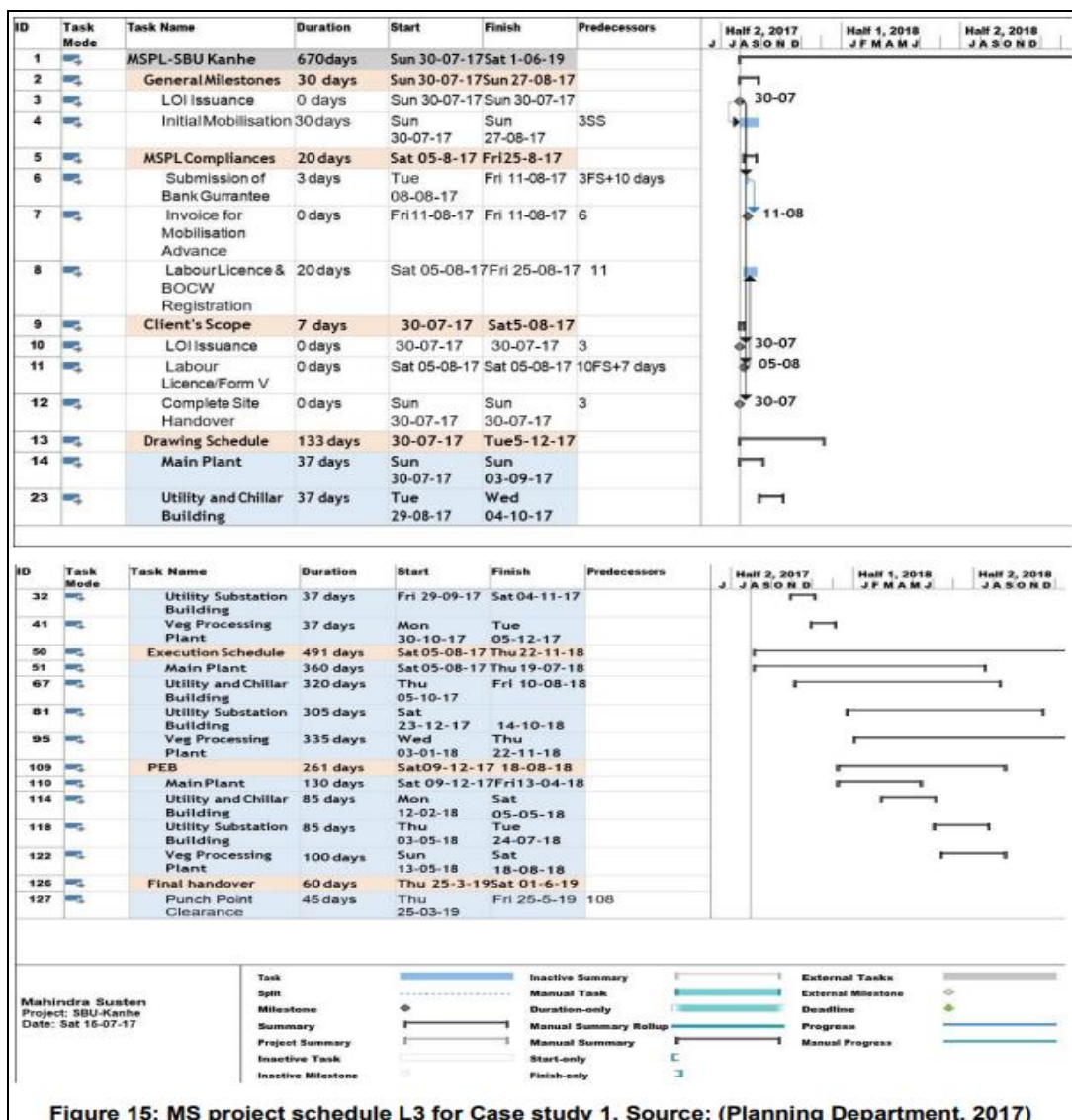


Fig 3.5: Project Schedule for case study 2

Table 3.3: Scheduled project milestones:

Task No.	Milestone	Baseline Start
	Project Commencement Date	30-07-17
1	LOI Issuance	30-07-17
2	Completion of Main Plant	05-08-17
3	PEB Works Delivery	10-10-17
4	Completion of FRC Flooring Works	7-04-18
5	Completion of Finishing Works	10-08-18
6	Completion of Utility boiler and Chillar building- L5	05-10-17
7	PEB Material Delivery for Utility	03-09-17
8	Finishing Work for Utility boiler and Chillar building	25-05-18
9	Block Work & Plastering (Peripheral)	15-10-17
10	Completion of Utility substation Building- L5 Schedule	29-07-18
11	Completion of Veg Processing Plant- L5 Schedule	03-01-18
12	PEB Material Delivery for Processing Plant	13-5-18
13	Finishing Work for Processing Plant	18-8-18
14	Punch Points Clearance	25-05-19
15	Project Completion Date	01-06-19

Table 3.4: Root cause analysis for the delay and cost overruns:

Description	Reason for Delay & Cost Overruns
Data Availability from Client/ Tendering Issues	• During Tendering, Initial surface as normal murrum, but during execution, Rock was encountered. • No Drawings Provided for Electrical Layout • Temporary Pad Construction, No consideration in Tendering stage • Last-Minute Changes / Scope changes
Drawings & Specifications	• Late Approval • Revision of IFCs Drawing • Design Errors • Missed co-ordination of Drawing No & approved IFC during Construction
Planning	• Wrong Estimate of Time as given by Client • Co-ordination issue between different contractors • Late Time Delivery of Materials • Payment issues
Quality	• No SOPs for a process • No proper training before the start of the activity • Checklist not followed • Improper Storage of materials at the site
Execution	• Labor Shortage • Unskilled Workers • Safety Issues • Strikes

Table 3.4: FMEA for the delay and cost overruns

Process	Failure Mode	Effect of Failure	Potential Cause	Corrective Action
Unskilled Worker	Lack of Training	Poor Construction	Lack of skilled workers	Development of Quality Team & Proper Knowledge Management System
Improper Storage	No storage	Material Loss	IMS Policy not followed	5S system
Incorrect Specifications	Low price by client	Inefficient selection of the contractor	Technical staff	Specifying Proper T&C in contract
Procurement	Late Delivery	Delay Overrun	Lack of Planning	JIT method

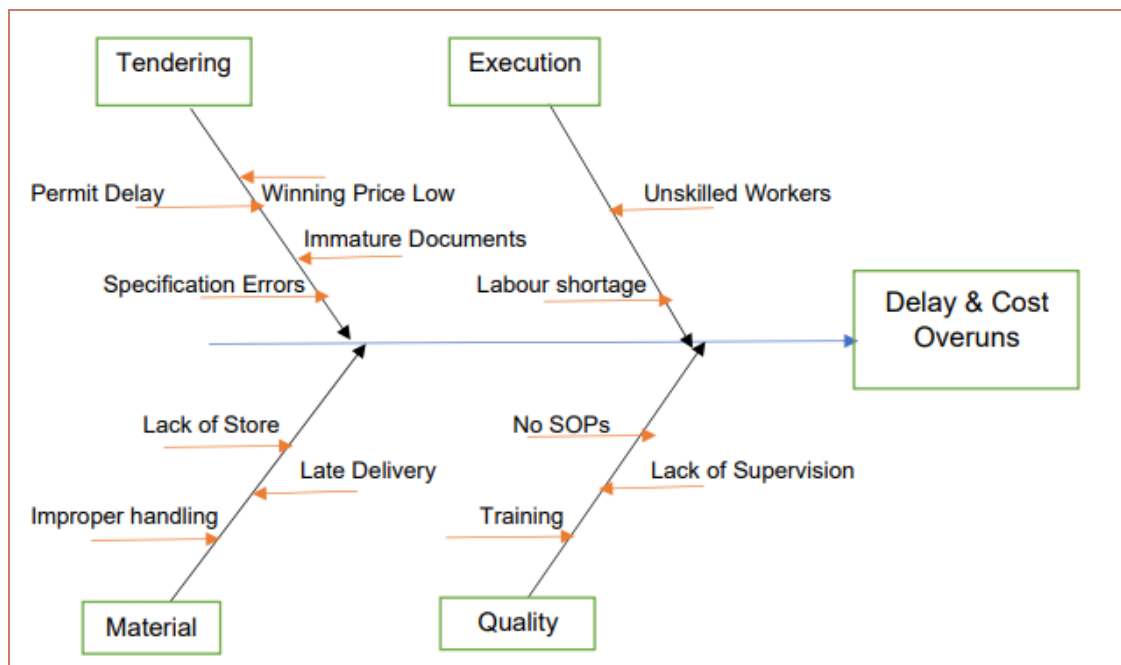


Fig 3.6: Fish borne analysis for Delay and cost overruns

3.3 CASE STUDY 3:

3.3.1 Project Description:

SITE LOCATION :SIPCOT Industrial Park,
Pillaipakkam, Sriperumbudur Taluk,
Kancheepuram District – 602105,
Tamilnadu.

SITE EXTENT :25 Acres

TPOLOGY :Industrial building

BLOCK :R&D Centre

BUILT UP AREA :1,00,000 Sq.ft

NO. OF FLOORS :16 floors

PROJECT STATUS : 7th floor under construction

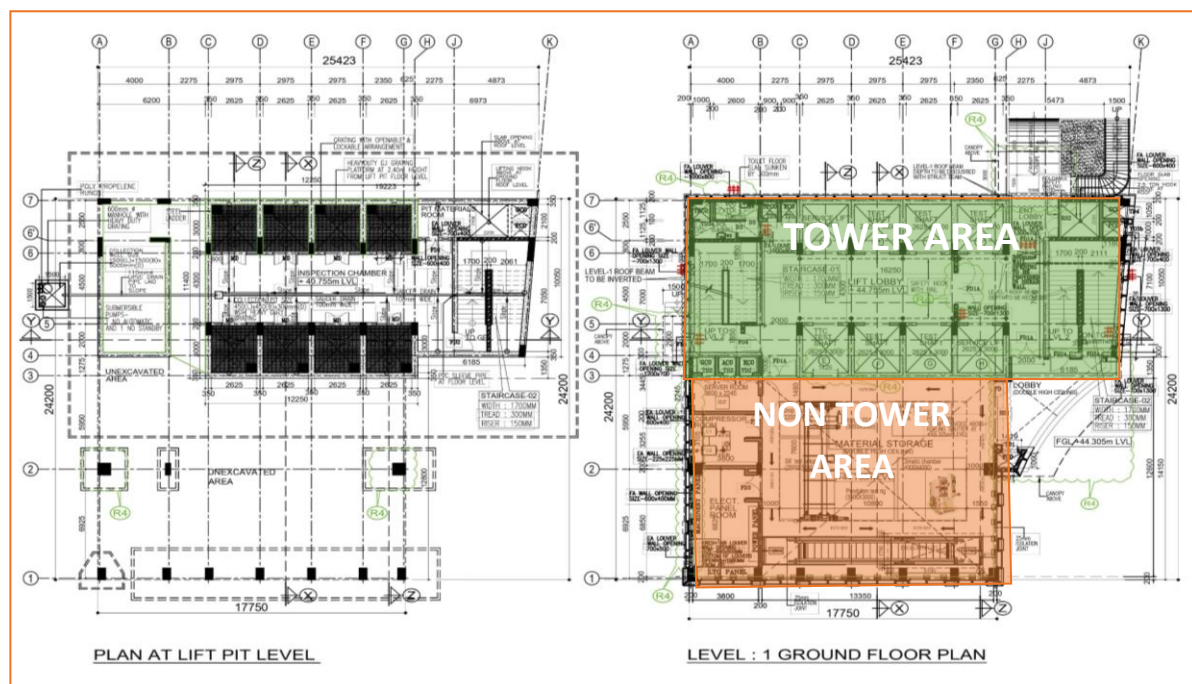
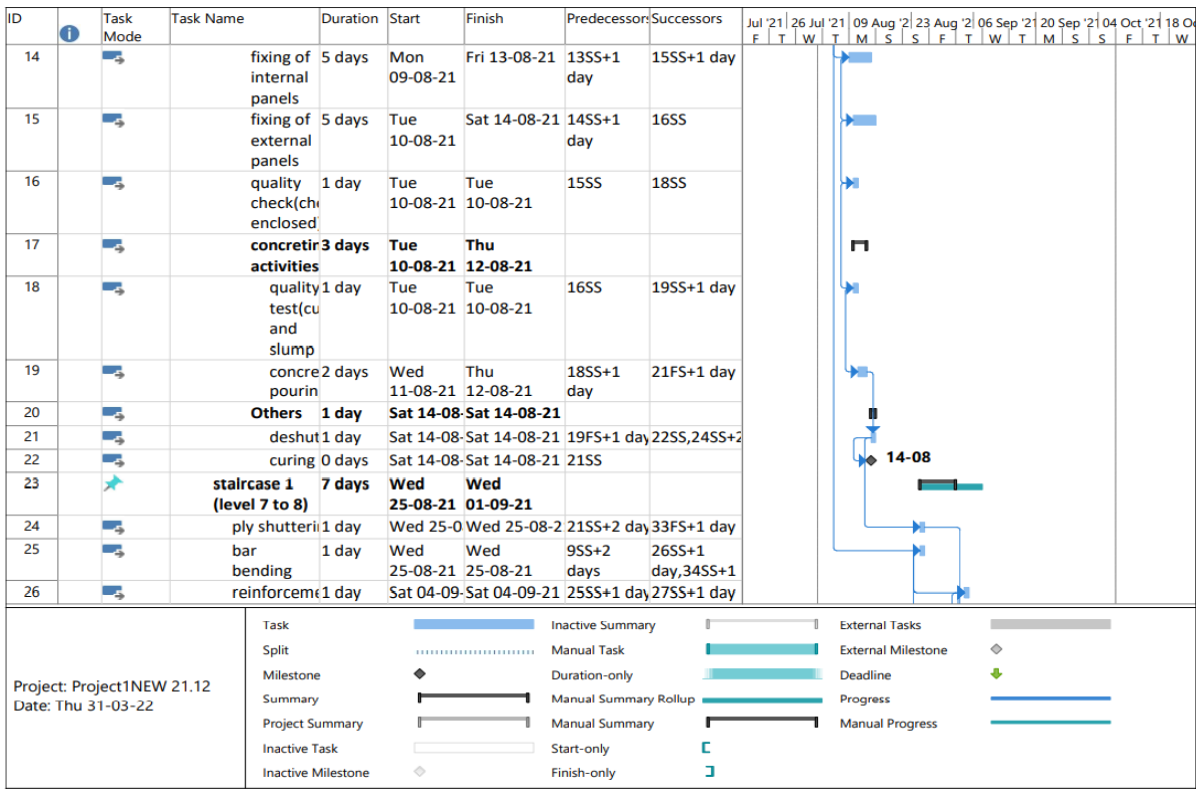
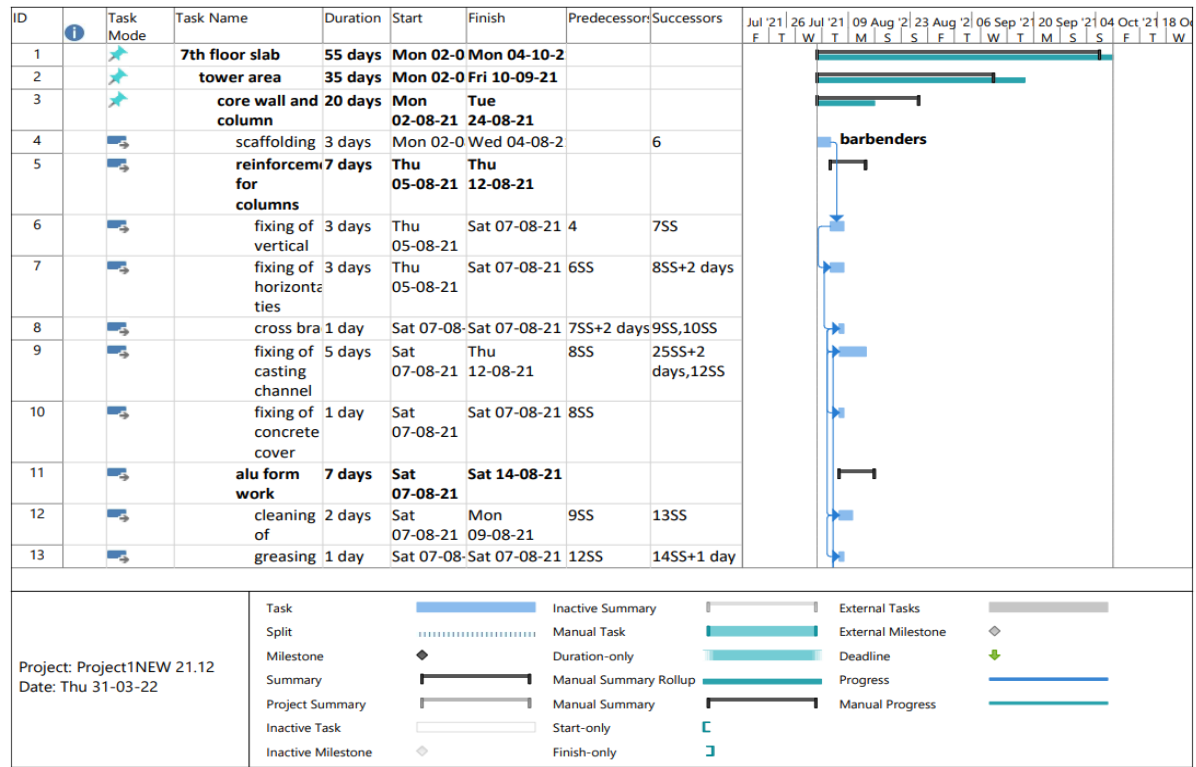
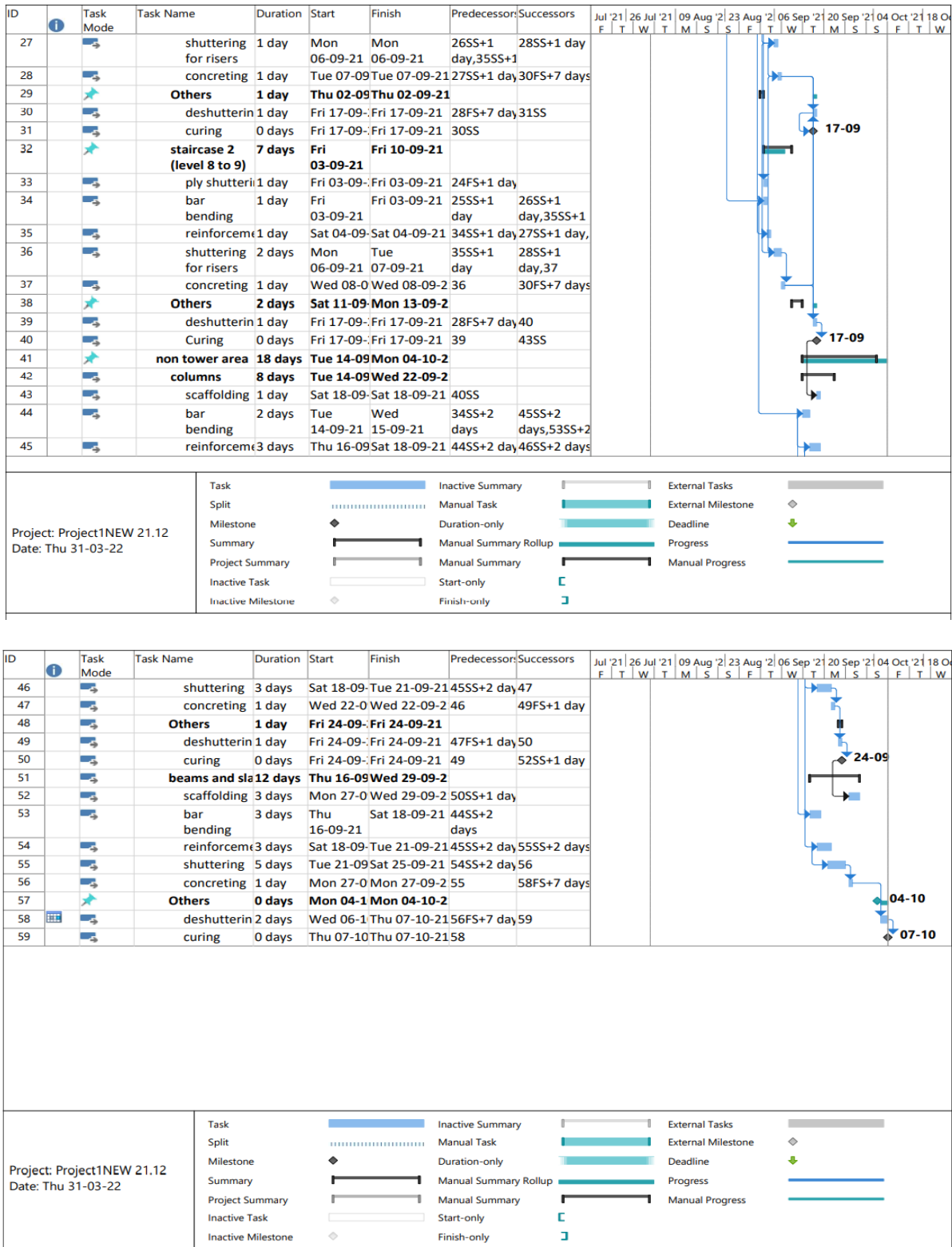


