Detailed Estimate of B+G+4 Commercial Building

Minor Project Report

BACHELOR OF TECHNOLOGY

(Civil Engineering)

Submitted By:

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Submitted To:

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Candidate Declaration

I hereby certify that the work which is being presented in the Project entitled Detail Estimate of B+G+4 commercial building " by "**Aryan Gupta, Ashim Ahmed, Baljender Singh**" in partial fulfillment of requirements for the award of degree of B.Tech. (Civil Engineering) submitted to the Department of Civil Engineering at **GURU NANAK DEV ENGINEERING COLLEGE, LUDHIANA** is an authentic record of my own work carried out during a period from JANUARY to JUNE. The matter presented in this project has not been submitted by me or anybody else in any other University / Institute for the award of B.Tech Degree.

Signature of the Students

Signature of Supervisor

ACKNOWLEDGEMENT

We would like to express our sincere gratitude to everyone who supported us throughout the completion of our project titled Detail Estimate of B+G+4 commercial building.

First and foremost, we are deeply thankful to our project guide, Dr. Yuvraj Singh, for his constant guidance, valuable insights, and encouragement during every stage of this project. His expert advice and support played a vital role in shaping our understanding and approach.

We also extend our heartfelt thanks to the faculty and staff of the Civil Engineering Department for providing us with the necessary resources and academic support.

Last but not least, we are grateful to our families and friends for their encouragement and moral support.

This project has been a great learning experience and has helped us grow both technically and personally.

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ABSTRACT

This project focuses on the Detail Estimation of B+G+4 commercial building The primary objective is to understand and apply practical methods of estimating quantities, costs, and material requirements involved in the construction of a multi-storey commercial structure.

In this study, we have carried out a detailed analysis of the structural components such as foundations, columns, beams, slabs, brickwork, plastering, and finishing work. Estimation has been done based on current market rates and standard practices as per CPWD and IS codes. The total cost has been categorized into material cost, labor cost, equipment cost, and contingencies.

The purpose of this project is to bridge the gap between theoretical knowledge and field application. It has given us a real-time understanding of budgeting, planning, and efficient resource management in construction projects. We also explored the importance of accurate quantity surveying for cost control and financial planning.

This project has helped us develop technical, analytical, and decision-making skills required for future professional roles in civil engineering. It also emphasizes the significance of accurate and realistic estimation in the successful execution of building projects.

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CHAPTER 1

INTRODUCTION

Costing and estimation are critical aspects of any construction project, as they lay the groundwork for understanding both financial and material requirements before actual construction begins. These elements serve as the foundation for proper planning, decision-making, and execution. Without accurate estimation, a project risks delays, budget overruns, or resource shortages that can severely impact its success.

This project, titled "Detailed Estimation of B+G+4 Commercial Building," focuses on the analysis and calculation of quantities and associated costs for a five-storey commercial structure. The building configuration includes a basement (B), ground floor (G), and four upper floors (+4). The objective of the project is to carry out a comprehensive estimation that will reflect the cost of construction, materials, and labor needed to complete the structure.

Accurate estimation plays a crucial role in several stages of the construction process. It is indispensable for budgeting, which ensures that the client and stakeholders are aware of the financial requirements from the outset. Resource planning depends heavily on precise quantities to procure the right amount of materials and hire appropriate labor. Scheduling relies on understanding how long each activity will take, which is informed by the scope of work derived from quantity estimates. Lastly, cost control is possible only when a realistic budget and material plan are already established.

In this project, we employed standard methods of quantity surveying and cost estimation, adhering to the latest Central Public Works Department (CPWD) specifications and relevant Indian Standard (IS) codes. The estimation process covers a wide range of structural and architectural components, including:

Footings and foundations, which are essential for transferring building loads safely to the ground.

Columns, beams, and slabs, which make up the structural skeleton of the building.

Brickwork, which includes walls and partitions.

Plastering, to achieve surface smoothness and protection.

Flooring and finishing, such as tiles, painting, and other interior work.

Every element has been carefully measured and calculated using standard practices. This includes preparing a detailed estimate, which lists the quantity of each item of work, followed by rate analysis, where unit costs are determined based on materials, labor, and overhead. The results are summarized in an abstract cost sheet, offering a quick overview of the entire project's cost structure.

By engaging in this estimation project, we have gained valuable practical experience. We learned how to read and interpret construction drawings, apply estimation formulas, perform rate analyses, and prepare final cost sheets. More importantly, it helped us connect theoretical knowledge from our coursework with actual construction practices, giving us insights into real-world challenges and solutions.

In conclusion, this project has not only enhanced our technical understanding of costing and estimation but also prepared us for the demands of the professional world. The skills we have acquired will play a pivotal role in our development as competent and responsible civil engineers, capable of contributing effectively to infrastructure development and project management.

CHAPTER 2

Literature Review

Costing and estimation are essential components in the construction industry, providing the basis for financial planning, resource allocation, and decision-making. A well-prepared estimate helps avoid cost overruns, delays, and resource shortages. Over the years, many authors and researchers have contributed valuable knowledge on this topic.

According to B.N. Dutta (1991) in his widely used book "Estimating and Costing in Civil Engineering", accurate estimation is crucial for determining the quantity of materials, labor requirements, and overall project cost. His methods offer a systematic approach to item-wise estimation and rate analysis, which is the foundation of most construction estimates in India.

Studies by R.C. Kohli (1994) and other professionals emphasize the importance of market analysis, local material rates, and labor costs, all of which can greatly influence the final budget. They also highlight the role of updated schedule of rates (SOR) issued by government bodies like CPWD and PWD in improving estimation accuracy.

Recent research also underlines the need for adopting software tools such as AutoCAD and MS Excel in preparing detailed estimates and bills of quantities, especially for multi-storey buildings like B+G+4 commercial structures.