Fig 3.7: Plan at lift pit level and typical floor plan

3.3.2 Project Schedule (Actual):





Project: Project1NEW 21.12
Date: Thu 31-03-22

Task

Split

Milestone

Summary

Project Summary

Inactive Task

Inactive Milestone

Inactive Summary

Manual Task

Duration-only

Manual Summary Rollup

Manual Summary

Start-only

Finish-only

External Tasks

External Milestone

Deadline

Progress

Manual Progress

Fig 3.8: Project schedule (Actual- 55 days to complete one floor plate)

3.3.3 Project Scheduled vs Actual comparison:

Table 3.5: Project Scheduled vs Actual comparison

Schedule Vs Actual								Status up to: 18-10-2021		
Description	Unit	Total Qty	As on date completed	Balance to be completed	As per Schedule start date	Actual start date	Target date	As per Schedule (to be achieved/day)	Actual achieved up to date	Status
LEVEL 6 TO LEVEL 7										
EFGH SHAFT REINFORCEMENT 1ST LIFT	MT	7.90	7.90	0.00	08-10-21	08-10-21	11-10-21	0.00	0.00	Completed
EFGH SHAFT BEAM REINFORCEMENT	MT	2.00	2.00	0.00	12-10-21	11-10-21	13-10-21	0.00	0.00	Completed
EFGH CASTING CHANNEL FIXING 1ST LIFT	RMT	157.00	154.20	2.80	14-10-21	08-10-21	18-10-21	2.80	15.42	Ahead the schedule
EFGH WALL SHUTTERING 1ST LIFT	SQM	292.00	225.00	67.00	19-10-21	14-10-21	22-10-21	0.00	56.25	Ahead the schedule
EFGH WALL CONCRETING 1ST LIFT	CUM	44.00	0.00	44.00	23-10-21		23-10-21	0.00	0.00	As per the schedule
CORE WALL ABCD										
ABCD SHAFT WALL REINFORCEMENT 1ST LIFT	MT	7.90	1.50	6.40	14-10-21	17-10-21	17-10-21	6.40	1.50	Behind the schedule
ABCD SHAFT BEAM REINFORCEMENT	MT	2.00	0.00	2.00	18-10-21		19-10-21	0.00	FALSE	Ahead the schedule
ABCD WALL CASTING CHANNEL FIXING 1ST LIFT	RMT	157.00	0.00	157.00	20-10-21		24-10-21	0.00	0.00	As per the schedule
ABCD WALL SHUTTERING 1ST LIFT	SQM	292.00	0.00	292.00	23-10-21		26-10-21	0.00	0.00	As per the schedule
ABCD WALL CONCRETING 1ST LIFT	CUM	44.00	0.00	44.00	27-10-21		27-10-21	0.00	0.00	As per the schedule
STAIRCASE 1 WALL										
STAIR 1 WALL REINFORCEMENT	MT	4.00	4.00	0.00	11-10-21	08-10-21	14-10-21	0.00	0.00	Completed

1ST LIFT										
STAIR 1 WALL SHUTTERING 1ST LIFT	SQM	150.97	150.97	0.00	14-10-21	12-10-21	16-10-21	0.00	0.00	Completed
STAIR 1 WALL CONCRETING 1ST LIFT	CUM	18.00	18.00	0.00	17-10-21	16-10-21	17-10-21	0.00	0.00	Completed
STAIRCASE 2										
STAIR 2 WALL REINFORCEMENT 1ST LIFT	MT	4.00	0.00	4.00	20-10-21		23-10-21	0.00	0.00	As per the schedule
STAIR 2 WALL SHUTTERING 1ST LIFT	SQM	146.48	0.00	146.48	24-10-21		27-10-21	0.00	0.00	As per the schedule
STAIR 2 WALL CONCRETING 1ST LIFT	CUM	20.91	0.00	20.91	28-10-21		28-10-21	0.00	0.00	As per the schedule
STAIRCASE 2										
FLIGHT-1 & 2										
STAIR 2 LEVEL 4 TO LEVEL 5 SHUTTERING	SQM	46.67	46.67	0.00	08-10-21	11-10-21	10-10-21	0.00	0.00	Completed
STAIR 2 LEVEL 4 TO LEVEL 5 REINFORCEMENT	MT	0.80	0.80	0.00	11-10-21	13-10-21	12-10-21	0.00	0.00	Completed
STAIR 2 LEVEL 4 TO LEVEL 5 CONCRETING	CUM	6.67	6.67	0.00	13-10-21	16-10-21	13-10-21	0.00	0.00	Completed
STAIRCASE 2										
FLIGHT-3 & 4										
STAIR 2 LEVEL 5 TO LEVEL 6 SHUTTERING	SQM	46.67	0.00	46.67	14-10-21		16-10-21	46.67	0.00	Behind the schedule
STAIR 2 LEVEL 5 TO LEVEL 6 REINFORCEMENT	MT	0.80	0.00	1.10	17-10-21		18-10-21	1.10	0.00	Behind the schedule
STAIR 2 LEVEL 5 TO LEVEL 6 CONCRETING	CUM	6.67	0.00	6.67	19-10-21		19-10-21	0.00	0.00	As per the schedule
STAIRCASE 1										
FLIGHT-1 & 2										

STAIR 1 LEVEL 4 TO LEVEL 5 SHUTTERING	SQM	40.00	0.00	40.00	18-10-21		20-10-21	0.00	FALSE	Ahead the schedule
STAIR 1 LEVEL 4 TO LEVEL 5 REINFORCEMENT	MT	0.80	0.00	0.80	21-10-21		22-10-21	0.00	0.00	As per the schedule
STAIR 1 LEVEL 4 TO LEVEL 5 CONCRETING	CUM	6.67	0.00	6.67	23-10-21		23-10-21	0.00	0.00	As per the schedule
STAIRCASE 1										
FLIGHT-3 & 4										
STAIR 1 LEVEL 5 TO LEVEL 6 SHUTTERING	SQM	40.00	0.00	40.00	24-10-21		26-10-21	0.00	0.00	As per the schedule
STAIR 1 LEVEL 5 TO LEVEL 6 REINFORCEMENT	MT	0.80	0.00	0.80	27-10-21		28-10-21	0.00	0.00	As per the schedule
STAIR 1 LEVEL 5 TO LEVEL 6 CONCRETING	CUM	6.67	0.00	6.67	29-10-21		29-10-21			As per the schedule
STAIRCASE 1										
FLIGHT-5 & 6										
STAIR 1 LEVEL 5 TO LEVEL 6 SHUTTERING	SQM	40.00	0.00	40.00	30-10-21		01-11-21	0.00	0.00	As per the schedule
STAIR 1 LEVEL 5 TO LEVEL 6 REINFORCEMENT	MT	0.80	0.00	0.80	02-11-21		03-11-21	0.00	0.00	As per the schedule
STAIR 1 LEVEL 5 TO LEVEL 6 CONCRETING	CUM	6.67	0.00	6.67	04-11-21		05-11-21			As per the schedule
COLUMN										
COLUMN REINFORCEMENT	MT	13.40	0.00	13.40	11-10-21		17-10-21	13.40	0.00	Behind the schedule
COLUMN SHUTTERING	SQM	106.00	0.00	106.00	15-10-21		20-10-21			As per the schedule
COLUMN CONCRETING	CUM	17.00	0.00	17.00	19-10-21		23-10-21	0.00	0.00	As per the schedule
Slab and Beam										
LEVEL 7 SLAB	SQM	627.00	0.00	627.00	24-10-21		02-11-21	0.00	0.00	As per the

SHUTTERING										schedule
LEVEL 7 SLAB REINFORCEMENT	MT	20.26	0.00	20.26	20-09-21		07-11-21			As per the schedule
LEVEL 7 SLAB CONCRETE	CUM	102.00	0.00	102.00	09-11-21		09-11-21	0.00	0.00	As per the schedule

3.3.4 Comparison for change in method statement:

Table 3.6: Different types of form work and it's comparison:

S.NO	CRITERIA		CONVENTIONAL FORMWORK SYSTEMS	ALU FORM WORK SYSTEM	CLIMBING FORM WORK SYSTEMS
1	BUILDING PARAMETERS	HEIGHT	Maximum 100 m	There is no minimum and maximum limit	Minimum 75 meters and no maximum limit
		AREA	Maximum of 600 Sq.m per floor	Not an influencing factor	Not an influencing factor
		TYPE OF HIGH RISE STRUCTURE	Rigid frame	Framed wall	Framed wall
		WORKSPACE	For making panels	Not an influencing factor	Not an influencing factor
2	CONSTRUCTION PARAMETERS	TYPE OF PROJECTS	Not an influencing factor	Preferably typical floor plan	Preferably typical floor plan
		CONSTRUCTION SEQUENCE	Wall casted ahead of beams and slabs	Monolithic casting	Monolithic casting
		NO. OF REUSE	5-7 times	Upto 150 repetitions	15-30 times
		REWORK	Lots of reworks	No problem of misalignment if the runner is placed properly	No problem of misalignment
		CONCRETE FINISH	Rough finish and need to be plastered	High quality finish – No need plastering work	High quality finish – No need plastering work
		CYCLE TIME	14 days	7 days	4-5 days
		SUPPORTING EQUIPMENTS	Crane dependent, Need scaffolding for platform	Crane dependent, Need scaffolding for platform	Crane independent and platform with formwork itself

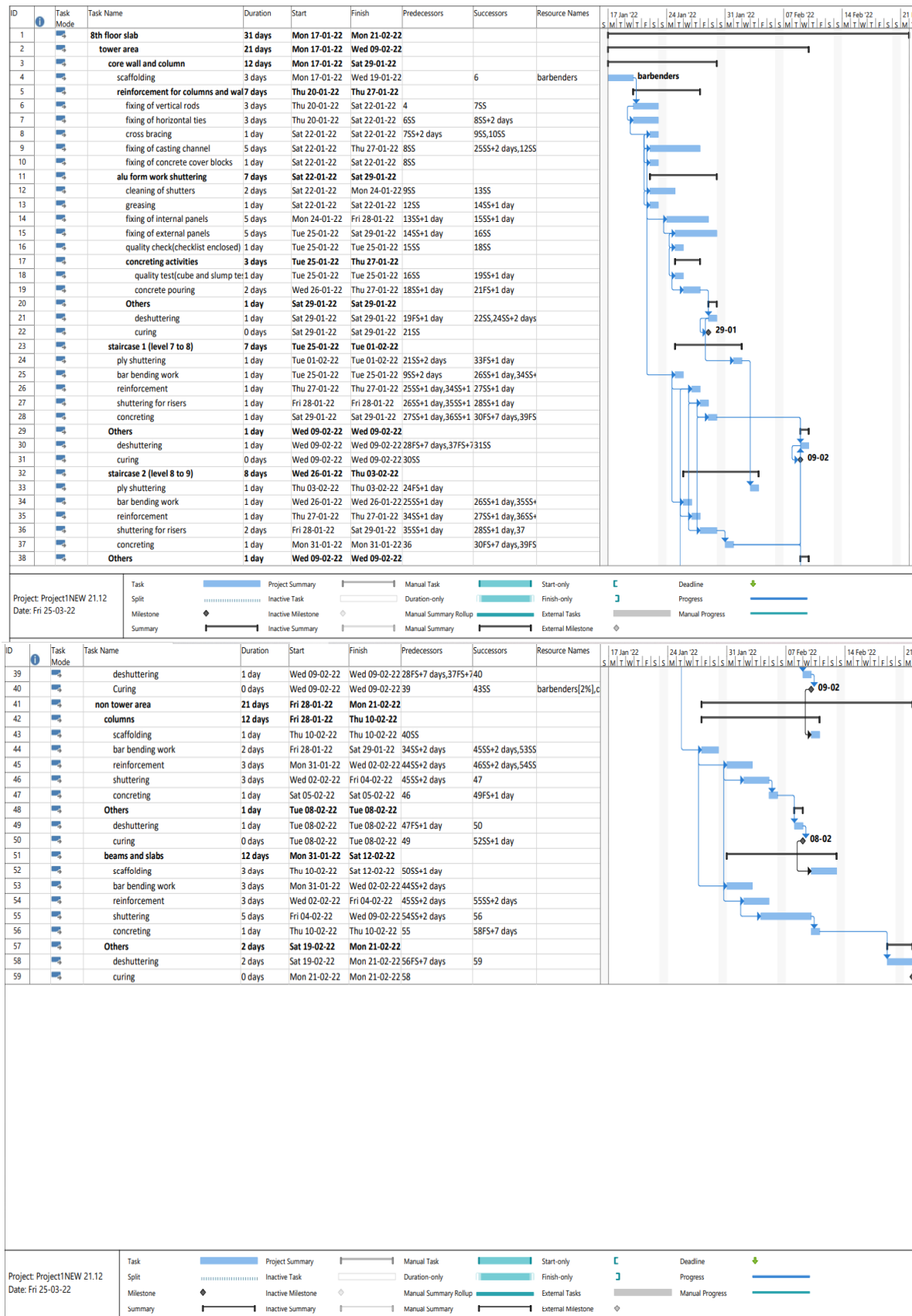


Fig 3.9: Project schedule proposal (one floor plate can be completed in 33 days)

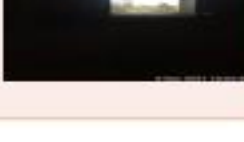
3.3.5 Root cause analysis for cost variance:

Table 3.7:Root cause analysis for cost variance

ROOT CAUSE ANALYSIS FOR COST VARIANCE		
S.NO	DESCRIPTION	REASON FOR DELAY AND COST VARIANCE
1	LABOR SHORTAGE	Delay in work due to inconsistency in mobilization of labor on time whenever required which apparently caused delay in the construction activities and made it difficult to track on the manpower schedule.
2	MATERIAL MANAGEMENT	There is no control on the usage of plywood and runner, due to improper stagnation no identification of used material, and every time using new material . As per the labor wish, they cut the new board and placing it wherever required and there is no control on the usage of materials .In this context found major wastage of shuttering material and improper handling of scaffolding material
		Due to improper handling of materials there is major wastage in reinforcement steel (8% instead of 3%)
		Passenger hoist was not in a working condition - due to this mobilization time get increased and productivity get reduced
3	QUALITY ISSUES	Change in wall alignments in Alu form work areas, cut outs are not braced properly during concreting activity which lead to Chipping and grinding works and causes some delay. Sleeves were not removed in some of the walls which is left projected. Honey comb formation not treated properly. Shuttering ply were not removed in some portions of slab.
4	SUB CONTRACTOR	Delay in work due to lack of skilled labour for fixing the Cast in channel in lift core area
		Improper communication to the higher management regarding the work delays and disputes between the contractors
5	TYPE OF WORK	Alu form work was used for core walls in tower area and conventional type form work was used in non tower areas and slabs.
6	ADHERENCE TO THE SCHEDULE	Penalty due to improper adherence to the schedule, Delay due to Pandamic situation is acceptable
		Market price of materials got escalated.

3.3.6 Quality issues that caused delay :

Table 3.8: Quality issues that caused delay

Sl.No	Observation	Location	Before Photos	Status	Identified on	Target date
1	grinding work	E shaft north side wall		open	10-Dec-21	Immediate
2	grinding work	c1 and c4 column grinding work		open	10-Dec-21	Immediate
3	grinding work	Stair 1 north side wall		open	10-Dec-21	Immediate
4	chipping work	double height area cutout		open	10-Dec-21	Immediate
5	chipping work	Staircase 2 west side beam		open	10-Dec-21	Immediate
6	grinding work	non tower area column grid a1 to g1		open	10-Dec-21	Immediate
7	tie rod cutting	E,F,G,H wall east side		open	10-Dec-21	Immediate
8	chipping work	Staircase 1 landing slab		open	10-Dec-21	Immediate
9	grinding works	Staircase 1 landing slab		open	10-Dec-21	Immediate
10	chipping work	Staircase 1 cut out opening		open	10-Dec-21	Immediate

CHAPTER 4

FACTORS INFLUENCING COST IN CONSTRUCTION

4.1 FACTORS INFLUENCING COST IN CONSTRUCTION AND THEIR RANKING BASED ON THE SURVEY RESULTS :

Table 4.1: Client qualities related factors

I	Client qualities related factors:	Client view	Consultant view	Contractor view	Average	
		RII	RII	RII	RII	Rank
1	Financial conditions of the client	0.81	0.82	0.83	0.820	1st
2	Payment delay by the client	0.76	0.78	0.82	0.787	2nd
3	Clear degree definition for the owner	0.75	0.75	0.72	0.740	3rd
4	Client Priority on construction time/deadline requirements	0.7	0.78	0.74	0.740	4th
5	Change/variation by the client during construction	0.71	0.74	0.76	0.737	5th
6	Owners assessment and granting strategy	0.73	0.74	0.73	0.733	6th
7	Owners necessities and desires on quality	0.71	0.75	0.74	0.733	7th
8	Correspondence and coordination with consultants	0.71	0.65	0.79	0.717	8th
9	Owners experience level on construction	0.72	0.69	0.7	0.703	9th
10	Category of owners	0.71	0.67	0.64	0.673	10th
11	Owner understanding on procuring construction projects	0.69	0.64	0.63	0.653	11th

Table 4.2: Consultants, design and information related factors

II	Consultants, design, and information's related Factors:	Client view	Consultant view	Contractor view	Average	
		RII	RII	RII	RII	Rank
1	Experience of the consultant	0.88	0.86	0.85	0.863	1st
2	Clearness of component of drawings and specifications	0.81	0.81	0.82	0.813	2nd
3	Accuracy of evaluated quantity take off	0.8	0.78	0.83	0.803	3rd
4	Change in Drawing and/or specifications	0.77	0.79	0.82	0.793	4th
5	Level of consultant Communications with owner	0.74	0.75	0.78	0.757	5th
6	The volume of the specialist's task at hand during estimation	0.78	0.76	0.72	0.753	6th
7	Designers Level of education/technology usage	0.71	0.71	0.77	0.730	7th
8	Communications and coordination with consultants	0.72	0.74	0.72	0.727	8th
9	Buildability of design and constructability	0.71	0.73	0.67	0.703	9th
10	Level specialist Communications with providers	0.68	0.67	0.72	0.690	10th

Table 4.3: Cost evaluating procedure related factors

III	Cost evaluating Procedure related factors:	Client view	Consultant view	Contractor view	Average	
		RII	RII	RII	RII	Rank
1	Estimator's experience level	0.82	0.81	0.86	0.830	1st
2	Accessibility of database of offers on a comparative task or Historical cost information	0.79	0.78	0.82	0.797	2nd
3	Accuracy of information gathered from the site before the estimation	0.75	0.76	0.77	0.760	3rd
4	Strategy for refreshing cost data	0.76	0.71	0.78	0.750	4th
5	Accuracy of presumptions made in setting up the estimation	0.72	0.76	0.74	0.740	5th
6	Accuracy and trustworthiness of cost data/Completeness of cost data	0.67	0.71	0.78	0.720	6th
7	The time considered for setting up the cost estimate	0.71	0.69	0.74	0.713	7th
8	Accessibility of productivity standards	0.69	0.71	0.74	0.713	8th
9	Estimating method/techniques used	0.68	0.72	0.70	0.700	9th
10	The problem of reading/ interpreting of the design for real work	0.68	0.71	0.71	0.700	10th
11	Poor cost management during construction work	0.68	0.70	0.70	0.693	11th
12	Number of estimating staff	0.68	0.71	0.69	0.693	12th
13	The method used in determining contingency	0.67	0.69	0.69	0.683	13th
14	Tax and insurance calculation method and consideration	0.66	0.69	0.69	0.680	14th

Table 4.4: Project attributes related factors:

IV	Project attributes related factors:	Client view	Consultant view	Contractor view	Average	
		RII	RII	RII	RII	Rank
1	Project magnitude and multifaceted nature of the construction	0.75	0.78	0.76	0.763	1st
2	Competent and leadership of the project manager	0.76	0.75	0.74	0.750	2nd
3	Project Duration	0.73	0.71	0.77	0.737	3rd
4	Location of project	0.71	0.72	0.75	0.727	4th
5	Construction method / technology /construction techniques	0.69	0.72	0.74	0.717	5th
6	Site constraints and conditions	0.74	0.66	0.75	0.717	6th
7	Nature of structure	0.68	0.66	0.69	0.677	7th
8	Quality and contents of specification code	0.66	0.64	0.73	0.677	8th
9	Category of project	0.66	0.67	0.66	0.663	9th

Table 4.5: Contract offering related factors:

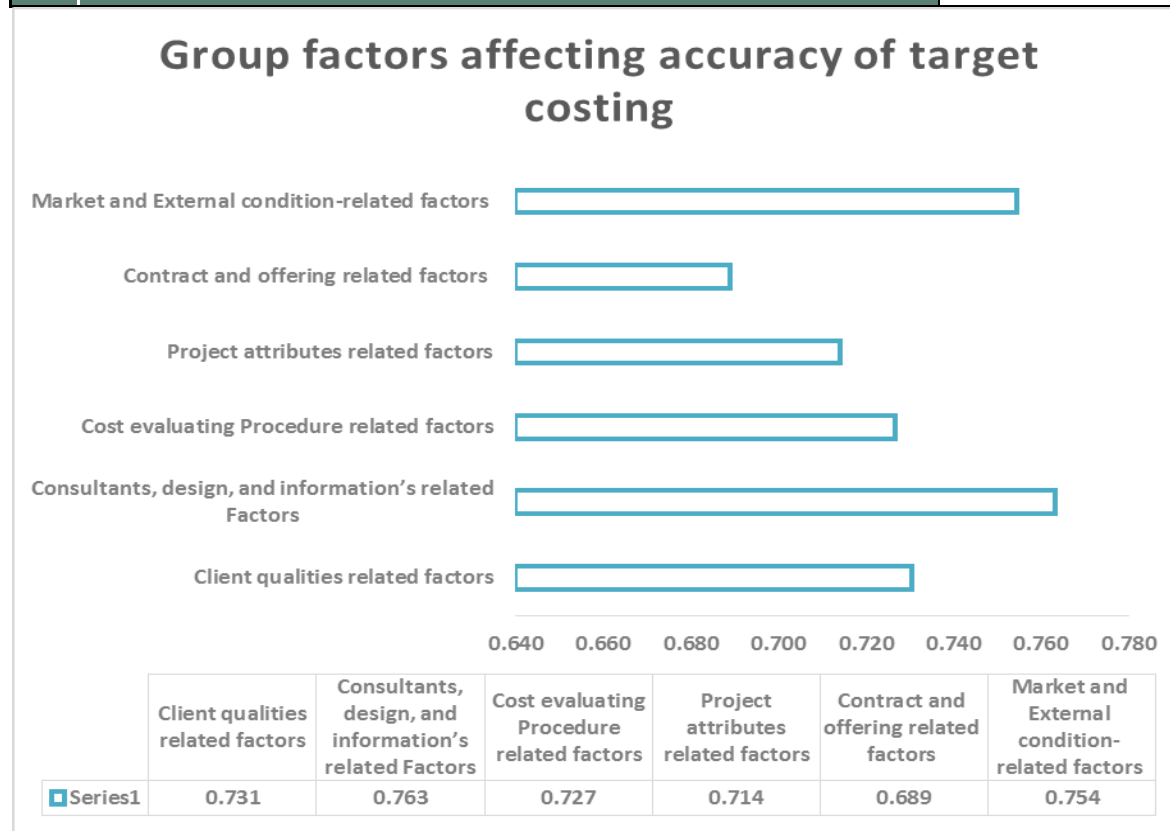
V	Contract and offering related factors :	Client view	Consultant view	Contractor view	Average	
		RII	RII	RII	RII	Rank
1	Clarity of contract conditions	0.8	0.79	0.77	0.787	1st
2	Completeness of tender documents	0.75	0.71	0.8	0.753	2nd
3	Tender selection method	0.78	0.72	0.74	0.747	3rd
4	Type of contract	0.74	0.68	0.73	0.717	4th
5	Level of competitions (Number of competitors) in the tendering	0.69	0.68	0.71	0.693	5th
6	Method of procurement (traditional, design bid build, design and build, project management, etc.)	0.72	0.65	0.67	0.680	6th
7	The taxes and other monetary necessities on tender	0.64	0.58	0.62	0.613	7th
8	Advanced imbursement	0.62	0.59	0.62	0.610	8th
9	The timing of advertisement	0.58	0.58	0.64	0.600	9th

Table 4.6: Market and External condition related factors:

VI	Market and External condition-related factors :	Client view	Consultant view	Contractor view	Average	
		RII	RII	RII	RII	Rank
1	Material price/availability/quality /imports	0.83	0.84	0.94	0.870	1st
2	The economy of the country	0.86	0.81	0.86	0.843	2nd
3	Currency exchange fluctuation	0.81	0.82	0.87	0.833	3rd
4	Political situations/ unpredictability	0.79	0.79	0.82	0.800	4th
5	Equipment availability, productivity, and costs	0.8	0.76	0.82	0.793	5th
6	Labor availability, productivity, and costs	0.79	0.75	0.77	0.770	6th
7	Corruptions	0.69	0.72	0.7	0.703	7th
8	Unexpected condition /Force majeure/unavoidable casualty	0.59	0.62	0.62	0.610	8th
9	Environmental, Social, cultural and religious impact	0.54	0.56	0.6	0.567	9th

Table 4.7: Group factors affecting accuracy of target costing :

I	Client qualities related factors	0.731
II	Consultants, design, and information's related Factors	0.763
III	Cost evaluating Procedure related factors	0.727
IV	Project attributes related factors	0.714
V	Contract and offering related factors	0.689
VI	Market and External condition-related factors	0.754



4.1.1 Most influential factors :

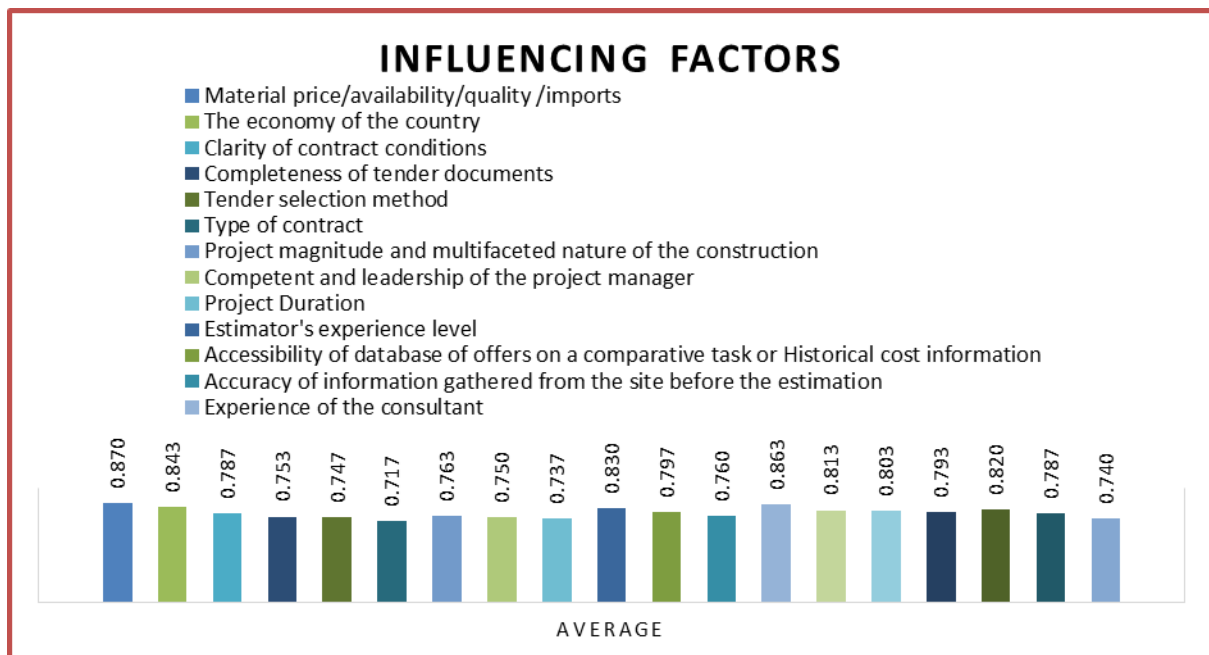


Fig 4.1: Bar chart showing Most influential factors

CHAPTER 5

RECOMMENDATIONS

5.1 RECOMMENDATIONS FOR THE MOST INFLUENTIAL FACTORS:

Table 5.1: Recommendations for the most influential factors

S.NO	MOST INFLUENCING FACTORS	Client view		Consultant view		Contractor view		Average		CATEGORY	RECOMMENDATIONS AND INFERENCES
		RII		RII		RII		RII			
1	Material price/availability/quality /imports	0.83		0.84		0.94		0.870		Market and external condition related factors	Based on CPI and SOR from CPWD the coefficient variable has been arrived for each procurement packages
2	The economy of the country	0.86		0.81		0.86		0.843			
3	Clarity of contract conditions	0.8		0.79		0.77		0.787		Contract and offering related factors	
4	Completeness of tender documents	0.75		0.71		0.8		0.753			Early involvement of Stakeholders and foremen during the tender stage itself may help in arriving at a proper decision in terms of method statement, type of contract and other clarification regarding the project
5	Tender selection method	0.78		0.72		0.74		0.747			
6	Type of contract	0.74		0.68		0.73		0.717			
7	Project magnitude and multifaceted nature of the construction									Project attributes related factors:	Proper framework can be maintained in order to control the cost during execution phase. Kaizen costing is one such recommended solution for integrating target and activity based costing. Kaizen costing is a process of continuous cost management and reduction via better business activities. One of the ideas of kaizen costing is elimination or reduction of non-value-related activities. Kaizen costing is applied to products that have moved to the production stage. Before the production stage, target costing can be utilized to establish and manage costs. The overall idea is that after cost targets have been established, activities are undertaken to gradually improve (reduce) costs while maintaining quality of products or services.
8	Competent and leadership of the project manager	0.75		0.78		0.76		0.763			
9	Project Duration	0.76		0.75		0.74		0.750			
10	Estimator's experience level	0.73		0.71		0.77		0.737			Sufficient time should be given for preparing feasibility studies, planning, design, information documentation and tender submission. This helps avoiding or minimizing late changes. Define the control points and the deliverables : Even if all the stakeholders agree on the importance of respecting the project's budget limits, they may be hard to control along the way and generate cost overruns. To stay in control of a project and maximize its performance, controls must be applied at various key steps. During these control points, the deliverables of a phase are reviewed before going to the next phase. The design reviews and quality control are good examples. These control points are stopping times to give the opportunity to: 1. Re-evaluate the costs 2. Review the margins allocated to budgets and delays 3. Update the project's risks and contingencies.
11	Accessibility of database of offers on a comparative task or Historical cost information	0.82		0.81		0.86		0.830		Cost evaluating Procedure related factors:	
12	Accuracy of information gathered from the site before the estimation	0.79		0.78		0.82		0.797			
13	Experience of the consultant										Establish a change management process and avoid late program changes : Each change proposal must be communicated to the decision-makers before it is applied. Close cross-communication will help the other stakeholders quickly discern the consequences of each change in terms of costs, delays, quality of deliverables, and other collateral aspects. By adequately documenting these changes, the people responsible for the project will be able to authorize it or reject it, as the case may be, in full knowledge of the circumstances. Conduct design review and constructability analyses : The plans and specifications must be analyzed to ensure they are complete. Their content must also be validated before the construction phase. This practice has two objectives: 1. Identify and correct the errors, the omissions and the inconsistencies between disciplines. 2. Verify that the technical solutions chosen are optimal in terms of efficiency and costs over the life cycle of the work.
14	Cleanliness of component of drawings and specifications	0.88		0.86		0.85		0.863		Consultants, design, and information's related Factors:	
15	Accuracy of evaluated quantity take off	0.81		0.81		0.82		0.813			
16	Change in Drawing and/or specifications	0.8		0.78		0.83		0.803			Some contingencies can be maintained for payment delay from client in the initial estimation itself since the delay may increase time and cost overruns in the project
17	Financial conditions of the client	0.77		0.79		0.82		0.793		Client qualities related factors:	
18	Payment delay by the client										
19	Clear degree definition for the owner	0.81		0.82		0.83		0.820			
		0.76		0.78		0.82		0.787			
		0.75		0.75		0.72		0.740			

5.2 ARRIVING AT A COEFFICIENT VARIABLE :

5.2.1 CPI for the construction materials from the year 2000 to 2022:

Table 5.2: CPI for construction materials limiting to shuttering, concreting and reinforcement activity

CEMENT													
Year/month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
2000	99.5	98.8	98.8	98.8	98.8	97.1	93.7	93.7	85.1	89.1	103.8	104.4	96.8
2001	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	104.3	97.8	78.0	101.6
2002	77.7	60.7	77.9	99.6	105.3	97.6	95.3	96.7	96.0	96.0	96.0	97.0	91.3
2003	106.7	108.1	107.8	107.8	106.7	106.7	106.7	106.7	106.7	106.7	106.7	106.7	107
2004	106.7	106.7	106.7	106.7	106.7	105.9	104.2	100.7	97.6	97.4	96.5	95.3	102.6
2005	93.7	94.5	95.5	96.0	96.6	96.4	97.5	96.3	96.3	96.3	96.3	96.3	96
2006	95.9	97.1	97.1	98.1	100.3	100.3	103.3	102.6	102.6	102.6	102.6	102.6	100.4
2007	102.6	102.6	102	102	102	102.7	102.7	101.9	101.9	101.9	101.9	104.6	102.4
2008	105.2	105.4	105.4	108	109.3	109.5	112	112	112.7	112.8	112.3	110.6	109.6
2009	109.1	108.8	107.4	105.4	104.8	102	104.8	114.1	114.1	111.2	109	108.8	108.3
2010	100.7	100.3	98.5	96.6	96.6	95.7	95.7	98.5	100.2	103.9	106.8	106.8	100
2011	109.1	109	109.2	110.5	111.6	110.3	110.3	110.6	110.1	111.4	112.5	111	110.5
2012	109.6	108.9	107.9	107.6	107.7	107.6	108.9	108.9	108.9	108.9	108.9	108.9	108.6
2013	108.9	109.7	110.1	113.8	118.5	118.1	118.5	119.4	119.4	118.1	118.1	118.1	115.9
2014	118.1	118.1	118.1	118.1	116.6	116.6	116.6	116	115.7	115.7	115.7	115.7	116.8
2015	113.8	113.8	113.8	113.8	112.5	112.3	113.2	111.7	111.4	111.4	110.3	108.4	112.2
2016	107.7	107.3	106.8	107.3	107.5	107.5	107	107	107	105.9	105.2	101.8	106.5
2017	100.9	100.8	100.7	100.8	100.8	101.6	103.1	103.4	105.1	103.8	103.8	104.9	102.5
2018	104.9	104.7	104.7	104.7	105.3	105.3	105.6	105.6	105.6	105.2	105.3	105.3	105.2
2019	105.3	105.3	105.3	105.3	105.3	105.4	105.1	105.1	105.1	105.1	105.1	105.1	105.2
2020	105.2	105.2	104.5	104.5	104	104	105.9	104.8	104.8	104.8	104.8	102.8	104.6
2021	102.4	102.4	102.4	102.9	102.9	102.9	103	103	103	104.1	106.1	105.9	103.4
2022	106.7	107	108.1										107.3

IRON PRODUCTS													
Year/month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
2000	53.9	53.9	53.9	54.5	54.7	55.3	55.2	55.2	55.5	55.7	56.3	56.5	55.1
2001	55.5	56.8	57.0	57.7	58.2	59.4	59.8	59.3	58.8	58.5	57.6	57.4	58
2002	58.5	59.6	60.3	61.2	61.2	61.7	63.4	64.2	63.8	63.9	63.4	63.5	62.1
2003	65.5	68.8	72.2	71.5	69.9	69.3	69.4	70.6	70.5	70.7	71.3	75.2	70.4
2004	82.7	90.0	93.0	93.6	90.6	87.4	90.3	96.3	98.9	99.4	97.9	95.6	98
2005	95.6	95.4	95.7	96.0	94.0	87.3	87.1	86.0	87.6	87.5	85.9	84.2	90.2
2006	81.9	81.7	86.5	90.3	92.0	92.4	91.5	89.0	88.9	89.6	91.6	91.2	88.9
2007	89.8	94.0	96.6	96.8	96.9	98.2	97.1	95.3	96.4	101.9	106	107.7	98.1
2008	120.4	129.4	134.2	139.8	162.1	169.6	170.6	160.9	135.6	109.2	99.3	97.4	135.7
2009	91.8	94.0	90.3	89.1	89.0	90.6	94.4	96.9	98.3	97.8	94.6	94.4	93.4
2010	95.3	95.4	96.6	105.5	105.4	100.2	99.5	101.2	101.8	99.0	99.5	100.9	100
2011	107.1	109.1	111.4	112.1	111.9	111.2	112.7	113.1	112.6	112.8	112.3	112.2	111.5
2012	112.2	112.1	112	114	113.9	112.6	110.7	110.1	107.8	105.6	104.7	106.7	110.2
2013	107.8	108.4	108.3	106	103.2	102.4	103	102.8	103.7	104.2	104.5	104.3	104.9
2014	103.9	104.1	104.9	105.5	105.3	105.4	105.3	104.3	103.3	102.4	100.1	98.5	103.6
2015	95.7	92.7	90.9	91.0	90.9	90.2	88.5	87.1	84.5	82.4	80.7	79.2	87.8
2016	79.5	81.6	84.6	90.8	95.3	90.5	83.0	84.0	85.9	84.5	86.2	89.8	86.3
2017	93.5	93.1	92.8	91.8	88.3	88.9	90.8	97.5	102.4	100.3	98.9	98.9	94.8
2018	101.1	100.8	100.5	99.3	99.8	102.7	105.6	106.4	105.2	102.3	102.2	98.6	102
2019	96.3	95.8	96.7	97.6	96.5	94.7	92.5	92.9	89.8	85.2	85.3	86.5	92.5
2020	88.1	86.8	85.5	82.6	82.1	83.8	84.5	83.4	84.9	86.4	87.2	91.2	85.5
2021	104.9	105	105.8	112.4	120.7	120.4	113.7	116.2	116.3	120.4	120.9	117.4	114.5
2022	116.2	119.8	126.7										120.9

Table 5.2: CPI for construction materials limiting to shuttering, concreting and reinforcement activity contd..