In conclusion, the literature shows that cost estimation is not just a technical process but also a strategic one. For a project like ours, which involves multiple floors and complex construction elements, following standard practices along with real-time data ensures better financial control and project success.

CHAPTER 3

Objective

The main objectives of this project are as follows:

1. To prepare a detailed quantity estimate for all components of a B+G+4 commercial building, including foundation, superstructure, walls, plastering, flooring, and finishing works.
2. To carry out rate analysis for various construction activities, including material, labor, and equipment, based on current market rates.
3. To prepare an abstract cost sheet that summarizes the total cost of construction and categorizes it into different work items for better understanding and control.
4. To develop a bill of quantities (BOQ) for easy reference and procurement planning during the construction phase.

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CHAPTER 4

Methodology

4.1 The methodology adopted for this project involves a systematic approach to estimating and costing the construction of a B+G+4 commercial building. The following steps were followed:

1. **Study of Architectural and Structural Drawings**

   We began by thoroughly analyzing the building plans and structural details to understand the layout, dimensions, and types of construction elements used.

2. **Collection of Data**

   Required data, such as material specifications, construction methods, and standard dimensions, were collected from CPWD manuals, IS codes, and relevant textbooks.

3. **Quantity Estimation**

   Using the Long Wall–Short Wall and Centre Line methods, we calculated quantities of all major components including excavation, concrete, steel, brickwork, plastering, flooring, and finishing.

4. **Rate Analysis**

   Rates for each item of work were determined based on current local market prices and standard practices. This included labor charges, material costs, and equipment usage.

5. **Preparation of Abstract Cost Estimate**

   An abstract sheet summarizing the total cost under different heads (materials, labor, overheads, contingencies) was prepared using MS Excel.

6. **Bill of Quantities (BOQ)**

   A BOQ was prepared for reference during procurement and execution phases.

   Market Survey

   A market survey was conducted to gather the latest prices of construction materials, labor wages, and transportation charges in the Barewal Chungi area.

7. **Reference to Standard Codes and Practices**

   Indian Standards (IS 1200 series), CPWD Schedule of Rates (SOR), and other standard practices were referred to for uniformity in measurement and estimation.

8. **Division of Building Works**

   The building was divided into substructure and superstructure for better clarity in estimation. Each part was estimated separately.

9. **Analysis of Structural Components**

   Detailed estimation of RCC works including footings, columns, beams, slabs, and staircases was carried out using structural drawings.

10. **Estimation of Finishing Works**

    Finishing components like painting, plastering, tiling, and fixtures were calculated separately as they have variable specifications and costs.

11. **Use of Estimation Software and Excel**

    Microsoft Excel was used to prepare tables for quantity take-off, rate analysis, and abstract costing. Formulas were used to automate calculations and reduce errors.

12. **Inclusion of Overheads and Profits**

    Contractor's overheads, profits, water & electricity charges, and taxes were added to estimate the final project cost.

13. **Drafting and Documentation**

    All estimates, calculations, and assumptions were documented systematically for transparency and presentation.

14. **Team Coordination and Task Distribution**

    Project tasks were divided among team members—Aryan Gupta handled quantity estimation, Ashim Ahmed did rate analysis, and Baljinder Singh worked on documentation and BOQ.

15. **Review and Quality Check**

    All sheets and data were reviewed multiple times for accuracy. Any inconsistencies found were corrected during peer checking sessions.

16. **Cost Comparison with Similar Projects**

    We briefly compared our estimated costs with similar buildings constructed in the region to validate our estimate's realism.

17. **Final Compilation and Reporting**

    All steps, calculations, drawings, and analysis were compiled into a professional report for academic evaluation and future reference.

CHAPTER 5

Detailed estimate

Detailed estimation is a crucial part of the construction planning process. It involves the accurate calculation of quantities and costs for every component of a building project. For the B+G+4 measurements and costing of all construction activities such as earthwork, concrete work, brick masonry, plastering, flooring, doors and windows, electrical and plumbing fittings, and finishing works. This estimation is done using standard methods like the Long Wall–Short Wall and Centre Line methods, referring to architectural and structural drawings. Current market rates for materials and labor are considered to ensure realistic budgeting. The process also includes the preparation of a Bill of Quantities (BOQ), rate analysis, and an abstract cost sheet. Detailed estimation helps in financial planning, procurement, and project management, ensuring that the construction stays within budget while maintaining quality. It also provides a clear reference for cost control during execution.

Table No 1: Detailed Estimation of B+G+4 of Commercial Building

			Calculation of Basement Floor			
	Particular	No	L(m)	B(m)	Depth (m)	Total Qty
1	Site Cleaning		22.86	45.72		**1045.1592 sqm**
2	Exavation of Earth Pile					
	RCC wall footing	1	54.38	1.52	1.02	**84.310752 cum**
	Basement	1	34.66	22.86	1.21	**958.716396 cum**
3	Footing Concreting					
	F1(14'*14)	2	4.26	4.26	1.29	46.820808 **cum**
	F2(11'*14')	1	3.5	4.26	1.29	19.2339 **cum**
	F3(10'*10')	1	3.19	3.19	1.06	10.786666 **cum**
	F4(7'*11')	4	2.13	3.5	0.99	29.5218 **cum**