WOOD PRODUCTS													
Year/month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
2000	60.2	60.7	60.9	60.9	60.9	60.9	60.9	60.9	60.9	60.9	61.0	61.0	60.8
2001	62.5	63.9	63.2	63.2	63.0	62.9	63.0	63.1	63.6	63.6	63.6	63.6	63.3
2002	64.0	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4	64.4
2003	64.4	66.6	66.6	66.6	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67
2004	67.7	67.7	71.4	71.4	72.0	72.0	72.0	72.0	72.0	72.0	72.0	72.0	71.2
2005	72.0	72.0	72.8	72.8	73.4	74.4	74.4	74.4	74.4	74.4	74.4	74.4	73.7
2006	74.4	75.3	77.6	77.6	77.6	77.7	77.3	77.3	77.3	79.7	79.7	79.7	77.6
2007	79.7	79.7	80.0	80.0	81.0	81.4	81.4	81.4	81.4	81.4	81.4	81.8	80.9
2008	81.8	81.8	81.8	89.2	89.2	89.4	89.4	89.4	89.9	89.5	89.5	89.5	87.5
2009	99.4	99.4	98.2	98.2	98.2	98.2	97.9	97.9	97.9	97.9	97.9	97.9	98.3
2010	98.2	98.2	98.2	98.2	98.2	98.2	101.8	101.8	101.8	101.8	101.8	102.3	100
2011	102.6	102.6	102.6	103.2	103.2	103.2	103.2	103.1	103.1	103.1	103.1	103.1	103
2012	103.1	103.1	103.3	103.3	103.3	103.3	103.3	108.4	108.4	108.4	108.4	108.4	105.4
2013	111.9	112	112	111	110.9	110.9	110.9	110.9	110.9	111.1	111.1	111.1	111.2
2014	111.1	111.1	111.1	111.1	111.1	111.1	112.1	112.1	112.1	112.1	112.1	112.1	111.6
2015	112.1	112.8	112.8	112.8	112.8	112.8	112.8	112.8	112.8	112.8	112.8	112.8	112.7
2016	111.6	111.6	111.6	111.6	111.6	111.6	111.6	111.6	111.6	111.6	111.6	111.6	111.6
2017	112.1	112.1	115.8	116.2	116.3	116.3	116.3	116.5	116.5	116.5	116.5	116.5	115.6
2018	116.5	116.7	116.7	116.7	116.7	116.7	116.7	116.7	116.7	116.7	116.7	118.1	116.8
2019	124.4	129.2	129.7	129.8	129.8	129.8	129.8	129.8	129.8	129.8	129.8	129.8	129.3
2020	129.8	129.8	129.8	129.8	129.8	129.8	129.8	129.8	129.8	129.9	129.9	129.9	129.8
2021	130.2	132.4	132.4	132.4	132.4	132.4	132.4	132.4	132.4	132.4	132.4	132.4	132.2
2022	137	137.1	138.2										137.4

PAINTING PRODUCTS													
Year/month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
2000	73.9	73.8	76.1	76.1	76.1	76.4	76.4	76.4	76.6	76.6	76.6	76.6	76
2001	77.8	77.5	77.5	79.0	79.0	78.6	78.6	78.6	81.9	82.6	82.6	82.6	79.7
2002	82.6	82.6	82.6	82.6	82.6	82.6	82.6	82.6	82.6	82.6	82.6	82.6	82.6
2003	82.6	82.6	82.6	82.6	82.6	82.6	82.6	84.8	84.8	84.8	84.8	84.8	83.5
2004	85.3	85.3	85.3	85.3	85.3	85.3	85.3	85.3	85.3	85.3	85.3	85.3	85.3
2005	85.7	85.7	86.4	86.4	86.4	86.4	87.9	87.9	90.4	90.4	90.4	91.1	87.9
2006	91.1	90.5	90.5	90.5	90.8	90.8	90.6	90.5	90.5	90.5	89.8	89.8	90.5
2007	89.8	89.8	89.8	89.8	89.8	89.8	89.8	89.8	89.8	89.8	89.8	89.8	89.8
2008	89.8	91.4	91.4	91.4	91.4	91.7	91.7	92.0	92.6	93.3	99.6	99.6	98
2009	99.6	99.7	99.7	99.7	99.7	99.7	98.6	98.6	98.6	100	100	100	99.5
2010	100	100	100.3	100.3	100.3	100.3	99.5	99.5	99.7	99.7	99.7	100	99.9
2011	100	100	100	100	100	101.3	103.6	105.3	105.3	105.3	105.3	103.9	102.5
2012	104.7	104.9	104.9	104.9	104.9	104.5	104.9	105	105	105	105.8	105.8	105
2013	106.9	106.9	106.9	106.9	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.5
2014	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3
2015	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3
2016	106.3	106.3	106.3	106.3	106.3	106.3	106.3	106.3	108.2	108.2	108.2	108.2	106.9
2017	108.2	108.4	108.4	108.4	108.4	108.4	108.4	108.4	108.4	108.4	108.4	108.1	108.4
2018	108.1	108.1	108.1	108.1	108.1	108	108.1	108.3	108.3	108.3	108.3	108.3	108.2
2019	108.3	108.3	108.4	108.4	108.5	108.2	108.2	108.1	108.1	108.1	108.3	108.3	108.3
2020	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.7	108.6	108.6	108.6	108.7
2021	108.6	108.6	108.6	108.6	108.6	108.6	108.6	108.6	108.6	108.7	108.7	108.7	108.6
2022	109.8	109.8	109.8										109.8

Table 5.2: CPI for construction materials limiting to shuttering, concreting and reinforcement activity contd..

CONCRETE INGREDIENTS													
Year/month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Average
2000	88.4	87.5	86.8	86.8	86.8	88.0	88.8	88.8	88.5	88.5	88.8	88.8	88
2001	92.5	92.5	92.5	92.5	92.5	92.5	92.5	92.5	94.0	94.0	94.0	93.6	93
2002	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6
2003	93.6	93.6	93.6	93.6	93.6	93.6	94.5	94.7	94.7	94.7	94.7	94.3	94.1
2004	94.3	94.3	94.7	94.7	95.4	95.4	95.4	95.4	94.9	96.3	96.3	96.3	95.3
2005	96.3	97.9	97.9	97.9	98.2	95.8	96.3	97.6	97.6	97.3	97.1	100.8	97.6
2006	100.8	100.8	100.9	101	101.1	101.1	101.1	101.6	101.6	101.6	101.6	101.6	101.2
2007	101.4	101.4	103.1	103.1	103.1	103	103	102.6	102.6	102.4	102.4	102.5	102.6
2008	102.8	102.8	103.2	106.5	107.8	109.5	109.6	109.6	112	112	106.1	103.5	107.1
2009	103.2	102.9	102.4	100.5	99.9	100.3	100.6	100.6	101.3	101.3	100.9	101.1	101.3
2010	100.6	100.5	100.7	99.0	99.4	99.4	99.4	99.7	99.7	100.3	100.5	101.3	100
2011	101.3	101.1	101.6	101.8	103	103	103	103	103.8	107.8	109.8	112.7	104.3
2012	112.7	113.6	118.3	120.9	120.9	122.9	123.8	123.8	123.8	123.8	123.8	123.9	121
2013	124	124.3	124.4	125.9	126	126.1	126.3	126.4	127.5	130.8	130.8	131.6	127
2014	131.6	131.6	131.6	131.6	131.6	131.6	131.6	131.6	131.6	131.6	131.6	131.6	131.6
2015	131.2	131.2	131.2	131.2	131.1	130.8	130.5	130.5	129.5	128.4	128.3	128.3	130.2
2016	128.2	128.2	128.4	128.4	127.4	127.4	128.2	128.2	128.2	128.2	128.2	128.2	128.1
2017	127.8	126.9	126.8	127.8	129.6	129.6	128.9	129.3	130	131	131	131.6	129.2
2018	131.5	131.7	131.8	131.8	131.8	131.9	131.9	132	132	132	132	132	131.9
2019	134.2	134.5	134.5	134.5	134.6	134.6	134.3	134.3	134.3	133.9	133.6	133.3	134.2
2020	133.3	132.9	132.3	131.1	131	131.3	131.7	131.7	130.6	130.6	130.6	130.9	131.5
2021	131.6	132.2	132.8	132.8	134.4	134.8	135.2	135.9	136.1	137.5	138.4	138.2	135
2022	139	139.2	140.8										139.7

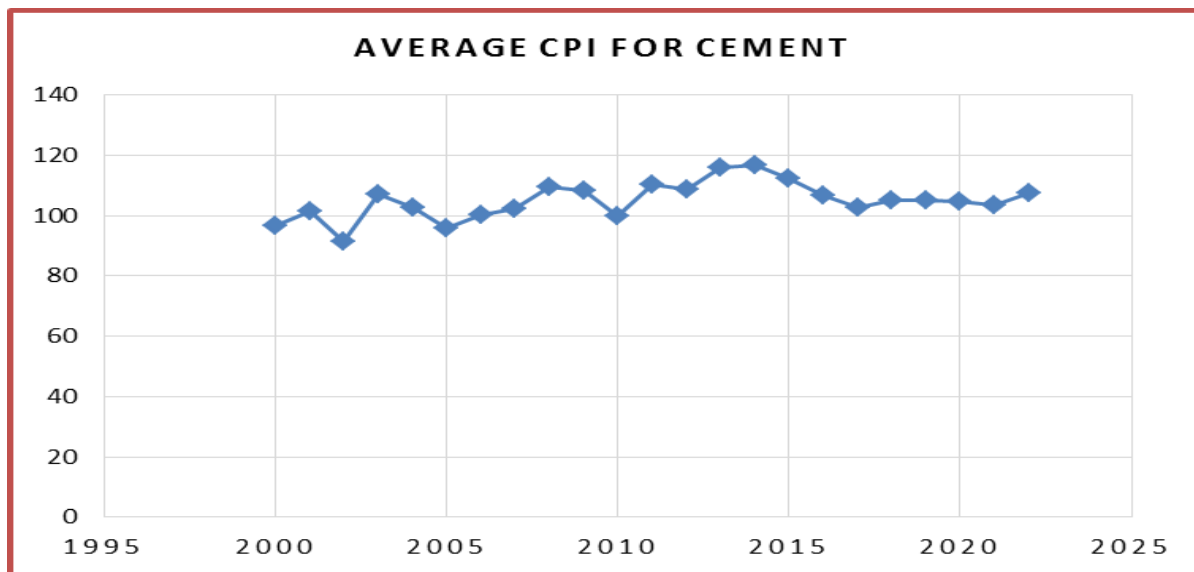


Fig 5.1: Graph showing the fluctuation in CPI for cement

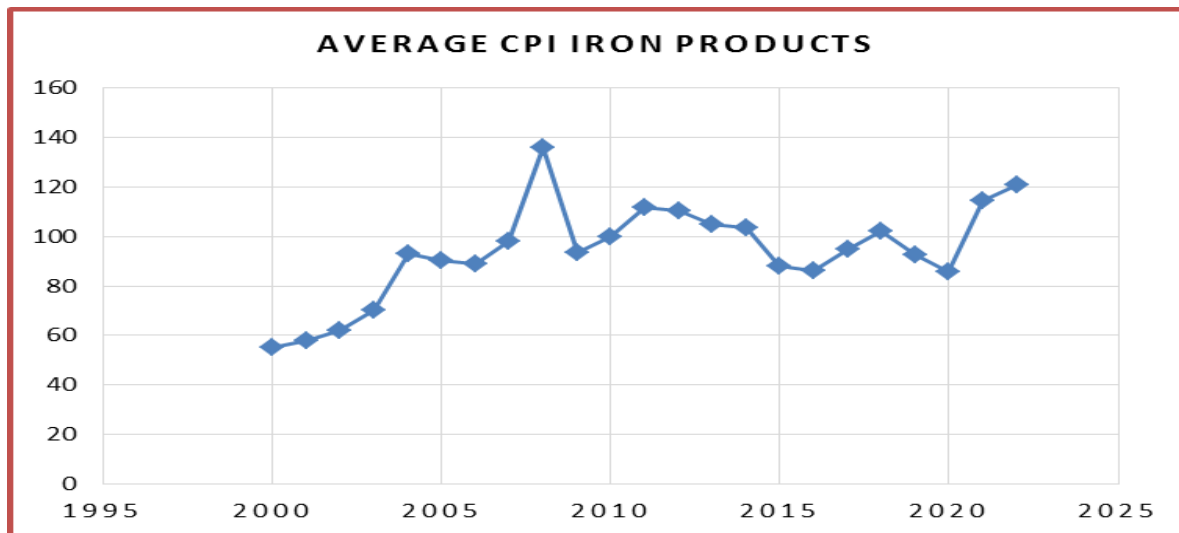


Fig 5.2: Graph showing the fluctuation in CPI for Iron products

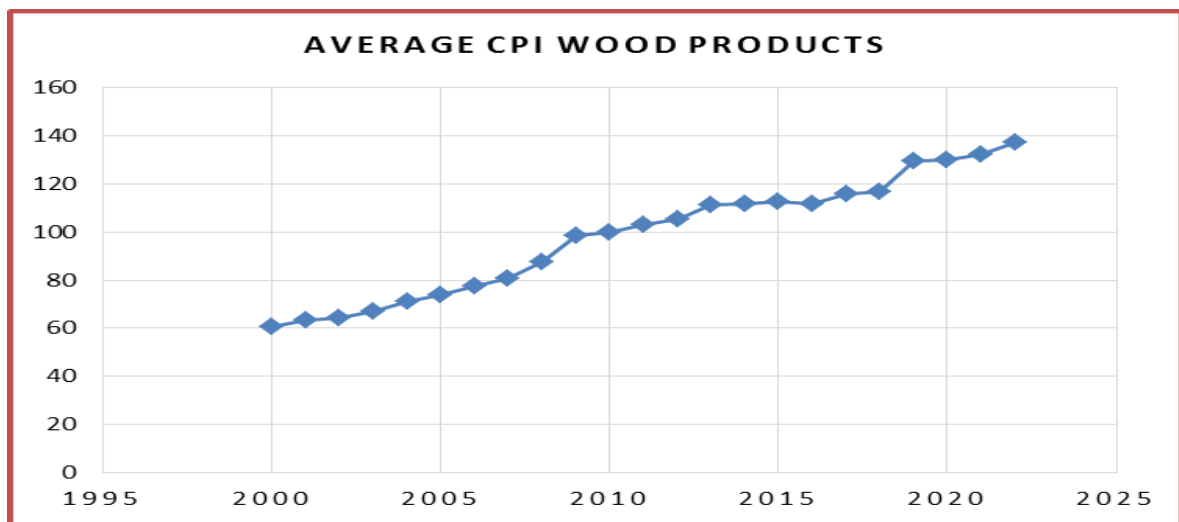


Fig 5.3: Graph showing the fluctuation in CPI for Wood products

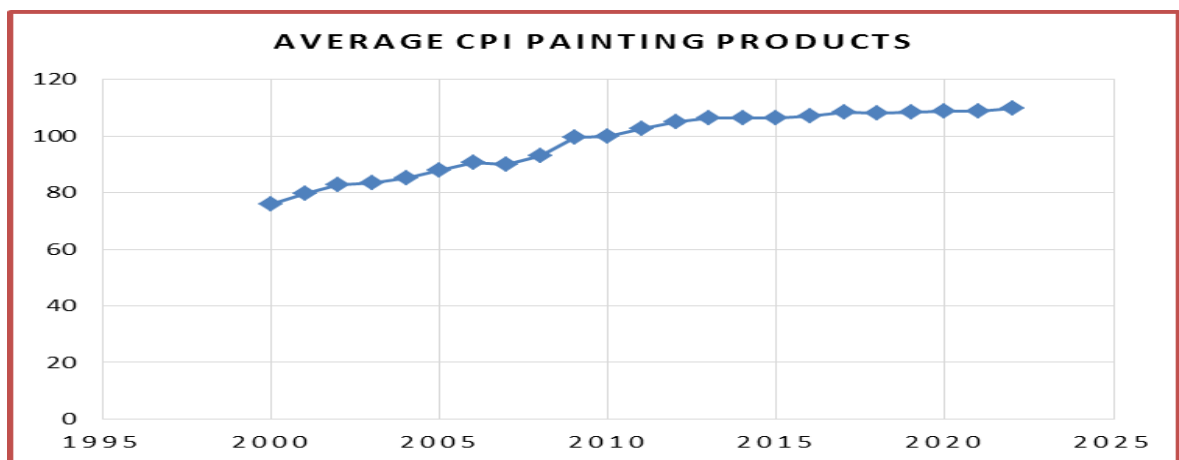


Fig 5.4: Graph showing the fluctuation in CPI for Painting products

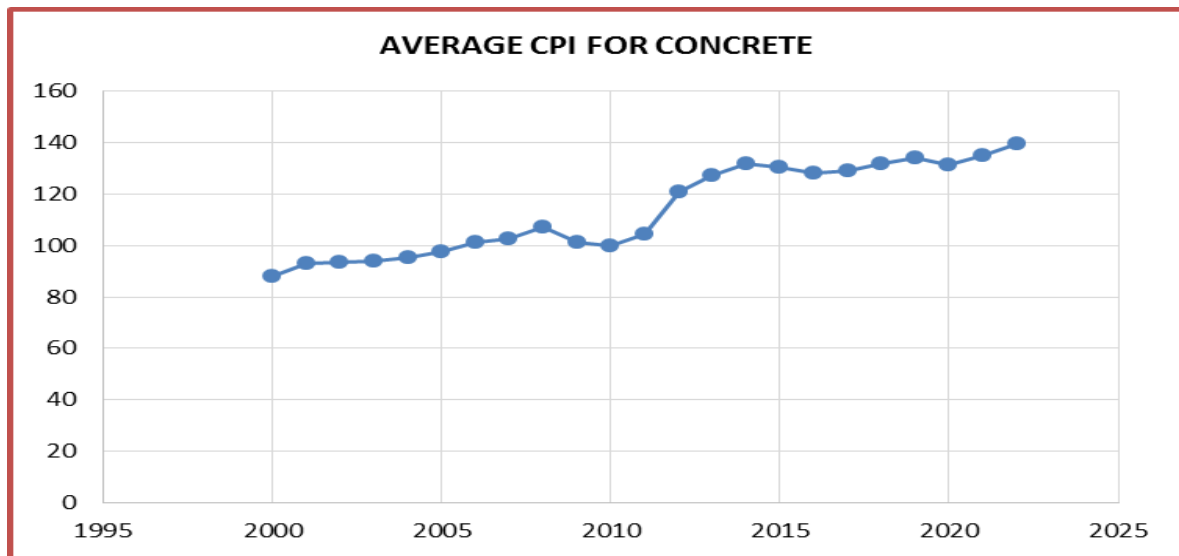


Fig 5.5: Graph showing the fluctuation in CPI for Concrete products

5.2.2 Arriving at the coefficient variable :

Table 5.3: Coefficient variable for labour :

COEFFICIENT VARIATION										
S.NO	SKILLED LABOR	UNIT	AMOUNT				MEAN	STANDARD DEVIATION		COEFFICIENT VARIATION (Mean/SD)x100%
			2017-2018	2018-2019	2019-2020	2020-2021	2021-2022	$\frac{\sum (x - \bar{x})^2}{n - 1}$	$\frac{\sqrt{\sum (x - \bar{x})^2}}{n - 1}$	
1	Carpenter - I Class	DAY	504.73	555	638	752	842	658.346		
	$(x - \bar{x})^2$		23597.8755	10680.39572	413.959716	8771.071716	33728.79172	-	19298.02	138.92
2	Carpenter - II Class	DAY	462.12	508	575	700	800	609.024		
	$(x - \bar{x})^2$		21580.7852	10205.84858	1157.632576	8276.632576	36471.83358	-	19423.18	130.37
3	Fitter (Pipe Laying / Bar bending) - I Class	DAY	448.86	493	566	667	747	584.372		
	$(x - \bar{x})^2$		18363.5021	8348.842384	337.530384	6827.386384	26447.86638	-	15081.28	122.81
4	Fitter (Pipe Laying / Bar bending) - II Class	DAY	416.67	458	500	600	700	534.934		
	$(x - \bar{x})^2$		13986.3737	5918.840356	1220.384356	4233.584356	27246.78436	-	13151.49	114.68
5	Hammer Mazdoor	DAY	320.08	352	404	476	533	417.016		
	$(x - \bar{x})^2$		9396.5881	4227.080256	169.416256	3479.112256	13452.28826	-	7681.12	87.64
6	Mason for Brick Work-I Class	DAY	516.1	567	652	769	861	673.02		
	$(x - \bar{x})^2$		24623.8864	11240.2404	441.8404	9212.1604	35336.4804	-	20213.65	142.17
7	Mason for Brick Work-II Class	DAY	462.12	508	600	700	800	614.024		
	$(x - \bar{x})^2$		23074.8252	11241.08858	196.672576	7391.872576	34587.07258	-	19122.88	138.29
8	Painter / Varnisher - I Class	DAY	412.88	454	522	615	688	538.376		
	$(x - \bar{x})^2$		15749.246	7119.309376	268.173376	5871.237376	22387.34138	-	12948.83	113.35
9	Painter / Varnisher - II Class	DAY	383.52	421	450	500	600	470.904		
	$(x - \bar{x})^2$		7635.96346	2490.409216	436.977216	846.577216	16665.77722	-	7018.93	83.78
AVERAGE COEFFICIENT VARIATION FOR LABOUR RATE IN %										21.11

Table 5.4: Coefficient variable for materials :