	F5(8'4")	9	5.108			45.972 **cum**
	F6(8'9"*8'9")	4	2.818	2.818	0.914	29.03274934 **cum**
	F7(11'6"*11'6")	1	3.504	3.504	0.609	7.477311744 **cum**
	F8(11'6"*11'6")	1	3.504	3.504	0.05	0.6139008 **cum**
	F9(8'*8')	2	2.43	2.43	0.05	0.59049 **cum**
	F10(6'*6')	6	1.82	1.82	0.05	0.99372 **cum**
	CF1(8'-9")	1	2.81	2.81	0.914	7.2170354 **cum**
	CF1(6'-3 1/8")	1	1.83	1.83	0.914	3.0608946 **cum**
					Total	**1244.348424 cum**
			Calculation of Pile			Using formula πD^2*h/4
			Dia(m)	Depth(m)	Qty(m)	Total Qty
4	PILE					
	P1	20	0.4572	10.668	1.748	34.96 **cum**
	P2	6	0.4572	10.668	1.748	10.488 **cum**
	P3	12	0.4572	7.62	1.249	14.988 **cum**
	P	28	0.4572	7.62	1.249	34.972 **cum**
	P(F6)	7	0.4572	9.144	1.499	10.493 **cum**
					Total	**105.901 cum**
			Calculation of column			
5	C1	3	0.762	0.762	3.657	6.370245324 **cum**
	C2	4	0.609	0.609	3.657	5.425247268 **cum**
	C2A	1	0.609	0.609	3.657	1.356311817 **cum**
	C3	8	0.457	0.457	3.657	6.110086344 **cum**
	C4	1	0.381	0.381	3.657	0.530853777 **cum**

	C4A	4	0.381	0.381	3.657	2.123415108 **cum**
	C5	6	0.457	0.304	3.657	3.048358176 **cum**
	C6	2	0.228	0.33	3.657	0.55030536 **cum**
	C7	6	0.457	0.457	3.657	4.582564758 **cum**
	CF1(for lift 1)	1	2.056	2.056	0.762	3.221077632 **cum**
	CF1 (for lift 2)	1	1.907	1.907	0.762	2.771126538 **cum**
					Total	**36.0895921 cum**
			Shuttering of Footing			
6	R.C.C wall	2		54.38	1.02	110.9352 **sqm**
	F1(14'*14)	2		4.26	1.29	10.9908 **sqm**
	F2(11'*14')	1		3.5	1.29	4.515 **sqm**
	F3(10'*10')	1		3.19	1.06	3.3814 **sqm**
	F4(7'*11')	4		2.13	0.99	8.4348 **sqm**
	F5(8'4")	9		5.108		45.972 **sqm**
	F6(8'9"*8'9")	4		2.818	0.914	10.302608 **sqm**
	F7(11'6"*11'6")	1		3.504	0.609	2.133936 **sqm**
	F8(11'6"*11'6")	1		3.504	0.05	0.1752 **sqm**
	F9(8'*8')	2		2.43	0.05	0.243 **sqm**
	F10(6'*6')	6		1.82	0.05	0.546 **sqm**
	CF1(8'-9")	1		2.81	0.914	2.56834 **sqm**
	CF1(6'-3 1/8")	1		1.83	0.914	1.67262 **sqm**
					Total	**201.870904 sqm**
			Shuttering of Column			
7	C1(30"*30")	3	0.762		3.657	8.359902

						sqm
	C2(24"*24")	4	0.609		3.657	8.908452 **sqm**
	C3(18"*18")	8	0.457		3.657	13.369992 **sqm**
	C4(15"*15")	1	0.381		3.657	1.393317 **sqm**
	C4A(15"*15")	4	0.381		3.657	5.573268 **sqm**
	C5(18"*12")	6	0.457		3.657	10.027494 **sqm**
	C6(9"*13")	2	0.228		3.657	1.667592 **sqm**
	C7(18"*18")	6	0.457		3.657	10.027494 **sqm**
	C2A(24"*24")	1	0.609		3.657	2.227113 **sqm**
	CF1	1	2.056		0.762	1.566672 **sqm**
	CF2	1	1.907		0.762	1.453134 **sqm**
					Total	**64.57443 sqm**
			Lift Side Wall concrete			
8	Lift (10'*8')	2	3.048	2.438	3.05	22.6646232 **cum**
	Lift(5'6")	1	1.752	1.676	3.05	8.9558736 **cum**
					Total	**54.29 cum**
			Lift Side Wall Shuttering			
8	Lift (10'*8')	2	3.048	2.438		14.862048 **cum**
	Lift(5'6")	1	1.752	1.676		2.936352 **cum**
					Total	17.7984 **cum**
			BBS of Column			

		Total No of Column	No of Bar in 1 column	Length of one bar (m)	Weight of 1 Bar	Weight (kg/m)
1	C1	3	24	4.56	2.47	270.3168
2	C2	4	4	4.855	3.85	74.767
3	C2A	1	8	4.855	3.85	149.534
4	C3	8	12	4.855	3.85	224.301
5	C4	1	12	4.855	3.85	224.301
6	C4A	4	12	4.855	3.85	224.301
7	C5	6	10	4.56	2.47	112.632
8	C6	2	10	4.365	1.58	68.967
9	C7	6	16	4.561	2.469	180.177744
					Total	**6070**
					Total	**60.7qtl**
			Ties			
1	C1	3				
	4"c/c		9	3.62	0.617	20.10186
	6"c/c		13	3.62	0.617	29.03602
	4"c/c		9	3.62	0.617	20.10186
2	C2	4	9	3.188	0.617	17.702964
	4"c/c		13	3.188	0.617	25.570948
	6"c/c		9	3.188	0.617	17.702964
	4"c/c					
3	C2A	1	9	2.578	0.617	14.315634
	4"c/c		13	2.578	0.617	20.678138
	6"c/c		9	2.578	0.617	14.315634
	4"c/c					
4	C3	8	9	1.94	0.617	10.77282
	4"c/c		13	1.94	0.617	15.56074
	6"c/c		9	1.94	0.617	10.77282
	4"c/c					
5	C4	1				
	4"c/c		9	1.636	0.617	9.084708
	6"c/c		13	1.636	0.617	13.122356
	4"c/c		9	1.636	0.617	9.084708