Sl.NO	MATERIALS	UNIT	AMOUNT					MEAN $\bar{x} = \frac{\sum x}{n}$	STANDARD DEVIATION		COEFFICIENT VARIATION (Mean/SD)x100%	AVERAGE COEFFICIENT VARIATION IN MATERIAL RATE IN %
			2017-2018	2018-2019	2019-2020	2020-2021	2021-2022		$\frac{\sum (x - \bar{x})^2}{n - 1}$	$\frac{\sqrt{\sum (x - \bar{x})^2}}{n - 1}$		
1	Second Class Table Moulded Chamber Burnt Bricks											
	a. 9" x 4 1/2" x 3"	1000Nos	6847.62	7085	7435	7509	7695	7314.324				
	(x - $\bar{x}$) ²		217812.624	52589.49698	14562.69698	37898.74498	144914.217	-	116944.44		4.68	
	b. 9" x 4 3/8" x 2 3/4"	1000Nos	6580.95	6810	7150	7221	7400	7032.39				
	(x - $\bar{x}$) ²		203798.074	49457.3121	138932.1121	35573.7321	135137.1121	-	109449.59		4.70	
2	Second Class Ground Moulded Chamber Burnt Bricks											
	a. 9" x 4 1/2" x 3"	1000Nos	5895.24	6100	6405	6469	6630	6299.848				
	(x - $\bar{x}$) ²		163707.634	39939.2331	11056.9431	28612.3991	109000.3431	-	88079.14		4.71	
	b. 9" x 4 3/8" x 2 3/4"	1000Nos	5728.57	5925	6220	6282	6435	6118.114				
	(x - $\bar{x}$) ²		151744.528	37293.017	10380.757	26858.621	100416.737	-	81673.41		4.67	4.69
3	Fly Ash Bricks											
	a. 230 x 110 x 70mm	1000Nos	5207.79	5925	6220	6282	6435	6013.958				
	(x - $\bar{x}$) ²		649906.844	7913.525764	42453.30576	71846.51376	17776.3658	-	237349.14		8.10	
	b. 230 x 110 x 75mm	1000Nos	5359.31	6100	6405	6469	6630	6192.662				
	(x - $\bar{x}$) ²		694475.556	8586.246244	45087.42624	76362.69024	191264.5262	-	253944.11		8.14	
4	Perforated Bricks 19 x 9 x 9cm	1000Nos	3352.38	3465	3635	3671	3760	3576.676				8.12
			50308.6956	12471.52898	3401.688976	8897.016976	33607.68898	-	27171.65		4.61	4.61
5	Hard Broken Granite Stone Jelly (I.S.S.) Machine crushed / Hand broken											
	HBGS Jelly 50mm size	Cu.m	572.38	598	630	645	661	621.276				
	(x - $\bar{x}$) ²		2390.81882	541.772176	76.108176	562.828176	1577.996176	-	1287.38		35.88	5.78
	HBGS Jelly 40mm size	Cu.m	889.52	929	980	1004	1029	966.304				
	(x - $\bar{x}$) ²		5895.78266	1391.588416	187.580416	1420.988416	3930.788416	-	3206.68		56.63	5.86
	HBGS Jelly 25mm size	Cu.m	764.76	799	842	863	884	830.552				
	(x - $\bar{x}$) ²		4328.58776	995.528704	131.056704	1052.872704	2856.688704	-	2341.18		48.39	5.83
	HBGS Jelly 20mm size	Cu.m	1238.1	1293	1364	1398	1432	1345.02				
	(x - $\bar{x}$) ²		11431.8864	2706.0804	360.2404	2806.8804	7565.5204	-	6217.65		78.85	5.86
	HBGS Jelly 12mm size	Cu.m	1148.57	1200	1266	1297	1329	1248.114				
	(x - $\bar{x}$) ²		9909.00794	2314.956996	319.089996	2389.840996	6542.544996	-	5369.06		73.27	5.87
	HBGS Jelly 10mm size	Cu.m	845.71	883	931	954	977	918.142				
	(x - $\bar{x}$) ²		5246.39462	1234.960164	165.328164	1285.796164	3464.264164	-	2849.19		53.38	5.81
7	Sand for Mortar	Cu.m	168	168	447	447	447	335.4				
	(x - $\bar{x}$) ²		28022.76	28022.76	12454.56	12454.56	12454.56	-	23352.30		152.81	45.56
8	Sand for Filling	Cu.m	168	168	447	447	447	335.4				
	(x - $\bar{x}$) ²		28022.76	28022.76	12454.56	12454.56	12454.56	-	23352.30		152.81	45.56
9	Pond Ash (wet / dry)	Cu.m	84.19	88	92	92.9	94.7	90.358				
	(x - $\bar{x}$) ²		38.044224	5.560164	2.696164	6.461764	18.852964	-	17.90		4.23	4.68
6	Plastering Sand (P-Sand)	Cu.m		883	1255	1255	1285	1169.5				
	(x - $\bar{x}$) ²			82082.25	7310.25	7310.25	13340.25	-	36681.00		191.52	16.38
10	Crushed Stone Sand (Commercially called M-Sand)	Cu.m	434.29	777	1250	1250	1280	998.258				
	(x - $\bar{x}$) ²		318059.905	48955.10256	63374.03456	63374.03456	79378.55456	-	143285.41		378.53	37.92
11	SRC Cement (Sulphate Resistant Cement)	50 Kgs. / Bag	282	290	300	300	308	296				
	(x - $\bar{x}$) ²		196	36	16	16	144	-	102.00		10.10	3.41
12	Slag Cement 50 Kgs. / Bag 277.00	50 Kgs. / Bag	250	255	262	270	277	262.8				
	(x - $\bar{x}$) ²		163.84	60.84	0.64	51.84	201.64	-	119.70		10.94	4.16
13	White Cement	Kg	20.03	22	22	22.2	22.4	21.726				

5.2.3 Current trend in construction :

Table 5.5: Current trend in construction based on the survey results:

CURRENT PRACTICES	
SCHEDULING TECHNIQUES	UTILIZATION %
Gantt chart	51
Line of balance	16
Critical path method	13
No specific technique is used	10
Program evaluating and review technique	10
Precedence diagram method	0
CURRENTLY USED PACKAGES FOR PLANNING AND CONTROL	UTILIZATION %
Microsoft project	43
Primavera	22
Microsoft Excel	16
No specific technique is used	16
Building information modelling	3
CURRENTLY USED METHOD FOR COST CONTROL	UTILIZATION %
Unit costing (Periodic assessment of each item in BOQ)	33
By overall profit or loss (Assessment at completion date)	29
Profit/Loss at valuation dates (Assessment at each payment)	17
Activity based ratio (Periodic assesment of each activity)	9
No specific technique is used	6
Leading parameter(Periodic assessment of the main item)	3
System Variance(Periodic analysis of S-Curve variances)	3

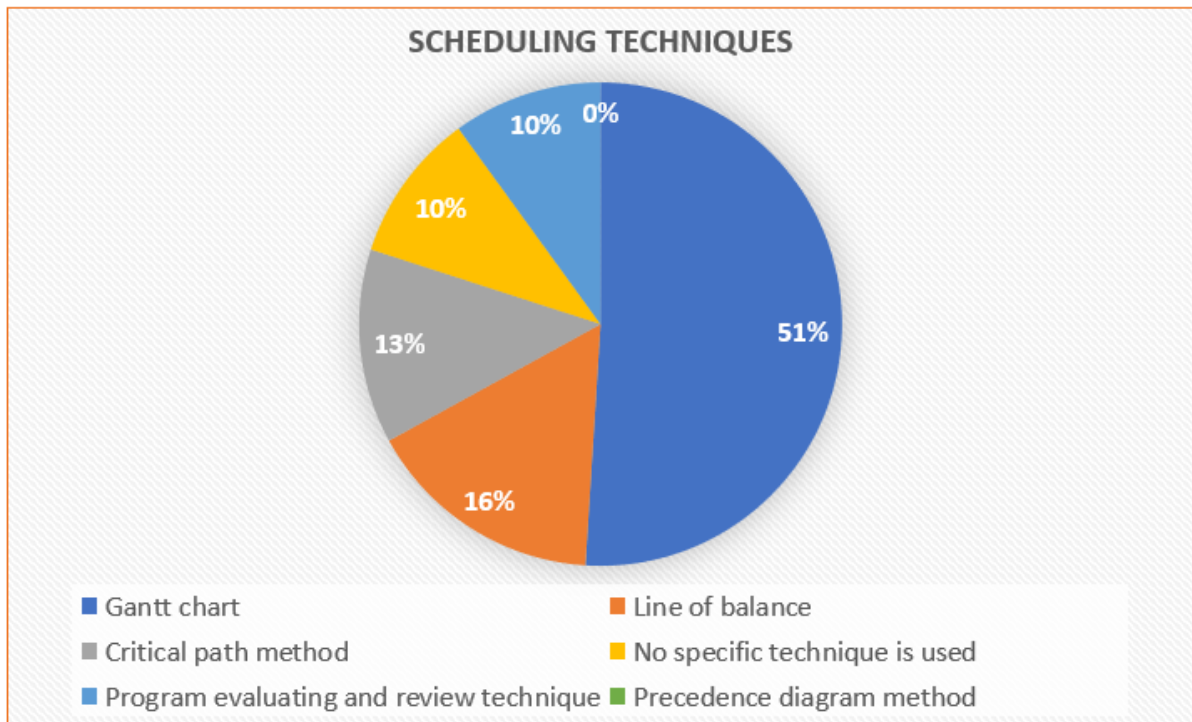


Fig 5.6: Pie chart showing the current trend in scheduling

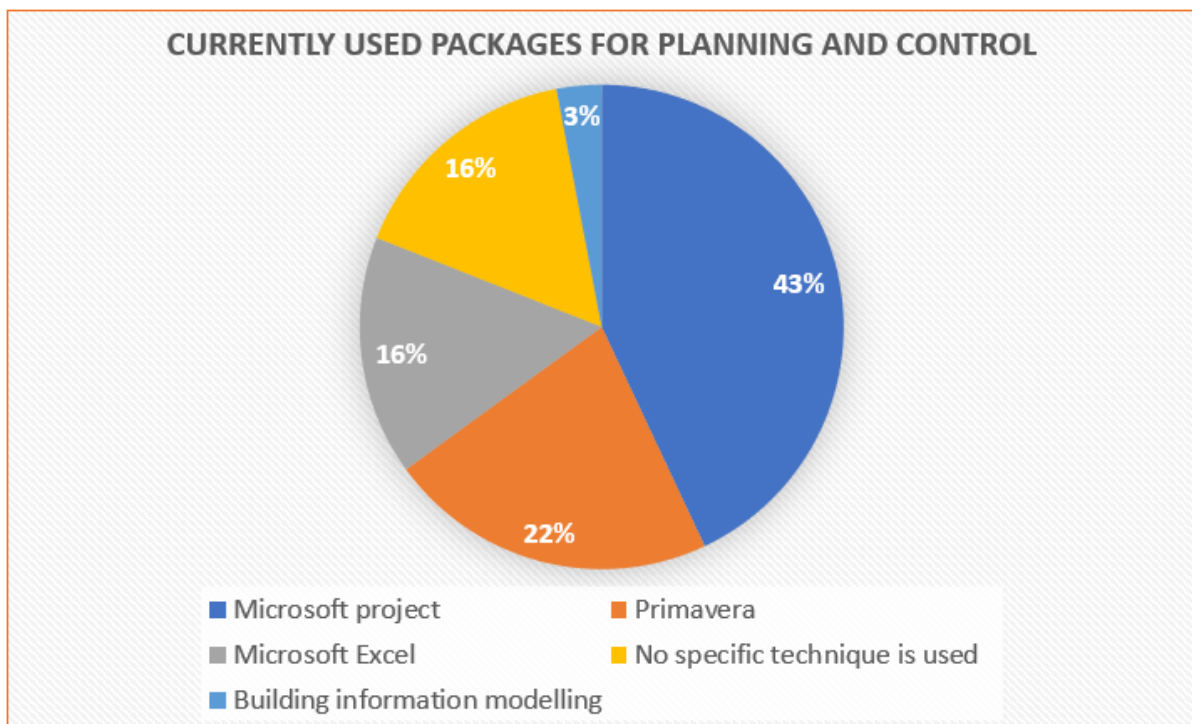


Fig 5.7: Pie chart showing the current trend in Planning and control

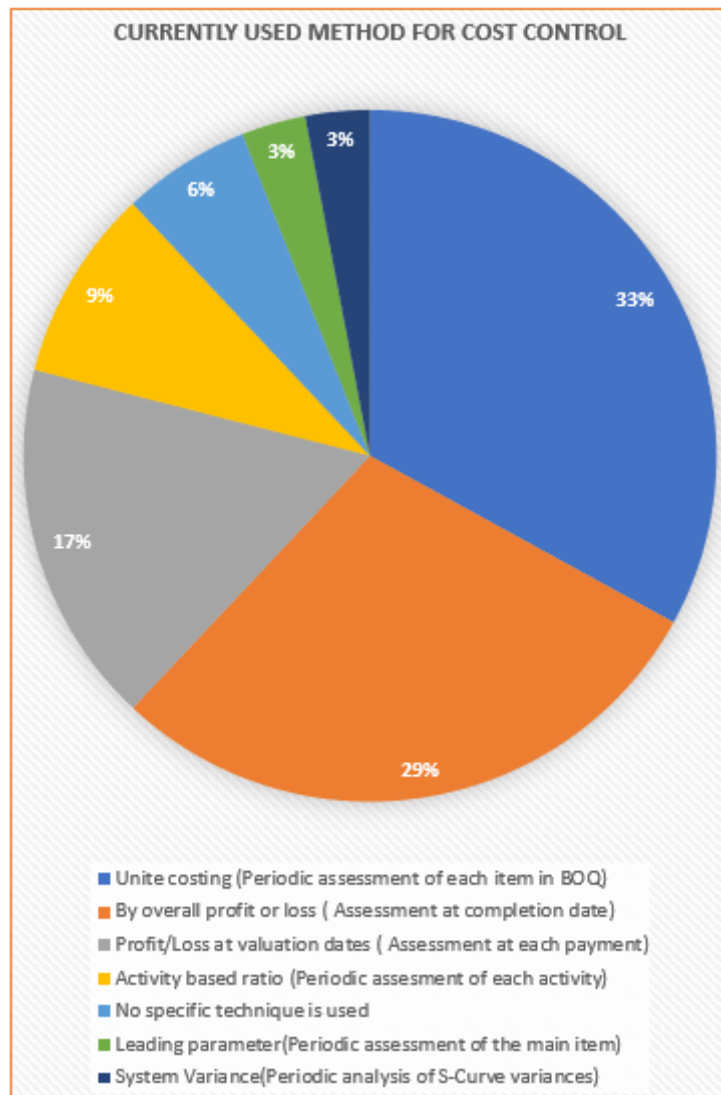


Fig 5.8: Pie chart showing the current trend in Cost control

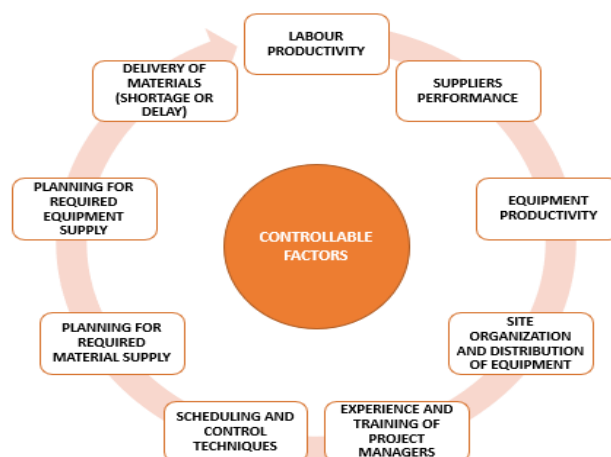


Fig 5.9: Controllable factors in cost overruns:

5.2 APPLICATION OF COEFFICIENT VARIABLE :

Table 5.6: Application of coefficient variable to the estimated cost and comparing actual and newly proposed estimated costing:

ESTIMATED VS ACTUAL (7 TH FLOOR SLAB)										
		ESTIMATED				ACTUAL				
										REASON FOR VARIANCE
S.NO	DESCRIPTION OF WORK	UNIT	QTY	RATE	AMOUNT	UNIT	QTY	RATE	AMOUNT	
1	FORMWORK : RMDK - (Kwikstage, Rapidshor and Alshor plus) - Rapid climb system using GTX and super slim soldiers									
	Providing, Fabricating and erecting form work at all levels and places wherever needed/specified as per drawing including striking with 18mm plastic coated marine resistant waterproof ply with adjustable steel props of acceptable staging system and with sufficient bracing as approved by PMC. Cost to include designing of proper form work and staging system to suit the requirements. Submission of design calculations and shop drawings for approval. Sealing the joints with heavy duty brown self adhesive tape, aligning to line and levels including M.S ties, PVC Spacer. Providing openings/Cutouts, applying deshuttering chemical, Deshuttering as approved by the PMC etc. Complete at all levels, Heights and profiles. A chambers required shall be considered at terrace level as per PMC instructions									ALU FORM WORK WAS USED FOR CORE WALLS IN TOWER AREA AND CONVENTIONAL FORM WORK WAS USED SLABS, BEAMS AND COLUMNS.
	Rates for each element									
	Columns	Sq.m	87.21	600	52326	Sq.m	87.21	650	56686.5	

	Core walls/ Retaining walls	Sq.m	809.47	900	728523	Sq.m	809.47	1200	971364	
	Slab and beams	Sq.m	586.67	600	352002	Sq.m	586.67	650	381335.5	
2	CONCRETING: Providing and laying reinforced ready mixed concrete and machine mixed design for the following grades using coarse graded aggregate of 20mm and down size for the following members of all shapes, at all levels excluding necessary centering, Shuttering and reinforcement which shall be measured and paid seperately under relevant items, all lead and lifts, tools and plants, pumping the concrete to all levels, curing, etc complete as directed by the KEIPL/PM. M-30 Grade									QUALITY ISSUES AND RECTIFICATION WORK. WHICH CAUSED DELAY IN PROJECT AND CHANGE IN MATERIAL PRICE
	Rates for each element									
	Columns	Cu.m	4.261	6800	28974.8	Cu.m	4.261	7800	33235.8	
	Core walls/ Retaining walls	Cu.m	122.38	6800	832197.6	Cu.m	122.38	7800	954579.6	
	Slab and beams	Cu.m	343.37	6800	2334916	Cu.m	343.37	7800	2678286	
3	STEEL : Suppling and fixing of steel as per drawing and specification as given in approved make inclusive of barbending works for the following elements.									MARKET PRICE OF STEEL GOT ESCALATED. INITIALLY IT WAS COST PLUS CONTRACT LATER IT WAS MADE LUMP SUM CONTRACT AND SO THE CONTRACTOR
	Rates for each element									
	Columns	MT	20.4	70000	1428000	MT	20.4	105000	2142000	

	Core walls/ Retaining walls	MT	23.7	70000	1659000	MT	23.7	105000	2488500	NEED TO BEAR THE LOSS. MINIMUM WASTAGE CONSIDERED WAS 3% BUT ESCALATED UPTO 8%
	Slab and beams	MT	24.3	70000	1701000	MT	24.3	105000	2551500	
	TOTAL				9116939				12257487.4	

Table 5.6: Application of coefficient variable to the estimated cost for form work:

MATERIAL COST	COEFFICIENT VARIATION	MATERIAL COST (AFTER)	LABOUR COST	COEFFICIENT VARIATION	LABOUR COST (AFTER)	TOTAL COST PER SQ.M
372	0.0923	406.3356	228	0.211	276.108	682.4436
558	0.0923	609.5034	342	0.211	414.162	1023.6654
372	0.0923	406.3356	228	0.211	276.108	682.4436

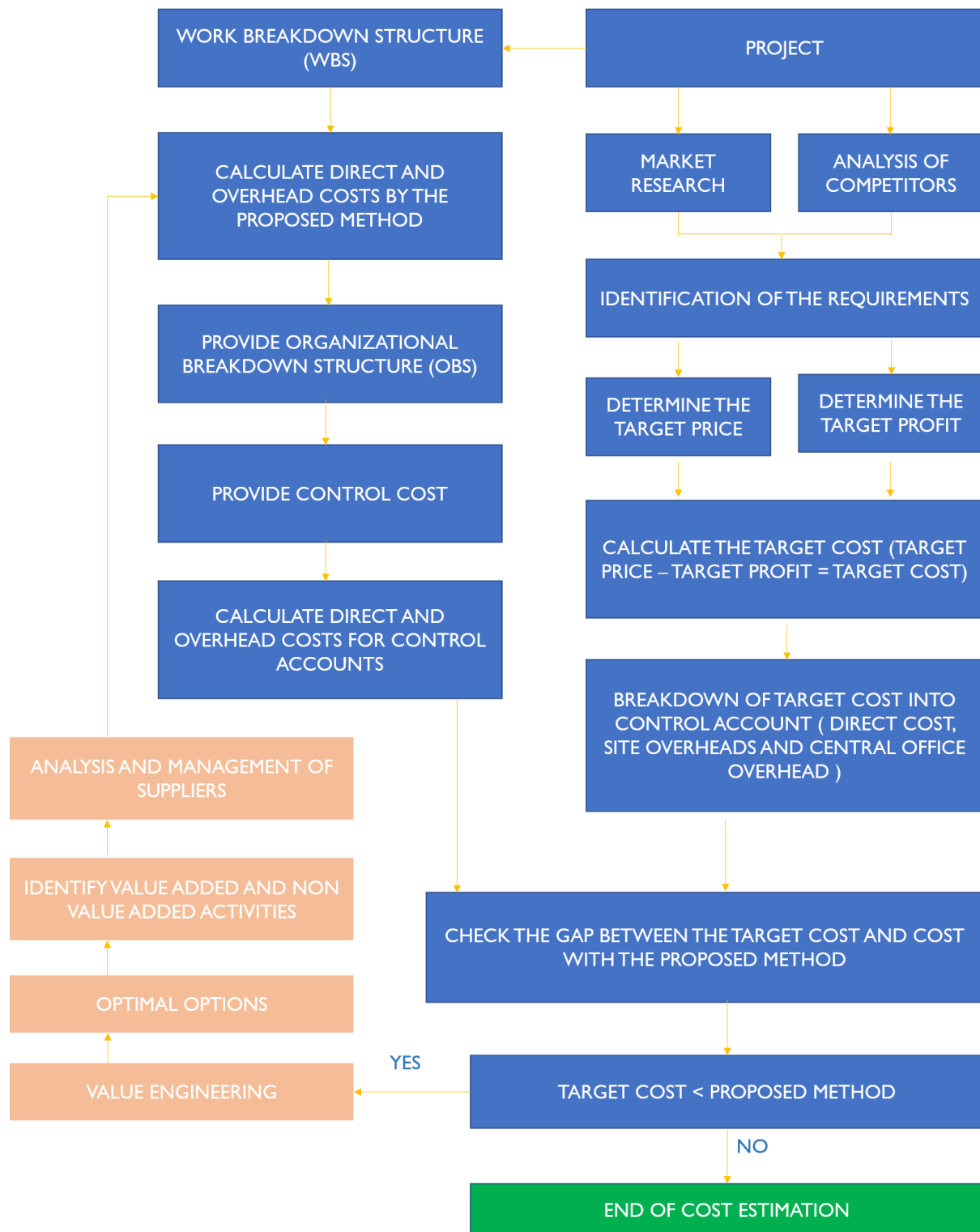
Table 5.7: Application of coefficient variable to the estimated cost for Concreting :