6	C4A	4				
	4"c/c		9	1.636	0.617	9.084708
	6"c/c		13	1.636	0.617	13.122356
	4"c/c		9	1.636	0.617	9.084708
7	C5	6	9	1.636	0.617	9.084708
	4"c/c		13	1.636	0.617	13.122356
	6"c/c		9	1.636	0.617	9.084708
	4"c/c					
8	C6	2				
	4"c/c		9	1.483	0.617	8.235099
	6"c/c		13	1.483	0.617	11.895143
	4"c/c		9	1.483	0.617	8.235099
9	C7	6				
	4"c/c		9	1.94	0.617	10.77282
	6"c/c		13	1.94	0.617	15.56074
	4"c/c		9	1.94	0.617	10.77282
					Total	**1421**
					Total	**14.21qtl**
			BBS of Footing			
			No of Bar in 1 footing	Lenght of 1 bar(m)	Weight of 1 Bar (kg/m)	Weight (Kg)
1	F1	2				
	20 dia@5"c/c bothways(bottom)		68	4.523	2.47	759.68308
	12 dia @4"c/c bothways(Top)		84	4.523	0.89	338.13948
	12 dia @8"c/c bothways		44	1.02	0.89	39.9432
	F2	1			**Total**	2275.5
	20 dia@5"c/c bothways(bottom)		84	4.523	2.47	938.43204
	12 dia @4"c/c bothways(Top)		66	3.466	0.89	203.59284
	12 dia @8"c/c bothways		66	1	0.89	58.74
					Total	1200.8

	F3	1				
	20 dia@5"c/c bothways(bottom)		42	3.306	2.47	342.96444
	12 dia @7"c/c bothways(Top)		36	3.306	0.89	105.92424
	12 dia @8"c/c bothways		32	0.789	0.89	22.47072
					Total	471.36
	F4	4				
	12dia@5"c/c bothways(bottom)		34	2.247	0.89	67.99422
	12 dia @7"c/c bothways(Top)		40	3.467	0.89	123.4252
					Total	765.68
	F6	4				
	6-20dia(bottom)		6	3.077	2.469	45.582678
	6-25dia(Top)		6	3.167	3.85	73.1577
					Total	474.96
	F7					
	16dia@6"c/c bothways(bottom)	1	46	3.451	1.58	250.81868
	10dia@8"c/c bothways(Top)		36	3.483	0.617	77.364396
					Total	328.18
	F8					
	12dia@5"c/c bothways(bottom)	1	56	3.616	0.89	180.22144
					Total	180.22
	F9	2	32	2.425	0.89	69.064
	12dia@6"c/c bothways(bottom)				**Total**	138.13
	F10	6				
	12dia@6"c/c bothways(bottom)		24	1.613	0.89	34.45368
					Total	206.72
					Total	**5861kg**
					Total	**58.61qtl**
			BBS of Pile			
			Main Bar No	Length of 1	Weight of	

				bar(m)	1 Bar (kg/m)	
2	P1	20	10	10.6164	0.89	1889.7192
	P2	6	10	710.6164	0.89	37946.91576
	P3	12	10	7.567	0.89	808.1556
	P	28	8	9.091	0.89	1812.38176
	P(F6)	7	8	9.091	0.89	453.09544
					Total	**42910.26776 kg**
					Total	**429.1 qtl**
			Ties			
			Length of one Ties (m)	Weight of 1Tie Bar	Total Weight	Units
3	P1	71	6.578	0.395	184.48001	kg
	P2	51	6.578	0.395	132.51381	kg
	P3	51	6.578	0.395	132.51381	kg
	P	61	6.578	0.395	158.49691	kg
	P(F6)	61	6.578	0.395	158.49691	kg
				Total	**766.50145**	**kg**
				Total	**7.665**	**qtl**
			Beam of Basement Floor Concreting			
1	B1	10	9.6774	0.381	0.4572	16.85737274 **cum**
2	B1A	2	4.942	0.381	0.3048	1.147817059 **cum**
3	B1A'	2	4.727	0.381	0.3048	1.097881675 **cum**
4	B2(1)	1	8.375	0.4572	0.5715	2.188302075 **cum**
5	B2(2)	1	7.848	0.4572	0.5715	2.05060235 **cum**
6	B2(3)	1	7.924	0.4572	0.5715	2.070460375 **cum**
7	B3(1)	1	1.908	0.3048	0.3048	0.177259 **cum**
8	B3(2)	1	2.667	0.3048	0.3048	0.247772408 **cum**
9	B3(3)	1	4.575	0.3048	0.3048	0.425031408

						cum
	B3(4)	2	3.8	0.3048	0.3048	0.706063104 **cum**
	B3(5)	4	3.924	0.3048	0.3048	1.458206116 **cum**
	B3(6)	2	4.191	0.3048	0.3048	0.778713281 **cum**
	B3(7)	2	3.733	0.3048	0.3048	0.693614097 **cum**
	B4(1)	1	3.8	0.2286	0.3048	0.264773664 **cum**
	B4(2)	1	3.924	0.2286	0.3048	0.273413647 **cum**
	B4(3)	1	3.924	0.2286	0.3048	0.273413647 **cum**
	B5(1)	1	1.984	0.2286	0.3048	0.138239724 **cum**
	B5(2)	2	3.279	0.2286	0.3048	0.456943602 **cum**
	B5(3)	1	2.438	0.2286	0.3048	0.169873209 **cum**
	B5(4)	1	2.136	0.2286	0.3048	0.14883067 **cum**
	B6(1)	1	7.69	0.381	1.822	5.33825958 **cum**
	B6(2)	1	6.39	0.381	1.514	3.68596926 **cum**
					Total	**40.6488126 cum**
			Beam of Ground +4 Floor Concreting			
	B1	10	9.6774	0.381	0.6223	22.94475734 **cum**
	B1A	2	4.9428	0.381	0.4699	1.769837751 **cum**
	B1A	2	4.7275	0.381	0.4699	1.692746615 **cum**
	B2(1)	1	8.3756	0.4572	0.7239	2.772047875 **cum**
	B2(2)	1	7.8486	0.4572	0.7239	2.5976 **cum**