MATERIAL COST	COEFFICIENT VARIATION	MATERIAL COST (AFTER)	LABOUR COST	COEFFICIENT VARIATION	LABOUR COST (AFTER)	TOTAL COST PER CUM
5712	0.1526	6583.6512	1088	0.211	1317.568	7901.2192
5712	0.1526	6583.6512	1088	0.211	1317.568	7901.2192
5916	0.1526	6818.7816	884	0.211	1070.524	7889.3056

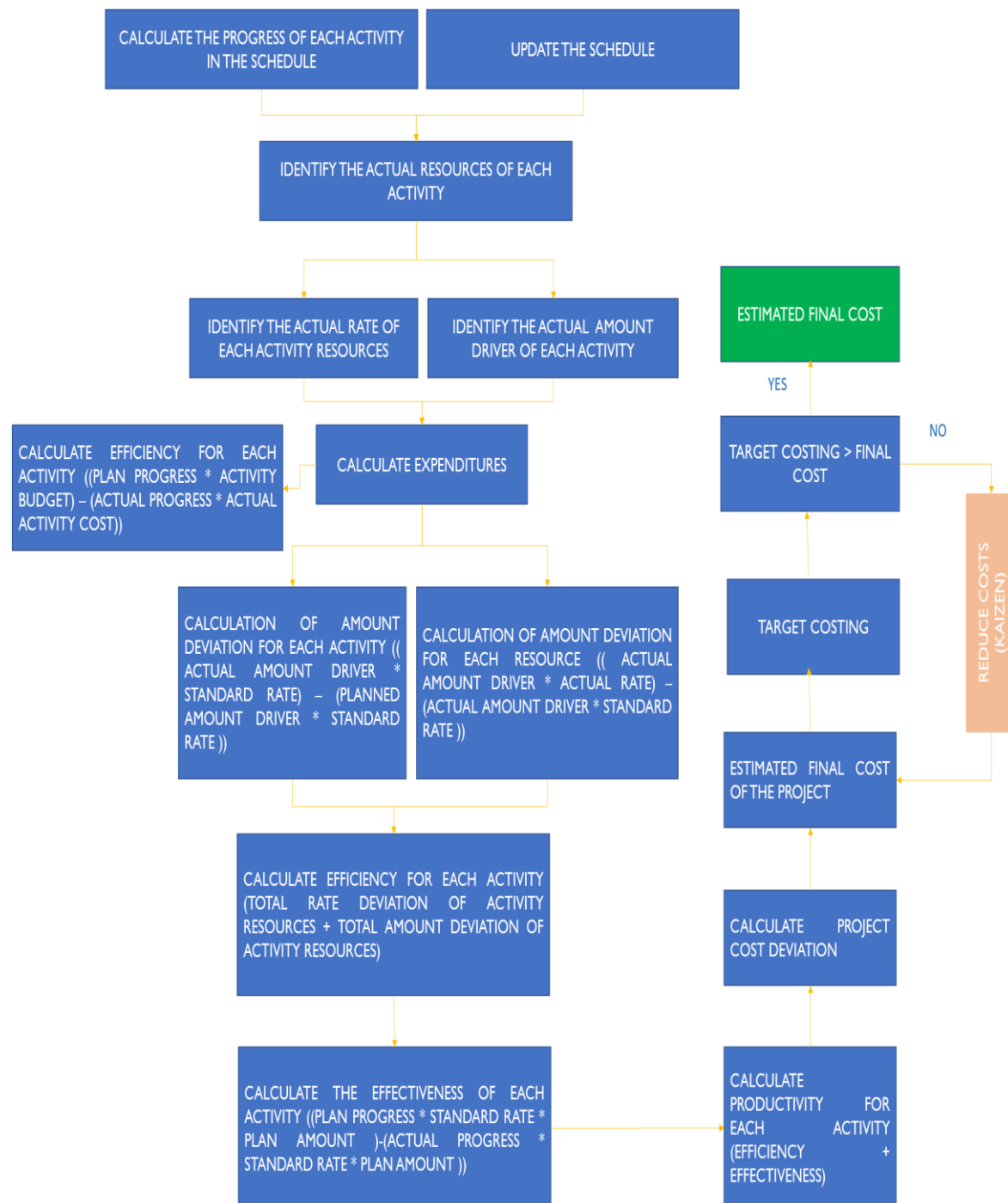
Table 5.8: Application of coefficient variable to the estimated cost for Reinforcement :

MATERIAL COST	COEFFICIENT VARIATION	MATERIAL COST (AFTER)	LABOUR COST	COEFFICIENT VARIATION	LABOUR COST (AFTER)	TOTAL COST PER MT
61600	0.2554	77332.64	8400	0.211	10172.4	87505.04
61600	0.2554	77332.64	8400	0.211	10172.4	87505.04
61600	0.2554	77332.64	8400	0.211	10172.4	87505.04

5.3 PROPOSED FRAMEWORK FOR PREPARING COST ESTIMATE DURING INITIAL STAGE :



5.4 PROPOSED FRAMEWORK FOR PREPARING COST ESTIMATE DURING EXECUTION STAGE :



5.5 CONCLUSION :

Coefficient variation can be added to each procurement packages in target costing itself in order to attain the estimated cost. This can be done for each and every factors that influence the construction cost and a framework can be followed with control points where there is an option to revise the change in specifications and drawings of the construction project based on the updates.

ANNEXURE 1

ACTUAL VS ESTIMATED COST											
S.no	Description	Actual Expenses				Estimated cost				Cost difference	Percentage difference
		Unit	Qty	Rate	Amount	Unit	Qty	Rate	Amount		
1	FOUNDATION										
	River Sand Filling	Cft	10961			Cft	10961				
	River Sand	Cft	11082.11	22.00	243806.42	Cft	11082.11	22.50	249347.48	-5541.05	-2%
2	Labour for Filling	Cft	10961.00	5.00	54805.00	Cft	10961.00	4.50	49324.50	5480.50	11%
	PCC 1:4:8	Cft	8988			Cft	8988				
	over 3/4" jelly	Cft	7639.80	35.00	267393.00	Cft	7639.80	32.00	244473.60	22919.40	9%
	OPC 43 grade cement	Bags	808.92	320.00	258854.40	Bags	808.92	310.00	250765.20	8089.20	3%
	River Sand	Cft	4943.40	22.00	108754.80	Cft	4943.40	22.50	111226.50	-2471.70	-2%
3	labour	Cft	8988.00	23.00	206724.00	Cft	8988.00	20.00	179760.00	26964.00	15%
	AntiTermite Spreading	Sft	27232			Sft	27232				
	AntiTermite Spreading	Sqft	27232.00	4.50	122544.00	Sqft	27232.00	3.50	95312.00	27232.00	29%
4	Side Shoring Work	Sft	11626			Sft	11626				
	Side Shoring Work	Sqft	11628.00	35.00	406980.00	Sqft	11628.00	35.00	406980.00	0.00	0%
5	Waterproofing Plastering CM 1:5 -12mm thick	Sft	23412			Sft	23412				
	OPC 43 grade cement	Bags	444.83	320.00	142344.96	Bags	444.83	310.00	137896.68	4448.28	3%
	River Sand	Cft	2809.44	22.00	61807.68	Cft	2809.44	22.50	63212.40	-1404.72	-2%
	Labour	Sqft	23412.00	35.00	819420.00	Sqft	23412.00	33.50	784302.00	35118.00	4%
6	RCC 1: 1.5 :3 - Raft	Cft	26602			Cft	26602				
	OPC 43 grade cement	Bags	5586.42	320.00	1787654.40	Bags	5586.42	310.00	1731790.20	55864.20	3%
	20 mm Jelly	Cft	22611.70	35.00	791409.50	Cft	22611.70	32.00	723574.40	67835.10	9%
	River Sand	Cft	14631.10	22.00	321884.20	Cft	14631.10	22.50	329199.75	7315.55	-2%
	labour	Cft	26602.00	34.00	904468.00	Cft	26602.00	33.50	891167.00	13301.00	1%
	Admixture etc	Cft	26602.00	30.00	798060.00	Cft	26602.00	30.00	798060.00	0.00	0%
	Total										
7	RCC 1: 1.5 :3 - Raft Beam	Qty	8769			Qty	8769				
	OPC 43 grade cement	Bags	1841.49	320.00	589276.80	Bags	1841.49	310.00	570861.90	10414.90	3%
	20 mm jelly	Cft	7453.65	35.00	260877.75	Cft	7453.65	32.00	238516.80	22360.95	9%
	River Sand	Cft	4822.95	22.00	106104.90	Cft	4822.95	22.50	108516.38	2411.48	-2%
	labour	Cft	8769.00	36.00	315684.00	Cft	8769.00	33.00	289377.00	26307.00	9%
	Admixture etc	Cft	8769.00	30.00	263070.00	Cft	8769.00	30.00	263070.00	0.00	0%
8	RCCC 1:1.5:3 RCC Wall Concrete	Cft	1095.82			Cft	1095.82				
	OPC 43 grade cement	Bags	230.12	320.00	73639.10	Bags	230.12	310.00	71337.88	2301.22	3%
	20 mm Jelly	Cft	986.24	35.00	34518.33	Cft	986.24	32.00	31559.62	2958.71	9%
	River Sand	Cft	602.70	22.00	13259.42	Cft	602.70	22.50	13560.77	-301.35	-2%
	labour	Cft	1095.82	36.00	39449.52	Cft	1095.82	35.00	38353.70	1095.82	3%
	Admixture etc.,	Cft	1095.82	30.00	32874.60	Cft	1095.82	30.00	32874.60	0.00	0%
9	Waterproofing Plastering CM 1:5 -12mm thick in beam	Sft	33516			Sft	33516				
	OPC 43 grade cement	Bags	636.80	320.00	203777.28	Bags	636.80	310.00	197409.24	6368.04	3%
10	River Sand	Cft	4021.92	22.00	88482.24	Cft	4021.92	20.00	80438.40	8043.84	10%
	Labour	Sqft	33516.00	35.00	1173060.00	Sqft	33516.00	35.00	1173060.00	0.00	0%
	Dust filling at raft beam level	Cft	34184.11			Cft	34184.11				
11	Quarry dust	Cft	34184.11	25.00	854602.75	Cft	34184.11	20.00	683682.20	170920.55	25%
	Labour for Filling & Consolidation	Cft	34184.11	6.00	205104.66	Cft	34184.11	6.00	205104.66	0.00	0%
	Total										
12	Grano Flooring 4" thick	Cft	6717			Cft	6717				
	OPC 43 grade cement	Bags	1410.57	320.00	451382.40	Bags	1410.57	310.00	437276.70	14105.70	3%
	River Sand	Cft	3694.35	22.00	81275.70	Cft	3694.35	22.50	83122.88	-1847.18	-2%
	12mm chips	Cft	6045.30	30.00	181359.00	Cft	6045.30	30.00	181359.00	0.00	0%
	Labour	Sqft	6717.00	24.00	161208.00	Sqft	6717.00	24.00	161208.00	0.00	0%
13	Brick work 4.5"	Sft	929.03			Sft	929.03				
	OPC 43 grade cement	Bags	23.22575	320	7432.24	Bags	23.22575	310	7199.98	232.26	3%
	River Sand	Cft	139.3545	22	3065.80	Cft	139.3545	22.5	3135.48	-69.68	-2%
	Bricks 4.5"	nos	3716.12	7.5	27870.90	nos	3716.12	5.5	20438.66	7432.24	36%
	labour	Sqft	929.03	23	21367.69	Sqft	929.03	23	21367.69	0.00	0%
14	Walls Plastering CM 1:5 -12mm thick	Sft	1858.17			Sft	1858.17				
	OPC 43 grade cement	Bags	35.31	320.00	11297.67	Bags	35.31	310.00	10944.62	353.05	3%
	River Sand	Cft	222.98	22.00	4905.57	Cft	222.98	22.50	5017.06	-111.49	-2%
	Labour	Sqft	1858.17	17.00	31588.89	Sqft	1858.17	17.00	31588.89	0.00	0%
15	Earth work Excavation Pump Room	Qty	11741			Qty	11741				
	Earth work Excavation	Cft	11741.00	12.50	146762.50	Cft	11741.00	12.50	146762.50	0.00	0%
	Total										
16	Shuttering Work	Sft	16072			Sft	16072				
	Shuttering Materials	Sqft	16072	26	417872.00	Sqft	16072	26	417872.00	0.00	0%
	Shuttering Labours	Sqft	16072	26	417872.00	Sqft	16072	18	289296.00	128576.00	44%
BASEMENT											
1	RCC 1:1.5:3 -column	Cft	2473			Cft	2473				
	OPC 43 grade cement	Bags	519.33	320.00	166185.60	Bags	519.33	310.00	160992.30	5193.30	3%
	20 mm Jelly	Cft	2225.70	35.00	77899.50	Cft	2225.70	33.00	73448.10	4451.40	6%
	River Sand	Cft	1360.15	22.00	29923.30	Cft	1360.15	22.50	30603.38	-680.08	-2%
	labour	Cft	2473.00	35.00	86555.00	Cft	2473.00	33.00	81609.00	4946.00	6%
	Admixture	Cft	2473.00	30.00	74190.00	Cft	2473.00	30.00	74190.00	0.00	0%
2	RCC 1:1.5:3 -PT Beam	Cft	4023			Cft	4023				
	OPC 43 grade cement	Bags	965.52	320.00	308966.40	Bags	965.52	310.00	299311.20	9655.20	3%
	20 mm Jelly	Cft	3620.70	35.00	126724.50	Cft	3620.70	33.00	119483.10	7241.40	6%
	River Sand	Cft	2212.65	22.00	48678.30	Cft	2212.65	22.50	49784.63	-1106.33	-2%
	labour	Cft	4023.00	42.00	168966.00	Cft	4023.00	38.00	152874.00	16092.00	11%
	Admixture etc.,	Cft	4023.00	30.00	120690.00	Cft	4023.00	30.00	120690.00	0.00	0%
3	RCC 1:1.5:3 - Roof Beam	Cft	2121.23			Cft	2121.23				
	OPC 43 grade cement	Bags	509.10	320.00	162910.46	Bags	509.10	310.00	157819.51	5090.95	3%
	20 mm Jelly	Cft	1909.11	35.00	66818.75	Cft	1909.11	33.00	63000.53	3818.21	6%
	River Sand	Cft	1166.68	22.00	25666.88	Cft	1166.68	22.50	26250.22	-583.34	-2%
	labour	Cft	2121.23	42.00	89091.66	Cft	2121.23	35.00	74243.05	14848.61	20%
	Admixture	Cft	2121.23	30.00	63636.90	Cft	2121.23	30.00	63636.90	0.00	0%

4	RCC 1:1.5:3 - Roof slab	Cft	9148.27			Cft	9148.27				
	OPC 43 grade cement	Bags	2195.58	320.00	702587.14	Bags	2195.58	310.00	680631.29	21953.83	3%
	20 mm jelly	Cft	8233.44	35.00	288170.51	Cft	8233.44	33.00	271703.62	16466.89	6%
	River Sand	Cft	5031.55	22.00	110694.07	Cft	5031.55	22.50	113209.84	-2315.77	-2%
	labour	Cft	9148.27	34.00	311041.18	Cft	9148.27	34.00	311041.18	0.00	0%
	Admixture etc.,	Cft	9148.27	30.00	274448.10	Cft	9148.27	30.00	274448.10	0.00	0%
5	RCC 1:1.5:3 - Staircase concrete	Cft	989.87			Cft	989.87				
	OPC 43 grade cement	Bags	207.87	320.00	66519.26	Bags	207.87	310.00	64440.54	2078.73	3%
	20 mm jelly	Cft	890.88	35.00	31180.91	Cft	890.88	33.00	29399.14	1781.77	6%
	River Sand	Cft	544.43	22.00	11977.43	Cft	544.43	22.50	12249.64	-272.21	-2%
	labour	Cft	989.87	25.00	24746.75	Cft	989.87	23.00	22767.01	1979.74	9%
	Admixture etc.,	Cft	989.87	30.00	29696.10	Cft	989.87	30.00	29696.10	0.00	0%
6	Brickwork 9" in C.M 1:5	Cft	1162			Cft	1162				
	OPC 43 grade cement	Bags	52.29	320.00	16732.80	Bags	52.29	310.00	16209.90	522.90	3%
	River Sand	Cft	406.70	22.00	8947.40	Cft	406.70	22.50	9150.75	-203.35	-2%
	Ordinary Brick	nos	15687.00	7.50	117652.50	nos	15687.00	7.50	117652.50	0.00	0%
	labour	Cft	1162.00	27.00	31374.00	Cft	1162.00	21.00	24402.00	8972.00	29%
7	Ceiling Plastering CM 1:4 -12mm thick	Sft	20707			Sft	20707				
	OPC 43 grade cement	Bags	414.14	320.00	132524.80	Bags	414.14	310.00	128383.40	4141.40	3%
	River Sand	Cft	2484.84	22.00	54666.48	Cft	2484.84	22.50	55908.90	-1242.42	-2%
	Labour Plastering and Hacking	Sqft	20707.00	20.00	414140.00	Sqft	20707.00	19.00	393433.00	20707.00	5%
8	Beam Plastering CM 1:4 -12mm thick	Sft	8556			Sft	8556				
	OPC 43 grade cement	Bags	171.12	320.00	54758.40	Bags	171.12	310.00	53047.20	1711.20	3%
	River Sand	Cft	1026.72	22.00	22587.84	Cft	1026.72	22.50	23101.20	-513.36	-2%
	Labour Plastering and Hacking	Sqft	8556.00	20.00	171120.00	Sqft	8556.00	17.50	149730.00	21390.00	14%
	Total										
9	Column Plastering CM 1:4 -12mm thick	Sft	4823			Sft	4823				
	OPC 43 grade cement	Bags	96.46	320.00	30867.20	Bags	96.46	310.00	29902.60	964.60	3%
	River Sand	Cft	578.76	22.00	12732.72	Cft	578.76	22.50	13022.10	-289.38	-2%
	Labour Plastering and Hacking	Sqft	4823.00	18.00	86814.00	Sqft	4823.00	18.00	86814.00	0.00	0%
10	walls Plastering CM 1:5 -12mm thick	Sft	5963			Sft	5963				
	OPC 43 grade cement	Bags	113.30	320.00	36255.04	Bags	113.30	310.00	35122.07	1132.97	3%
	River Sand	Cft	715.56	22.00	15742.32	Cft	715.56	22.50	16100.10	-357.78	-2%
	Labour	Sqft	5963.00	17.00	101371.00	Sqft	5963.00	17.00	101371.00	0.00	0%
11	R.C.C 1:1.5:3 RCC Wall Concrete	Cft	8633.74			Cft	8633.74				
	OPC 43 grade cement	Bags	1813.09	320.00	580187.33	Bags	1813.09	310.00	562056.47	18130.83	3%
	20 mm jelly	Cft	7770.37	35.00	271962.81	Cft	7770.37	33.00	256422.08	15540.73	6%
	River Sand	Cft	4748.56	22.00	104468.25	Cft	4748.56	22.00	104468.25	0.00	0%
	labour	Cft	8633.74	35.00	302180.90	Cft	8633.74	30.00	259012.20	43168.70	17%
	Admixture etc.,	Cft	8633.74	30.00	259012.20	Cft	8633.74	30.00	259012.20	0.00	0%
12	Waterproofing Plastering at RCC wall and projection slab	Qty	15599			Qty	15599				
	OPC 43 grade cement	Bags	296.38	320.00	94841.92	Bags	296.38	310.00	91878.11	2963.81	3%
	River Sand	Cft	1871.88	22.00	41181.36	Cft	1871.88	22.50	42117.30	-935.94	-2%
	Labour	Sqft	15599.00	35.00	545965.00	Sqft	15599.00	35.00	545965.00	0.00	0%
13	Basment Entry Ramp Concrete	Cft	1071.84			Cft	1071.84				
	OPC 43 grade cement	Bags	225.09	320.00	72027.65	Bags	225.09	310.00	69776.78	2250.86	3%
	20 mm jelly	Cft	964.66	35.00	33762.96	Cft	964.66	33.00	31833.65	1929.31	6%
	River Sand	Cft	589.51	22.00	12969.26	Cft	589.51	22.00	12969.26	0.00	0%
	labour	Cft	1071.84	35.00	37514.40	Cft	1071.84	30.00	32155.20	5359.20	17%
	Admixture etc.,	Cft	1071.84	30.00	32155.20	Cft	1071.84	30.00	32155.20	0.00	0%
14	Shuttering Work	Sft	59394			Sft	59394				
	Shuttering Materials	Sqft	59394	26	1544244.00	Sqft	59394	26	1544244.00	0.00	0%
	Shuttering Labours	Sqft	59394	26	1544244.00	Sqft	59394	18	1069092.00	475152.00	44%
	Total										
15	PT Beam Tendons & Other Materials	Cft	4023	165	663795.00	Cft	4023	165	663795.00	0.00	0%
	PT Slab Materials	Sft	1245.29	60	74717.40	Sft	1245.29	60	74717.40	0.00	0%
S.no	Description										
1	GROUND FLOOR										
	RCC 1:1.5:3 -column	Cft	2276.25			Cft	2276.25				
	OPC 43 grade cement	Bags	478.01	320.00	152964.00	Bags	478.01	310.00	148183.88	4780.13	3%
	20 mm jelly	Cft	2048.63	35.00	71701.88	Cft	2048.63	33.00	67604.63	4097.25	6%
	River Sand	Cft	1251.94	22.00	27542.63	Cft	1251.94	22.50	28168.59	-625.97	-2%
	labour	Cft	2276.25	35.00	79668.75	Cft	2276.25	30.00	68287.50	11381.25	17%
	Admixture etc.,	Cft	2276.25	30.00	68287.50	Cft	2276.25	30.00	68287.50	0.00	0%
2	RCC 1:1.5:3 -PT Beam	Cft	4023			Cft	4023				
	OPC 43 grade cement	Bags	965.52	320.00	308966.40	Bags	965.52	310.00	299311.20	9643.20	3%
	20 mm jelly	Cft	3620.70	35.00	126724.50	Cft	3620.70	33.00	119483.10	7244.40	6%
	River Sand	Cft	2212.65	22.00	48678.30	Cft	2212.65	22.00	48678.30	0.00	0%
	labour	Cft	4023.00	42.00	168966.00	Cft	4023.00	42.00	168966.00	0.00	0%
	Admixture etc.,	Cft	4023.00	30.00	120690.00	Cft	4023.00	30.00	120690.00	0.00	0%
3	RCC 1:1.5:3 - Roof Beam	Cft	1522.74			Cft	1522.74				
	OPC 43 grade cement	Bags	365.46	320.00	116946.43	Bags	365.46	310.00	113291.86	3654.58	3%
	20 mm jelly	Cft	1370.47	35.00	47966.31	Cft	1370.47	33.00	45225.38	2740.93	6%
	River Sand	Cft	837.51	22.00	18425.15	Cft	837.51	22.50	18843.91	-418.75	-2%
	labour	Cft	1522.74	42.00	63955.08	Cft	1522.74	28.00	42636.72	21318.36	80%
	Admixture etc.,	Cft	1522.74	30.00	45682.20	Cft	1522.74	30.00	45682.20	0.00	0%
4	RCC 1:1.5:3 - Roof slab	Cft	9398			Cft	9398				
	OPC 43 grade cement	Bags	2255.52	320.00	721766.40	Bags	2255.52	310.00	699211.20	22553.20	3%
	20 mm jelly	Cft	8458.20	35.00	296037.00	Cft	8458.20	33.00	279120.60	16916.40	6%
	River Sand	Cft	5168.90	22.00	113715.80	Cft	5168.90	22.50	116300.25	-2584.45	-2%
	labour	Cft	9398.00	34.00	319532.00	Cft	9398.00	33.00	310134.00	9408.00	3%
	Admixture etc.,	Cft	9398.00	30.00	281940.00	Cft	9398.00	30.00	281940.00	0.00	0%
5	RCC 1:1.5:3 - Staircase concrete	Cft	989.87			Cft	989.87				
	OPC 43 grade cement	Bags	207.87	320.00	66519.26	Bags	207.87	310.00	64440.54	2078.73	3%
	20 mm jelly	Cft	890.88	35.00	31180.91	Cft	890.88	33.00	29399.14	1781.77	6%
	River Sand	Cft	544.43	22.00	11977.43	Cft	544.43	22.50	12249.64	-272.21	-2%