	B2(3)	1	7.9248	0.4572	0.7239	2.622847916 **cum**
	B3(1)	1	1.9081	0.3048	0.4699	0.273288615 **cum**
	B3(2)	1	2.667	0.3048	0.4699	0.381982462 **cum**
	B3(3)	1	4.5751	0.3048	0.4699	0.655271077 **cum**
	B3(4)	2	3.8004	0.3048	0.4699	1.088628532 **cum**
	B3(5)	4	3.9243	0.3048	0.4699	2.248239633 **cum**
	B3(6)	2	4.191	0.3048	0.4699	1.200516309 **cum**
	B3(7)	2	3.7338	0.3048	0.4699	1.069550893 **cum**
	B4(1)	1	3.8004	0.2286	0.4699	0.4082357 **cum**
	B4(2)	1	3.9243	0.2286	0.4699	0.421544931 **cum**
	B4(3)	1	3.9243	0.2286	0.4699	0.421544931 **cum**
	B5(1)	1	1.9843	0.2286	0.4699	0.2131518 **cum**
	B5(2)	2	3.2797	0.2286	0.4699	0.704605107 **cum**
	B5(3)	1	2.438	0.2286	0.4699	0.261887863 **cum**
	B5(4)	1	2.136	0.2286	0.4699	0.229447283 **cum**
	B6(1)	1	7.69	0.381	0.622	1.82239158 **cum**
	B6(2)	1	6.39	0.381	0.622	1.51431498 **cum**
					Total	**47.3144674 cum**
			Calculation of Column G+4			
	C1	3	0.762	0.762	3.657	6.370245324 **cum**

	C2	4	0.609	0.609	3.657	5.425247268 **cum**
	C2A	1	0.609	0.609	3.657	1.356311817 **cum**
	C3	8	0.457	0.457	3.657	6.110086344 **cum**
	C4	1	0.381	0.381	3.657	0.530853777 **cum**
	C4A	4	0.381	0.381	3.657	2.123415108 **cum**
	C5	6	0.457	0.457	3.657	4.582564758 **cum**
	C6	2	0.228	0.228	3.657	0.380210976 **cum**
	C7	6	0.457	0.457	3.657	4.582564758 **cum**
	CF1(for lift 1)	1	2.056	2.056	0.762	3.221077632 **cum**
	CF1 (for lift 2)	1	1.907	1.907	0.762	2.771126538 **cum**
					Total	**37.4537043 cum**
			Basement Slab Shuttering			
	Basement Slab without deduction	1	28.6	16.52		472.472 sqm
	Lift	1	3.048	2.4384		7.4322432 sqm
	Opening	1	9.66	3.78		36.5148 sqm
					Total	**516.4190432** sqm
			Basement Slab calculation			
	B1	2	18	0.23	0.45	3.726 **cum**
	B2	3	15	0.23	0.45	4.6575 **cum**
	B3	2	9	0.23	0.45	1.863 **cum**
	B4	2	12	0.23	0.45	2.484 **cum**

	B5	4	10	0.23	0.45	4.14 **cum**
	B6	2	6	0.23	0.45	1.242 **cum**
	B1(A)	6	12	0.23	0.45	7.452 **cum**
					Total	**25.5645 cum**
			Basement floor finishing			
	Basement floor finishing	1	30.81	17.89	0.13	71.654817 **cum**
					Total	**71.654817 cum**
			Brick work of G+4			
1	Ground Floor					
	Wall(A)	1	33.99	0.23	3.66	28.612782 **cum**
	Wall(B)	1	22.4	0.23	3.66	18.85632 **cum**
	Wall(C)	1	42.67	0.23	3.66	35.919606 **cum**
	Wall(D)	1	14.22	0.23	3.66	11.970396 **cum**
	Wall(E)	1	18.66	0.23	3.66	15.707988 **cum**
	Wall(F)	1	5.3	0.23	3.66	4.46154 **cum**
					Total	**115.528632 cum**
2	First to Third Floor					
	Wall(A)	3	16.2	0.23	3.66	40.91148 **cum**
	Wall(B)	3	14.35	0.23	3.66	36.23949 **cum**
	Wall(C)	3	15.96	0.23	3.66	40.305384 **cum**
	Wall(D)	3	11.7	0.23	3.66	29.54718 **cum**
					Total	**147.003534 cum**

3	Forth Floor					
	Wall(A)	1	19.5	0.23	3.66	16.4151 **cum**
	Wall(B)	1	15.8	0.23	3.66	13.30044 **cum**
	Wall(C)	1	11.2	0.23	3.66	9.42816 **cum**
	Wall(D)	1	12.5	0.23	3.66	10.5225 **cum**
					Total	**49.6662 cum**
4	Terrace Floor					
	Wall(A)	1	11.65	0.23	3.66	9.80697 **cum**
	Wall(B)	1	5.5	0.23	3.66	4.6299 **cum**
	Wall(C)	1	8.2	0.23	3.66	6.90276 **cum**
	Wall(D)	1	2.82	0.23	3.66	2.373876 **cum**
					Total	**23.713506 cum**
					Total Brick work	**335.911872 cum**
			Calculate the Number of Brick used (G+4)			
		Total area	Number of Brick use in (1cum)	Total Qty		
	Ground Floor	116	500	58000		
	First to third floor	147	500	73500		
	Forth floor	50	500	25000		
	Terrace floor	24	500	12000		
			Total number of Bricks	168500		
			Calculate the Plaster (G+4)			
SL.No	Particular	No.	L(m)	H(m)	Total Qty	Units
	Ground Floor					
	Wall(A)	2	33.99	3.66	248.8068	sqm

	Wall(B)	2	22.4	3.66	163.968	sqm
	Wall(C)	2	42.67	3.66	312.3444	sqm
	Wall(D)	2	14.22	3.66	104.0904	sqm
	Wall(E)	2	18.66	3.66	136.5912	sqm
	Wall(F)	2	5.3	3.66	38.796	sqm
				Total	**1004.5968**	**sqm**
2	First to Third Floor					
	Wall(A)	2	48.6	3.66	355.752	sqm
	Wall(B)	2	43.05	3.66	315.126	sqm
	Wall(C)	2	47.88	3.66	350.4816	sqm
	Wall(D)	2	35.1	3.66	256.932	sqm
				Total	**1278.2916**	**sqm**
3	Forth Floor					
	Wall(A)	2	19.5	3.66	142.74	sqm
	Wall(B)	2	15.8	3.66	115.656	sqm
	Wall(C)	2	11.2	3.66	81.984	sqm
	Wall(D)	2	12.5	3.66	91.5	sqm
				Total	**431.88**	**sqm**
4	Terrace Floor					
	Wall(A)	2	11.65	3.66	85.278	sqm
	Wall(B)	2	5.5	3.66	40.26	sqm
	Wall(C)	2	8.2	3.66	60.024	sqm
	Wall(D)	2	2.82	3.66	20.6424	sqm
				Total	**206.2044**	**sqm**
				Total Qty of Plaster	**2920.9728**	**sqm**
			Calculation Of Motoar			
			by motar value	Total Qty	unit	
	Ground Floor	116	0.25	29	kg/m^3	
	First to third floor	147	0.25	36.75	kg/m^3	
	Forth floor	50	0.25	12.5	kg/m^3	
	Terrace floor	24	0.25	6	kg/m^3	
			Total Motar used	**84.25**	**kg/m^3**	

Table No: 2: Bar Bending Schedule For Staircase

Sr. No	Bar Mark	Bar Dia (mm)	Shape	Cut Length (mm)	Qty	Total Length (m)	Unit Wt (kg/m)	Total Wt(kg)
1	B1	10	L-shape	1432	9	12.888	0.617	7.951896
2	B2	10	L-shape	1096	9	9.864	0.617	6.086088
3	B3	8	Straight	1200	9	10.8	0.395	4.266
4	B4	8	Straight	1200	7	8.4	0.395	3.318
5	B5	10	L-shape	1432	7	10.024	0.617	6.184808
6	B6	10	L-shape	1096	5	5.48	0.617	3.38116
7	B7	10	Straight	1200	7	8.4	0.617	5.1828
8	B8	8	Straight	1200	9	10.8	0.395	4.266
	Total					76.756		

Table No.3: Bar Bending Schedule of Slab

Sr. No	Slab	Bar Type	Dia (mm)	Spacing (mm)	No. of Bars	Length of Each Bar(m)	Total length (m)	Unit Weight (kg/m3)
1	Slab-1	Main Bars	10	100	28	3.9	109.2	0.617
2	Slab-1	Distribution Bars	8	100	40	2.7	108	0.395
3	Slab-2	Main Bars	10	100	28	3.9	109.2	0.617
4	Slab-2	Distribution Bars	8	100	40	2.7	108	0.395
5	Slab-3	Main Bars	10	100	28	3.9	109.2	0.617
6	Slab-3	Distribution Bars	8	100	40	2.7	108	0.395

Table No .4 : Concrete of Slab Ground to III floor of Section

Sr No	Item	No	L(m)	B(m)	H(m)	Q(m3)
1	GH(4-6)	1	3.81	9.0678	0.1656	5.72120146
2	EG(4-6)	2	3.5433	9.0678	0.1656	10.6414347
3	DE(4-6)	1	3.4196	9.0678	0.1656	5.13496601
4	BD(4-6)	1	4.199	9.0678	0.1656	6.30533463
5	GI(1-4)	1	7.517	9.0678	0.1656	11.2877353
6	GE(1-4)	2	3.54	8.693	0.1656	10.1920905
	Half of Section					
7	1-4(E-D)	1	3.14	4.3815	0.1656	2.2783099
8	3-4(C-D)	1	2.667	6.3974	0.1656	2.82544498
9	2-4(C-D)	1	1.9087	7.345	0.1656	2.32161289

Table No .5 : Steel of Slab Ground to III floor of Section

Sr No	Item	No	L(m)	TL(m)	Wt	Total Weight
1	BM(4-6)	75	20.511	1538.325	0.617	949.146525
2	13' b/w Section 3-4 (BI)	32	24.211	750.541	0.614	460.832174
3	For Span of 17" b/w 1-4 (EI)	42	15.041	631.722	0.617	389.772474
4	For Span b/w 3-4 (BO)	12	4.68	65.16	0.617	40.20372
5	For Section 2-3 (BC)	10	2.012	20.12	0.617	12.41404