	labour	Cft	989.87	25.00	24746.75	Cft	989.87	25.00	24746.75	0.00	0%
	Admixture etc.,	Cft	989.87	30.00	29696.10	Cft	989.87	30.00	29696.10	0.00	0%
6	Brickwork 9" in C.M 1:5	Cft	5595			Cft	5595				
	OPC 43 grade cement	Bags	251.78	320.00	80568.00	Bags	251.78	305.00	76791.38	3776.63	5%
	River Sand	Cft	1958.25	22.00	43081.50	Cft	1958.25	22.50	44060.63	-979.13	-2%
	Ordinary Brick	nos	75532.50	7.50	566493.75	nos	75532.50	7.50	566493.75	0.00	0%
	labour	Cft	5595.00	28.00	156660.00	Cft	5595.00	28.00	156660.00	0.00	0%
7	Ceiling Plastering CM 1:4 -12mm thick	Sft	14502.63			Sft	14502.63				
	OPC 43 grade cement	Bags	290.05	320.00	92816.83	Bags	290.05	305.00	88466.04	4350.79	5%
	River Sand	Cft	1740.32	22.00	38286.94	Cft	1740.32	22.50	39157.10	-970.16	-2%
	Labour Plastering and Hacking	Sqft	14502.63	21.00	304555.23	Sqft	14502.63	21.00	304555.23	0.00	0%
8	Beam Plastering CM 1:4 -12mm thick	Sft	8555.5			Sft	8555.5				
	OPC 43 grade cement	Bags	171.11	320.00	54755.20	Bags	171.11	305.00	52188.55	2566.65	5%
	River Sand	Cft	1026.66	22.00	22586.52	Cft	1026.66	22.50	23099.85	-513.33	-2%
	Labour Plastering and Hacking	Sqft	8555.50	21.00	179665.50	Sqft	8555.50	21.00	179665.50	0.00	0%
9	Column Plastering CM 1:4 -12mm thick	Sft	5160			Sft	5160				
	OPC 43 grade cement	Bags	103.20	320.00	33024.00	Bags	103.20	305.00	31476.00	1548.00	5%
	River Sand	Cft	619.20	22.00	13622.40	Cft	619.20	22.00	13622.40	0.00	0%
	Labour Plastering and Hacking	Sqft	5160.00	19.00	98040.00	Sqft	5160.00	19.00	98040.00	0.00	0%
	Total										
10	Walls Plastering CM 1:5 -12mm thick	Sft	14703			Sft	14703				
	OPC 43 grade cement	Bags	279.36	320.00	89394.24	Bags	279.36	305.00	85203.89	4190.36	5%
	River Sand	Cft	1764.36	22.00	38815.92	Cft	1764.36	22.00	38815.92	0.00	0%
	Labour	Sqft	14703.00	18.00	264654.00	Sqft	14703.00	18.00	264654.00	0.00	0%
11	Brick work 4.5"	Sft	2458.39			Sft	2458.39				
	OPC 43 grade cement	Bags	61.45975	320	19667.12	Bags	61.45975	305	18745.22	921.90	5%
	River Sand	Cft	368.7585	22	8112.69	Cft	368.7585	22	8112.69	0.00	0%
	Bricks 4.5"	nos	9833.56	7.5	73751.70	nos	9833.56	7.5	73751.70	0.00	0%
	labour	Sqft	2458.39	23	56542.97	Sqft	2458.39	23	56542.97	0.00	0%
12	R.C.C wall 4' feet Height	Cft	714.51			Cft	714.51				
	OPC 43 grade cement	Bags	150.05	320.00	48015.07	Bags	150.05	310.00	46514.60	1500.47	3%
	20 mm jelly	Cft	643.06	35.00	22507.07	Cft	643.06	32.00	20577.89	1929.18	9%
	River Sand	Cft	392.98	22.00	8645.57	Cft	392.98	25.00	9824.51	-1178.94	-12%
	labour	Cft	714.51	30.00	21435.30	Cft	714.51	30.00	21435.30	0.00	0%
	Admixture etc.,	Cft	714.51	30.00	21435.30	Cft	714.51	30.00	21435.30	0.00	0%
13	Ramp area Roof Concrete	Cft	418.10			Cft	418.10				
	OPC 43 grade cement	Bags	100.34	320.00	32110.08	Bags	100.34	310.00	31106.64	1003.44	3%
	20 mm jelly	Cft	376.29	35.00	13170.15	Cft	376.29	33.00	12417.57	752.58	6%
	River Sand	Cft	229.96	22.00	5059.01	Cft	229.96	25.00	5748.88	-689.87	-12%
	labour	Cft	418.10	23.00	9616.30	Cft	418.10	23.00	9616.30	0.00	0%
	Admixture etc.,	Cft	418.10	30.00	12543.00	Cft	418.10	30.00	12543.00	0.00	0%
14	Shuttering Work	Sft	36098.67			Sft	36098.67				
	Shuttering Materials	Sqft	36098.67	26	938565.42	Sqft	36098.67	26	938565.42	0.00	0%
	Shuttering Labours	Sqft	36098.67	26	938565.42	Sqft	36098.67	18	649776.06	288789.36	44%
15	PT Beam Tendons & Other Materials	Cft	4023	165	663795.00	Cft	4023	165	663795.00	0.00	0%
	PT Slab Tendons and other	Sft	1245.29	60	74717.40	Sft	1245.29	60	74717.40	0.00	0%
S.no	Description										
1	FIRST FLOOR										
1	RCC 1:1.5:3 -column	Cft	2596.33			Cft	2596.33				
	OPC 43 grade cement	Bags	545.23	320.00	174473.38	Bags	545.23	310.00	169021.08	5452.29	3%
	20 mm jelly	Cft	2336.70	35.00	81784.40	Cft	2336.70	33.00	77111.00	4673.39	6%
	River Sand	Cft	1427.98	22.00	31415.59	Cft	1427.98	25.00	35699.54	-4283.94	-12%
	labour	Cft	2596.33	37.00	96064.21	Cft	2596.33	35.00	90871.55	5192.66	6%
	Admixture etc.,	Cft	2596.33	30.00	77889.90	Cft	2596.33	30.00	77889.90	0.00	0%
2	RCC 1:1.5:3 -PT Beam	Cft	4747			Cft	4747				
	OPC 43 grade cement	Bags	1139.28	320.00	364569.60	Bags	1139.28	310.00	353176.80	11392.80	3%
	20 mm jelly	Cft	4272.30	35.00	149530.50	Cft	4272.30	33.00	140985.90	8544.60	6%
	River Sand	Cft	2610.85	22.00	57438.70	Cft	2610.85	25.00	65271.25	-7812.55	-12%
	labour	Cft	4747.00	44.00	208868.00	Cft	4747.00	40.00	189880.00	18988.00	10%
	Admixture etc.,	Cft	4747.00	30.00	142410.00	Cft	4747.00	30.00	142410.00	0.00	0%
3	RCC 1:1.5:3 - Roof Beam	Cft	1522.74			Cft	1522.74				
	OPC 43 grade cement	Bags	365.46	320.00	116946.43	Bags	365.46	310.00	113291.86	3654.58	3%
	20 mm jelly	Cft	1370.47	35.00	47966.31	Cft	1370.47	33.00	45225.38	2740.93	6%
	River Sand	Cft	837.51	22.00	18425.15	Cft	837.51	25.00	20937.68	-2512.52	-12%
	labour	Cft	1522.74	44.00	67000.56	Cft	1522.74	35.00	53295.90	13704.66	26%
	Admixture etc.,	Cft	1522.74	30.00	45682.20	Cft	1522.74	30.00	45682.20	0.00	0%
4	RCC 1:1.5:3 - Roof slab	Cft	9398.42			Cft	9398.42				
	OPC 43 grade cement	Bags	2255.62	320.00	721798.66	Bags	2255.62	310.00	699242.45	22556.21	3%
	20 mm jelly	Cft	8458.58	35.00	296050.23	Cft	8458.58	33.00	279133.07	16917.16	6%
	River Sand	Cft	5169.13	22.00	113720.88	Cft	5169.13	25.00	129228.28	-15587.39	-12%
	labour	Cft	9398.42	36.00	338343.12	Cft	9398.42	28.00	263155.76	75187.36	29%
	Admixture etc	Cft	9398.42	30.00	281952.60	Cft	9398.42	30.00	281952.60	0.00	0%
5	RCC 1:1.5:3 - Staircase concrete	Cft	989.87			Cft	989.87				
	OPC 43 grade cement	Bags	207.87	320.00	66519.26	Bags	207.87	310.00	64440.54	2078.71	3%
	20 mm jelly	Cft	890.88	35.00	31180.91	Cft	890.88	33.00	29399.14	1781.77	6%
	River Sand	Cft	544.43	22.00	11977.43	Cft	544.43	25.00	13610.71	-1633.28	-12%
	labour	Cft	989.87	27.00	26726.49	Cft	989.87	27.00	26726.49	0.00	0%
	Admixture etc.,	Cft	989.87	30.00	29696.10	Cft	989.87	30.00	29696.10	0.00	0%
6	Brickwork 9" in C.M 1:5	Cft	5002			Cft	5002				
	OPC 43 grade cement	Bags	225.09	320.00	72028.80	Bags	225.09	305.00	68652.45	3376.35	5%
	River Sand	Cft	1750.70	22.00	38515.40	Cft	1750.70	25.00	43767.50	-5252.10	-12%
	Ordinary Brick	nos	67527.00	7.50	506452.50	nos	67527.00	7.50	506452.50	0.00	0%
	labour	Cft	5002.00	28.00	140056.00	Cft	5002.00	25.00	125050.00	15006.00	12%
7	Ceiling Plastering CM 1:4 -12mm thick	Sft	14835.56			Sft	14835.56				
	OPC 43 grade cement	Bags	296.71	320.00	94947.58	Bags	296.71	305.00	90496.92	4450.67	5%
	River Sand	Cft	1780.27	22.00	39165.88	Cft	1780.27	25.00	44506.68	-5340.80	-12%

	Labour Plastering and Hacking	Sqft	14835.56	22.00	326382.32	Sqft	14835.56	20.00	296711.20	296711.20	10%
8	Beam Plastering CM 1:4 -12mm thick	Sft	8115.98			Sft	8115.98				
	OPC 43 grade cement	Bags	162.32	320.00	51942.27	Bags	162.32	305.00	49507.48	2433.79	5%
	River Sand	Cft	973.92	22.00	21426.19	Cft	973.92	25.00	24347.94	2921.75	-12%
	Labour Plastering and Hacking	Sqft	8115.98	22.00	178551.56	Sqft	8115.98	18.00	146087.64	32463.92	22%
9	Column Plastering CM 1:4 -12mm thick	Sft	5160			Sft	5160				
	OPC 43 grade cement	Bags	103.20	320.00	33024.00	Bags	103.20	305.00	31476.00	1548.00	5%
	River Sand	Cft	619.20	22.00	13622.40	Cft	619.20	25.00	15480.00	1857.60	-12%
	Labour Plastering and Hacking	Sqft	5160.00	20.00	103200.00	Sqft	5160.00	18.00	92880.00	10320.00	11%
10	walls Plastering CM 1:5 -12mm thick	Sft	19101.5			Sft	19101.5				
	OPC 43 grade cement	Bags	362.93	320.00	116137.12	Bags	362.93	305.00	110693.19	5443.93	5%
	River Sand	Cft	2292.18	22.00	50427.96	Cft	2292.18	25.00	57304.50	6876.54	-12%
	Labour	Sqft	19101.50	19.00	362928.50	Sqft	19101.50	19.00	362928.50	0.00	0%
11	Brick work 4.5"	Sft	6812.19			Sft	6812.19				
	OPC 43 grade cement	Bags	170.30475	320	54497.52	Bags	170.30475	305	51942.95	2554.57	5%
	River Sand	Cft	1021.8285	22	22480.23	Cft	1021.8285	25	25545.71	3063.49	-12%
	Bricks 4.5"	nos	27248.76	7.5	204365.70	nos	27248.76	7.5	204365.70	0.00	0%
	labour	Sqft	6812.19	23	156680.37	Sqft	6812.19	19	129431.61	27248.76	21%
12	R.C.C wall at 4'feet Height	Cft	519.66			Cft	519.66				
	OPC 43 grade cement	Bags	109.13	320.00	34921.15	Bags	109.13	310.00	33829.87	1091.29	3%
	20 mm jelly	Cft	467.69	35.00	16369.29	Cft	467.69	33.00	15433.90	935.39	6%
	River Sand	Cft	285.81	22.00	6287.89	Cft	285.81	25.00	7145.33	857.44	-12%
	labour	Cft	519.66	30.00	15589.80	Cft	519.66	28.00	14550.48	1039.32	7%
	Admixture etc.,	Cft	519.66	30.00	15589.80	Cft	519.66	30.00	15589.80	0.00	0%
13	Shuttering Work	Qty	34537.65			Qty	34537.65				
	Shuttering Materials	Sqft	34537.65	26	897978.90	Sqft	34537.65	26	897978.90	0.00	0%
	Shuttering Labours	Sqft	34537.65	26	897978.90	Sqft	34537.65	18	621677.70	276301.20	44%
14	PT Beam Tendons & other Materials	Cft	4747	165	783255.00	Cft	4747	165	783255.00	0.00	0%
	PT slab Tendons	Sft	1245.29	60	74717.40	Sft	1245.29	60	74717.40	0.00	0%
										0.00	
										0.00	
S.no	Description									0.00	
	SECOND FLOOR									0.00	
1	RCC 1:1.5:3 -column	Cft	2620.35			Cft	2620.35			0.00	
	OPC 43 grade cement	Bags	550.27	320.00	176087.52	Bags	550.27	310.00	170584.79	5502.73	3%
	20 mm jelly	Cft	2358.32	35.00	82541.03	Cft	2358.32	33.00	77824.40	4716.63	6%
	River Sand	Cft	1441.19	22.00	31706.24	Cft	1441.19	25.00	36079.81	4371.58	-12%
	labour	Cft	2620.35	39.00	102193.65	Cft	2620.35	36.00	94332.60	7861.05	8%
	Admixture	Cft	2620.35	30.00	78610.50	Cft	2620.35	30.00	78610.50	0.00	0%
2	RCC 1:1.5:3 -PT Beam	Cft	4519.25			Cft	4519.25				
	OPC 43 grade cement	Bags	1084.62	320.00	347078.40	Bags	1084.62	310.00	336232.20	10846.20	3%
	20 mm jelly	Cft	4067.33	35.00	142356.38	Cft	4067.33	33.00	134221.73	8134.65	6%
	River Sand	Cft	2485.59	22.00	54682.93	Cft	2485.59	25.00	62139.69	7456.76	-12%
	labour	Cft	4519.25	46.00	207885.50	Cft	4519.25	45.00	203366.25	4519.25	2%
	Admixture etc.,	Cft	4519.25	30.00	135577.50	Cft	4519.25	30.00	135577.50	0.00	0%
3	RCC 1:1.5:3 - Roof Beam	Cft	2519.53			Cft	2519.53				
	OPC 43 grade cement	Bags	604.69	320.00	193499.90	Bags	604.69	310.00	187453.03	6046.97	3%
	20 mm jelly	Cft	2267.58	35.00	79365.20	Cft	2267.58	33.00	74830.04	4515.15	6%
	River Sand	Cft	1385.74	22.00	30486.31	Cft	1385.74	25.00	34643.54	4157.22	-12%
	labour	Cft	2519.53	46.00	115898.38	Cft	2519.53	46.00	115898.38	0.00	0%
	Admixture etc.,	Cft	2519.53	30.00	75585.90	Cft	2519.53	30.00	75585.90	0.00	0%
4	RCC 1:1.5:3 -Roof slab	Cft	5598.04			Cft	5598.04				
	OPC 43 grade cement	Bags	1343.53	320.00	429929.47	Bags	1343.53	310.00	416494.18	13435.30	3%
	20 mm jelly	Cft	5038.24	35.00	176338.26	Cft	5038.24	33.00	166261.79	10676.47	6%
	River Sand	Cft	3078.92	22.00	67736.28	Cft	3078.92	25.00	76973.05	9236.72	-12%
	labour	Cft	5598.04	38.00	212725.52	Cft	5598.04	38.00	212725.52	0.00	0%
	Admixture etc.,	Cft	5598.04	30.00	167941.20	Cft	5598.04	30.00	167941.20	0.00	0%
5	RCC 1:1.5:3 -Staircase concrete	Cft	989.87			Cft	989.87				
	OPC 43 grade cement	Bags	207.87	320.00	66519.26	Bags	207.87	310.00	64440.54	2078.71	3%
	20 mm jelly	Cft	890.88	35.00	31180.91	Cft	890.88	33.00	29399.14	1781.77	6%
	River Sand	Cft	544.43	22.00	11977.43	Cft	544.43	25.00	13610.71	1633.29	-12%
	labour	Cft	989.87	28.00	27716.36	Cft	989.87	28.00	27716.36	0.00	0%
	Admixture etc.,	Cft	989.87	30.00	29696.10	Cft	989.87	30.00	29696.10	0.00	0%
6	Brickwork 9" in C.M 1:5	Cft	4398.09			Cft	4398.09				
	OPC 43 grade cement	Bags	197.91	320.00	63332.50	Bags	197.91	305.00	60363.79	2968.71	5%
	River Sand	Cft	1539.33	22.00	33865.29	Cft	1539.33	25.00	38483.29	4617.99	-12%
	Ordinary Brick	nos	59374.22	7.50	445306.61	nos	59374.22	5.50	326558.18	118748.43	36%
	labour	Cft	4398.09	30.00	131942.70	Cft	4398.09	30.00	131942.70	0.00	0%
7	Celling Plastering CM 1:4 -12mm thick	Sft	14068.85			Sft	14068.85				
	OPC 43 grade cement	Bags	281.38	320.00	90040.64	Bags	281.38	305.00	85819.99	4220.65	5%
	River Sand	Cft	1688.26	22.00	37141.76	Cft	1688.26	25.00	42206.55	3064.79	-12%
	Labour Plastering and Hacking	Sqft	14068.85	25.00	351721.25	Sqft	14068.85	22.00	309514.70	42206.55	14%
8	Beam Plastering CM 1:4 -12mm thick	Sft	5808.74			Sft	5808.74				
	OPC 43 grade cement	Bags	116.17	320.00	37175.94	Bags	116.17	305.00	35433.31	1742.63	5%
	River Sand	Cft	697.05	22.00	15335.07	Cft	697.05	25.00	17426.22	2091.15	-12%
	Labour Plastering and Hacking	Sqft	5808.74	25.00	145218.50	Sqft	5808.74	23.00	133601.02	11617.48	9%
9	Column Plastering CM 1:4 -12mm thick	Sft	5160			Sft	5160				
	OPC 43 grade cement	Bags	103.20	320.00	33024.00	Bags	103.20	305.00	31476.00	1548.00	5%
	River Sand	Cft	619.20	22.00	13622.40	Cft	619.20	25.00	15480.00	1857.60	-12%
	Labour Plastering and Hacking	Sqft	5160.00	23.00	118680.00	Sqft	5160.00	23.00	118680.00	0.00	0%
10	Walls Plastering CM 1:5 -12mm thick	Sft	17192.21			Sft	17192.21				
	OPC 43 grade cement	Bags	326.65	320.00	104528.64	Bags	326.65	305.00	99628.86	4899.78	5%
	River Sand	Cft	2063.07	22.00	45387.43	Cft	2063.07	25.00	51576.63	6189.20	-12%
	Labour	Sqft	17192.21	19.00	326651.99	Sqft	17192.21	19.00	326651.99	0.00	0%
11	Brick work 4.5"	Sft	988.13			Sft	988.13				
	OPC 43 grade cement	Bags	24.70325	320	7905.04	Bags	24.70325	305	7534.49	370.55	5%
	River Sand	Cft	148.2195	22	3260.83	Cft	148.2195	25	3705.49	444.66	-12%