Table No 6 : Concrete of Slab Terrace

Sr No	Item	No	L(m)	B(m)	H(m)	Q(m3)
1	Section EG (4-6)	2	3.5433	9.0678	0.1656	10.6414347
2	DE(4-6)	1	3.4196	9.067	0.1656	5.13451299
3	BD(4-6)	1	4.199	9.067	0.1656	6.30477834
4	GE(1-4)	2	3.543	8.8678	0.1656	10.4058454
	Half of Section					
5	1-4(E-D)	1	3.14	4.3815	0.1656	2.2783099
6	3-4(C-D)	1	2.667	6.3974	0.1656	2.82544498
7	2-4(B-C)	1	1.9081	7.345	0.1656	2.32088309

Table No 7 :Steel Bar Terrace For Section B-G (4-6)

Sr No	Item	No	L(m)	TL(m)	Wt	Total Wt
1	BG(4-6)	75	16.32	1224	0.1656	202.6944
2	For Streach of 13' b/w 3-4(BG)	32	16.32	50.92	0.617	31.41764
3	For Span 3' b/w 3-4 (E-B)	7	8.58	60.06	0.617	37.05702
4	For Span of 5' b/w 3-4 (B-D)	12	4.698	56.16	0.617	34.65072
5	For Section 2-3 (BC)	10	2.012	20.12	0.617	12.41404
6	For Span of 17" b/w 1-4 (GE)	42	7.1	284	0.617	175.228

Sr No.	Item Description	No. of items	Length (m)	Width (m)	Thickness (m)	Quantity	Units
1	RCC for Beam						
	B1	10	9.6774	0.38	0.622	22.94	cum
	B1A	2	4.9428	0.38	0.47	1.77	cum
	B1A	2	4.7275	0.38	0.47	1.693	cum
	B2(1)	1	8.3756	0.46	0.724	2.772	cum
	B2(2)	1	7.8486	0.46	0.724	2.598	cum
	B2(3)	1	7.9248	0.46	0.724	2.623	cum
	B3(1)	1	1.9081	0.3	0.47	0.273	cum
	B3(2)	1	2.667	0.3	0.47	0.382	cum
	B3(3)	1	4.5751	0.3	0.47	0.655	cum
	B3(4)	2	3.8004	0.3	0.47	1.089	cum
	B3(5)	4	3.9243	0.3	0.47	2.248	cum
	B3(6)	2	4.191	0.3	0.47	1.201	cum
	B3(7)	2	3.7338	0.3	0.47	1.07	cum
	B4(1)	1	3.8004	0.23	0.47	0.408	cum
	B4(2)	1	3.9243	0.23	0.47	0.422	cum
	B4(3)	1	3.9243	0.23	0.47	0.422	cum
	B5(1)	1	1.9843	0.23	0.47	0.213	cum
	B5(2)	2	3.2797	0.23	0.47	0.705	cum
	B5(3)	1	2.438	0.23	0.47	0.262	cum
	B5(4)	1	2.136	0.23	0.47	0.229	cum
	B6(1)	1	7.69	0.38	0.622	1.822	cum
	B6(2)	1	6.39	0.38	0.622	1.514	cum
					Total	**48.63**	**cum**

Table No 9: Beam Detail of Terrace

RCC for Terrace	No	L(m)	B(m)	H(m)	Qty	Units
B1	8	9.6774	0.381	0.6223	18.3558	cum
B2(2)	1	7.8486	0.4572	0.7239	2.59763	cum
B3(1)	1	1.9081	0.3048	0.4699	0.27329	cum
B3(2)	1	2.667	0.3048	0.4699	0.38198	cum
B3(3)	1	4.5751	0.3048	0.4699	0.65527	cum
B3(4)	2	3.8004	0.3048	0.4699	1.08863	cum
B3(5)	4	3.9243	0.3048	0.4699	2.24824	cum
B4(1)	1	3.8004	0.2286	0.4699	0.40824	cum
B4(2)	1	3.9243	0.2286	0.4699	0.42154	cum
B4(3)	1	3.9243	0.2286	0.4699	0.42154	cum
B5(1)	1	1.9843	0.2286	0.4699	0.21315	cum
B5(2)	2	3.2797	0.2286	0.4699	0.70461	cum
B5(3)	1	2.438	0.2286	0.4699	0.26189	cum
B5(4)	1	2.136	0.2286	0.4699	0.22945	cum
B6(1)	1	7.69	0.381	0.622	1.82239	cum
B6(2)	1	6.39	0.381	0.622	1.51431	cum
				Total	34.37	cum

Table No 11: Steel of Slab Ground to III floor of Section

Sr No	Item	No	L(m)	B(m)	H(m)	Q(m3)
1	GH(4-6)	1	3.81	9.0678	0.1656	5.72120146
2	EG(4-6)	2	3.5433	9.0678	0.1656	10.6414347
3	DE(4-6)	1	3.4196	9.0678	0.1656	5.13496601
4	BD(4-6)	1	4.199	9.0678	0.1656	6.30533463
5	GI(1-4)	1	7.517	9.0678	0.1656	11.2877353
6	GE(1-4)	2	3.54	8.693	0.1656	10.1920905
	Half of Section					
7	1-4(E-D)	1	3.14	4.3815	0.1656	2.2783099
8	3-4(C-D)	1	2.667	6.3974	0.1656	2.82544498
9	2-4(C-D)	1	1.9087	7.345	0.1656	2.32161289

Table No 12: Concrete of Slab Terrace (4-6)

Sr No	Item	No	L(m)	TL(m)	Wt	TWt(kg)
1	BM(4-6)	75	20.511	1538.325	0.617	949.146525
2	13' b/w Section 3-4 (BI)	32	24.211	750.541	0.614	460.832174
3	For Span of 17" b/w 1-4 (EI)	42	15.041	631.722	0.617	389.772474
4	For Span b/w 3-4 (BO)	12	4.68	65.16	0.617	40.20372
5	For Section 2-3 (BC)	10	2.012	20.12	0.617	12.41404

Table No 13: Steel Bar Terrace for Section B-G (4-6)

Sr No	Item	No	L(m)	B(m)	H(m)	Q(m3)
1	Section EG (4-6)	2	3.5433	9.0678	0.1656	10.6414347
2	DE(4-6)	1	3.4196	9.067	0.1656	5.13451299
3	BD(4-6)	1	4.199	9.067	0.1656	6.30477834
4	GE(1-4)	2	3.543	8.8678	0.1656	10.4058454
	Half of Section					
5	1-4(E-D)	1	3.14	4.3815	0.1656	2.2783099
6	3-4(C-D)	1	2.667	6.3974	0.1656	2.82544498
7	2-4(B-C)	1	1.9081	7.345	0.1656	2.32088309
Sr No	Item	No	L(m)	TL(m)	Wt	TWt(kg)
1	BG(4-6)	75	16.32	1224	0.1656	202.6944
2	For Streach of 13' b/w 3-4(BG)	32	16.32	50.92	0.617	31.41764
3	For Span 3' b/w 3-4 (E-B)	7	8.58	60.06	0.617	37.05702

4	For Span of 5' b/w 3-4 (B-D)	12	4.698	56.16	0.617	34.65072
5	For Section 2-3 (BC)	10	2.012	20.12	0.617	12.41404
6	For Span of 17" b/w 1-4 (GE)	42	7.1	284	0.617	175.228

Table No 15: ABSTRACT Sheet

Sr.NO	PARTICULAR	QTY
1	Site Cleaning	1045.159 sqm
2	Earth Pile Excavation	84.31075 cum
	Basement	958.71cum
3	Footing Concreting	1244.43 cum
4	Pile	105.901 cum
6	Shuttering of footing	201.87 sqm
7	Shuttering of Column	64.57 sqm
8	Lift Side Wall Concrete	54.29 cum
9	Lift Side Wall shuttering	17.798 sqm
10	BBS of column (qtl)	60.7 qtl
11	Ties in Column(qtl)	14.21 qtl
12	BBS of footing (qtl)	58.61 qtl
13	BBS of Pile(qtl)	429.1 qtl
14	Ties in Pile(qtl)	7.665 qtl
15	Beam Basement Floor Concreting	40.64881cum
16	Beam G+4 Floor Concreting	189.256 cum
17	Column B+G+4 Concreting	216.5154 cum
18	Basement Beam Slab Shuttering	516.419 cum
19	Basement floor finishing	71.6548 cum
20	Brick Work G+4	2015.46 cum
21	Plaster G+4	2920.973 cum
22	Motar G+4 (kg/m^3)	84.25 cum
23	RCC Beam	48.62501cum
24	RCC terrace Beam	34.37002 cum
25	Concrete of Slab Ground to III floor of Section	56.887 cum
26	Steal of Slab Ground to III floor of Section	18.52 qtl
27	Concrete of Slab Terrace	39.91116 cum
28	Steel Bar Terrace for Section B-G (4-6)	4.934 qtl

Table No 15: Cost Sheet

Sr.NO	PARTICULAR	QTY	RATE(Rs)	Total Cost (Rs)
1	Site Cleaning	1045.159	182	190219
2	Earth Pile Excavation	84.31075	327	27569.62
	Basement	958.71	327	313498.2
3	Footing Concreting	1244.43	5385	6701256
4	Pile	105.901	5385	570276.9
6	Shuttering of footing	201.87	210	42392.7
7	Shuttering of Column	64.57	210	13559.7
8	Lift Side Wall Concrete	54.29	5385	292351.7
9	Lift Side Wall shuttering	17.798	210	3737.58
10	BBS of column (qtl)	60.7	5600	339920
11	Ties in Column(qtl)	14.21	5600	79576
12	BBS of footing (qtl)	58.61	5500	322355
13	BBS of Pile(qtl)	429.1	5600	2402960
14	Ties in Pile(qtl)	7.665	5600	42924
15	Beam Basement Floor Concreting	40.64881	5385	218893.9
16	Beam G+4 Floor Concreting	189.256	5385	1019144
17	Column B+G+4 Concreting	216.5154	5385	1165935
18	Basement Beam Slab Shuttering	516.419	210	108448
19	Basement floor finishing	71.6548	5385	385861.1
20	Brick Work G+4	2015.46	5013	1010350
21	Plaster G+4	2920.973	233	680586.7
22	Motar G+4 (kg/m^3)	84.25	5013	422345.3
23	RCC Beam	48.62501	5385	261845.7
24	RCC terrace Beam	34.37002	5385	185082.5
25	Concrete of Slab Ground to III floor of Section	56.887	5385	306336.5
26	Steal of Slab Ground to III floor of Section(qtl)	18.52	5600	10373255
27	Concrete of Slab Terrace	39.91116	5385	214921.6
28	Steel Bar Terrace For Section B-G (4-6) (qtl)	4.934	5600	2763386
			Total	Rs 3,95,57,999
	Add of 5%	1977900		
			Total	**Rs4,15,35,899**

CHAPTER 6

CONCLUSION

1. The project provided a thorough understanding of construction cost estimation, highlighting the importance of accurate quantity calculations and rate analysis for successful project execution.
2. Through the use of standard estimation methods and the preparation of detailed cost reports, a comprehensive approach to managing construction budgets and resources was established.
3. By integrating architectural and structural drawings with market data for material and labor rates, the process demonstrated how up-to-date information contributes to more precise cost estimates.
4. The project emphasized the significance of utilizing proper software tools and referring to industry standards like IS codes and CPWD manuals to ensure the accuracy and consistency of the estimation process.
5. The hands-on experience gained from this project is invaluable for future roles in construction management, showcasing the necessity of teamwork, attention to detail, and a systematic approach in delivering cost-effective solutions.

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