	Bricks 4.5"	nos	3952.52	7.5	29643.90	nos	3952.52	6.5	25691.38	3951.53	15%
	labour	Sqft	988.13	25	24703.25	Sqft	988.13	25	24703.25	0.00	0%
12	Shuttering Work	Qty	35147.2			Qty	35147.2				
	Shuttering Materials	Sq.ft	35147.2	26	913827.20	Sq.ft	35147.2	26	913827.20	0.00	0%
	Shuttering Labours	Sq.ft	35147.2	26	913827.20	Sq.ft	35147.2	19	667796.80	246038.40	37%
	Total										
13	PT Beam Tendons Materials	Cft	4519.25	165	745676.25	Cft	4519.25	165	745676.25	0.00	0%
	PT Slab Tendons & other	Sft	1245.29	60	74717.40	Sft	1245.29	60	74717.40	0.00	0%
S.no	Description										
	THIRD FLOOR										
1	RCC 1:1.5:3 -column	Cft	2317.5			Cft	2317.5				
	OPC 43 grade cement	Bags	486.68	320.00	155736.00	Bags	486.68	310.00	150869.25	4866.75	3%
	20 mm jelly	Cft	2085.75	35.00	73001.25	Cft	2085.75	33.00	68829.75	4571.50	6%
	River Sand	Cft	1274.63	22.00	28041.75	Cft	1274.63	24.00	30591.00	2549.25	-8%
	labour	Cft	2317.50	41.00	95017.50	Cft	2317.50	35.00	81112.50	13905.00	17%
	Admixture etc.,	Cft	2317.50	30.00	69525.00	Cft	2317.50	30.00	69525.00	0.00	0%
2	RCC 1:1.5:3 -PT Beam	Cft	4519.25			Cft	4519.25				
	OPC 43 grade cement	Bags	1084.62	320.00	347078.40	Bags	1084.62	310.00	336232.20	10846.20	3%
	20 mm jelly	Cft	4067.33	35.00	142356.38	Cft	4067.33	33.00	134221.73	8134.65	6%
	River Sand	Cft	2485.59	22.00	54682.93	Cft	2485.59	24.00	59654.10	4971.18	-8%
	labour	Cft	4519.25	48.00	216924.00	Cft	4519.25	48.00	216924.00	0.00	0%
	Admixture etc.,	Cft	4519.25	30.00	135577.50	Cft	4519.25	30.00	135577.50	0.00	0%
3	RCC 1:1.5:3 - Roof Beam	Cft	1214.64			Cft	1214.64				
	OPC 43 grade cement	Bags	291.51	320.00	93284.35	Bags	291.51	310.00	90369.22	2915.14	3%
	20 mm jelly	Cft	1093.18	35.00	38261.16	Cft	1093.18	33.00	36074.81	2386.35	6%
	River Sand	Cft	668.05	22.00	14697.14	Cft	668.05	24.00	16033.25	1236.10	-8%
	labour with admixture	Cft	1214.64	48.00	58302.72	Cft	1214.64	48.00	58302.72	0.00	0%
	Admixture etc.,	Cft	1214.64	30.00	36439.20	Cft	1214.64	30.00	36439.20	0.00	0%
4	RCC 1:1.5:3 - Roof slab	Cft	9398.42			Cft	9398.42				
	OPC 43 grade cement	Bags	2255.62	320.00	721798.66	Bags	2255.62	310.00	699242.45	22556.21	3%
	20 mm jelly	Cft	8458.58	35.00	296050.23	Cft	8458.58	33.00	279133.07	16912.16	6%
	River Sand	Cft	5169.13	22.00	113720.88	Cft	5169.13	24.00	124059.14	10338.26	-8%
	labour	Cft	9398.42	40.00	375936.80	Cft	9398.42	40.00	375936.80	0.00	0%
	Admixture etc.,	Cft	9398.42	30.00	281952.60	Cft	9398.42	30.00	281952.60	0.00	0%
5	RCC 1:1.5:3 - Staircase concrete	Cft	989.87			Cft	989.87				
	OPC 43 grade cement	Bags	207.87	320.00	66519.26	Bags	207.87	310.00	64440.54	2078.73	3%
	20 mm jelly	Cft	890.88	35.00	31180.91	Cft	890.88	33.00	29399.14	1781.77	6%
	River Sand	Cft	544.43	22.00	11977.43	Cft	544.43	24.00	13066.28	1088.86	-8%
	labour	Cft	989.87	31.00	30685.97	Cft	989.87	31.00	30685.97	0.00	0%
	Admixture etc.,	Cft	989.87	30.00	29696.10	Cft	989.87	30.00	29696.10	0.00	0%
6	Brickwork 9" in C.M 1:5	Cft	5243.2			Cft	5243.2				
	OPC 43 grade cement	Bags	235.94	320.00	75502.08	Bags	235.94	305.00	71962.92	3528.14	5%
	River Sand	Cft	1835.12	35.00	64229.20	Cft	1835.12	25.00	45878.00	18351.20	40%
	Ordinary Brick	nos	70783.20	7.50	530874.00	nos	70783.20	7.50	530874.00	0.00	0%
	labour	Cft	5243.20	32.00	167782.40	Cft	5243.20	28.00	146809.60	20972.80	14%
7	Ceiling Plastering CM 1:4 -12mm thick	Sft	13151			Sft	13151				
	OPC 43 grade cement	Bags	263.02	320.00	84166.40	Bags	263.02	305.00	80221.10	3945.30	5%
	River Sand	Cft	1578.12	22.00	34718.64	Cft	1578.12	25.00	39453.00	4734.36	-12%
	Labour Plastering and Hacking	Sqft	13151.00	27.00	355077.00	Sqft	13151.00	25.00	328775.00	26302.00	8%
	Total										
8	Beam Plastering CM 1:4 -12mm thick	Sft	5808.74			Sft	5808.74				
	OPC 43 grade cement	Bags	116.17	320.00	37175.94	Bags	116.17	305.00	35433.31	1742.62	5%
	River Sand	Cft	697.05	22.00	15335.07	Cft	697.05	25.00	17426.22	2091.15	-12%
	Labour Plastering and Hacking	Sqft	5808.74	27.00	156835.98	Sqft	5808.74	26.00	151027.24	5808.74	4%
9	Column Plastering CM 1:4 -12mm thick	Sft	2222.63			Sft	2222.63				
	OPC 43 grade cement	Bags	44.45	320.00	14224.83	Bags	44.45	305.00	13558.04	666.79	5%
	River Sand	Cft	266.72	22.00	5867.74	Cft	266.72	25.00	6667.89	608.15	-12%
	Labour Plastering and Hacking	Sqft	2222.63	25.00	55565.75	Sqft	2222.63	25.00	55565.75	0.00	0%
10	Walls Plastering CM 1:5 -12mm thick	Sft	41003			Sft	41003				
	OPC 43 grade cement	Bags	779.06	320.00	249298.24	Bags	779.06	305.00	237612.39	11685.85	5%
	River Sand	Cft	4920.36	22.00	108247.92	Cft	4920.36	25.00	123009.00	14761.08	-12%
	Labour	Sqft	41003.00	20.00	820060.00	Sqft	41003.00	22.00	902066.00	82006.00	-9%
11	Brick work 4.5"	Sft	12182			Sft	12182				
	OPC 43 grade cement	Bags	304.55	320	97456.00	Bags	304.55	305	92887.75	4568.25	5%
	River Sand	Cft	1827.3	22	40200.60	Cft	1827.3	25	45682.50	2461.50	-12%
	Bricks 4.5"	nos	48728	7.5	365460.00	nos	48728	5.5	268004.00	97456.00	36%
	labour	Sqft	12182	27	328914.00	Sqft	12182	25	304550.00	24364.00	8%
12	Shuttering Work	Sft	33428.21			Sft	33428.21				
	Shuttering Materials	Sqft	33428.21	26	869133.46	Sqft	33428.21	26	869133.46	0.00	0%
	Shuttering Labours	Sqft	33428.21	26	869133.46	Sqft	33428.21	18	601707.78	267425.68	44%
13	PT Beam Tendons & Other Materials	Qty	4519.25	165	745676.25	Qty	4519.25	165	745676.25	0.00	0%
	PT Slab Other Materials	Qty	1245.29	60	74717.40	Qty	1245.29	60	74717.40	0.00	0%
S.no	Description										
	TERRACE FLOOR										
1	RCC 1:1.5:3 -column	Cft	558.33			Cft	558.33				
	OPC 43 grade cement	Bags	117.25	320.00	37519.78	Bags	117.25	315.00	36933.53	586.25	2%
	20 mm jelly	Cft	502.50	35.00	17587.40	Cft	502.50	33.00	16582.40	1064.99	6%
	River Sand	Cft	307.08	22.00	6755.79	Cft	307.08	25.00	7677.04	921.24	-12%
	labour	Cft	558.33	41.00	22891.53	Cft	558.33	35.00	19541.55	3349.98	17%
	Admixture	Cft	558.33	30.00	16749.90	Cft	558.33	30.00	16749.90	0.00	0%
2	RCC 1:1.5:3 - Roof Beam	Cft	276.87			Cft	276.87				
	OPC 43 grade cement	Bags	66.45	320.00	21263.62	Bags	66.45	315.00	20931.37	332.24	2%
	20 mm jelly	Cft	249.18	35.00	8721.41	Cft	249.18	33.00	8223.04	598.37	6%
	River Sand	Cft	152.28	22.00	3350.13	Cft	152.28	25.00	3806.96	456.84	-12%
	labour	Cft	276.87	41.00	11351.67	Cft	276.87	41.00	11351.67	0.00	0%
	Admixture	Cft	276.87	30.00	8306.10	Cft	276.87	30.00	8306.10	0.00	0%

3	RCC 1:1.5:3 - Roof slab	Cft	1171.75			Cft	1171.75					
	OPC 43 grade cement	Bags	281.22	320.00	89990.40	Bags	281.22	315.00	88584.30	1406.10	2%	
	20 mm jelly	Cft	1054.58	35.00	36910.13	Cft	1054.58	33.00	34800.98	2109.15	6%	
	River Sand	Cft	644.46	22.00	14178.18	Cft	644.46	25.00	16111.56	-1933.39	-12%	
	labour	Cft	1171.75	33.00	38667.75	Cft	1171.75	33.00	38667.75	0.00	0%	
	Admixture etc.,	Cft	1171.75	30.00	35152.50	Cft	1171.75	30.00	35152.50	0.00	0%	
4	RCC 1:1.5:3 - Staircase concrete	Cft	989.87			Cft	989.87					
	OPC 43 grade cement	Bags	207.87	320.00	66519.26	Bags	207.87	315.00	65479.90	1039.36	2%	
	20 mm jelly	Cft	890.88	35.00	31180.91	Cft	890.88	33.00	29399.14	1781.77	6%	
	River Sand	Cft	544.43	22.00	11977.43	Cft	544.43	25.00	13610.71	-1633.29	-12%	
	labour	Cft	989.87	33.00	32665.71	Cft	989.87	33.00	32665.71	0.00	0%	
	Admixture etc.,	Cft	989.87	30.00	29696.10	Cft	989.87	30.00	29696.10	0.00	0%	
5	Brickwork 9" in C.M 1:5	Cft	4370.2			Cft	4370.2					
	OPC 43 grade cement	Bags	196.66	320.00	62930.88	Bags	196.66	310.00	60964.29	1966.59	3%	
	River Sand	Cft	1529.57	22.00	33650.54	Cft	1529.57	25.00	38239.25	-4508.71	-12%	
	Ordinary Brick	nos	58997.70	7.50	442482.75	nos	58997.70	6.50	383485.05	58997.20	15%	
	labour	Cft	4370.20	34.00	148586.80	Cft	4370.20	34.00	148586.80	0.00	0%	
6	Ceiling Plastering CM 1:4 -12mm thick	Sft	1620.7			Sft	1620.7					
	OPC 43 grade cement	Bags	32.41	320.00	10372.48	Bags	32.41	310.00	10048.34	324.14	3%	
	River Sand	Cft	194.48	22.00	4278.65	Cft	194.48	25.00	4862.10	-583.45	-12%	
	Labour Plastering and Hacking	Sqft	1620.70	29.00	47000.30	Sqft	1620.70	29.00	47000.30	0.00	0%	
7	walls Plastering CM 1:5 -12mm thick	Sft	9306.5			Sft	9306.5					
	OPC 43 grade cement	Bags	176.82	320.00	56583.52	Bags	176.82	310.00	54815.29	1768.24	3%	
	River Sand	Cft	1116.78	22.00	24569.16	Cft	1116.78	25.00	27919.50	-3350.34	-12%	
	Labour	Sqft	9306.50	21.00	195436.50	Sqft	9306.50	21.00	195436.50	0.00	0%	
8	Shuttering Work	Sft	6005.63			Sft	6005.63					
	Shuttering Materials	Sqft	6005.63	26	156146.38	Sqft	6005.63	26	156146.38	0.00	0%	
	Shuttering Labours	Sqft	6005.63	26	156146.38	Sqft	6005.63	18.5	111104.16	45042.23	41%	
S.no	Description											
	OUTER AND MISCELLANEOUS											
1	External wall Plastering CM 1:5 -15 mm thick	Sft	53366.24			Sft	53366.24					
	OPC 43 grade cement	Bags	1200.74	320.00	384236.93	Bags	1200.74	310.00	372229.52	12007.40	3%	
	River Sand	Cft	8004.94	22.00	176108.59	Cft	8004.94	25.00	200123.40	-24014.81	-12%	
	Labour	Sqft	53366.24	25.00	1334156.00	Sqft	53366.24	35.00	1867818.40	-533662.40	-29%	
	scaffolding	Sqft	53366.24	25.00	1334156.00	Sqft	53366.24	25.00	1334156.00	0.00	0%	
2	Lift R.C.C Wall total 7 Nos lift	Cft	6365.62			Cft	6365.62					
	OPC 43 grade cement	Bags	1336.78	320.00	427769.66	Bags	1336.78	310.00	414401.86	13367.80	3%	
	20 mm jelly	Cft	5729.06	35.00	200517.03	Cft	5729.06	25.00	143226.45	57290.58	40%	
	River Sand	Cft	3501.09	22.00	77024.00	Cft	3501.09	22.00	77024.00	0.00	0%	
	labour	Cft	6365.62	35.00	222796.70	Cft	6365.62	35.00	222796.70	0.00	0%	
	Admixture etc.,	Cft	6365.62	30.00	190968.60	Cft	6365.62	30.00	190968.60	0.00	0%	
3	River Sand bulklage 20 % for total river sand qty (161350)	Cft	32270.00	25.00	806750.00	Cft	32270.00	25.00	806750.00	0.00	0%	
4	Lift Facia Brick work	Cft	1735			Cft	1735					
	OPC 43 grade cement	Bags	78.08	320.00	24984.00	Bags	78.08	310.00	24203.25	780.75	3%	
	River Sand	Cft	607.25	22.00	13359.50	Cft	607.25	25.00	15181.25	-1821.75	-12%	
	Ordinary Brick	nos	23422.50	7.50	175668.75	nos	23422.50	6.50	152246.25	23422.50	15%	
	labour	Cft	1735.00	34.00	58990.00	Cft	1735.00	34.00	58990.00	0.00	0%	
5	Scaffolding for other work in outer	Sft	58366.24	30.00	1750987.20	Sft	58366.24	30.00	1750987.20	0.00	0%	
6	RCCC 1:1.5:3 - lintel, sunshade	Cft	2176.12			Cft	2176.12					
	OPC 43 grade cement	Bags	456.99	320.00	146235.26	Bags	456.99	310.00	141665.41	4569.85	3%	
	20 mm jelly	Cft	1958.51	35.00	68547.78	Cft	1958.51	33.00	64630.76	3917.02	6%	
	River Sand	Cft	1196.87	22.00	26331.05	Cft	1196.87	25.00	29921.65	-3596.68	-12%	
	labour	Cft	2176.12	33.00	71811.96	Cft	2176.12	33.00	71811.96	0.00	0%	
7	Concrete Cube test in lab, Slump test, materials unloading and lead charges, cleaning work, curing, Miscellaneous materials, wastage,	sft	84441.00	10.00	844410.00	sft	84441.00	10.00	844410.00	0.00	0%	
8	Safety materials and labour insurance for structure work	sft	84441.00	10.00	844410.00	sft	84441.00	10.00	844410.00	0.00	0%	
9	Reinforcement for Actual	Kg	495702.74	9	4461324.66	Kg	495702.74	7	3469919.18	591405.48	29%	
10	Reinforcement for other works	Kg	63331	40	2533240.00	Kg	63331	40	2533240.00	0.00		
11	Labour	Kg	559033.74	15	8385506.10	Kg	559033.74	15	8385506.10	0.00		
12	Ms wire for barbanding works	Kg	8608.86	65	559575.90	Kg	8608.86	65	559575.90	0.00		
	TOTAL PROJECT VALUE				86310369.38				82388370.5	3921998.88	5%	
	TOTAL AREA				84441.83				84441.83			
	RATE PER SFT				1022.128125				975.6819635			

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