

PROJECT MANAGEMENT USING M.S PROJECT FOR INDRAPRASTH GREENS AT AHMEDABAD

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CHAPTER 1: - INTRODUCTION

Project Management is the Application of knowledge, skills and Techniques to project activities to meet project requirements. It is a strategic ability to do something successfully for organizations, enabling them to patch the project results to Organizational goals and thus, better compete in their markets. It can be also defined as the process and activity of planning, organizing, inspiring, and controlling resources, procedures and protocols to achieve specific goals in scientific or daily problems. Construction activities are not limited only to the physical activity of allocating men, materials and machines, it involves more than this, such as effective management of man power, machinery as well as materials by proper planning using project management tools such as Microsoft Project, Primavera, Microsoft Excel and techniques such as CPM, PERT which can reduce the efforts and also helps to maintain the accuracy and quality of the project.

1.1 About Microsoft project

Microsoft Project is a project management software program developed and sold by Microsoft, which is designed to assist a project manager in developing a plan, assigning resources to tasks, tracking progress, managing the budget, and analysing workloads. The application creates critical path schedules, and critical chain and event chain methodology third-party plug-ins are also obtainable. Schedules can be resource levelled, and task networks are visualized in a Gantt chart. Additionally, Microsoft Project can identify divergent classes of the users. These different classes of users can have differing access levels to projects, views, and other data. Customization of aspects in Microsoft Project such as calendars, views, tables, filters, and fields are stored in an enterprise global which is accessible by all users.

1.2 Information about indraprasth greens

Indraprasth greens has total 10 block each block has 7 floor and on each floor 4 flats will be provided. There are two types of flats 1st type of flat has 2300 sqft built-up area and the 2nd type has 1850 sqft built-up area. There are 5 blocks of each types of flat.



Fig. 1.2.1 Layout of whole project (autocade)

1.3 Objectives

- 1) To reduce the total duration.
- 2) To ease of work for the Labour.
- 3) Planning and scheduling of residential building.
- 4) To prepare a realistic schedule and set baseline.
- 5) To prepare the graph of the planning and scheduling.

1.4 Scope

Project scope is the part of project planning that involves determining and documenting a list of specific project goals, deliverable, tasks, costs and deadlines. These deliverables are derived from a project's requirements. In construction, delay could

be defined as the time over run either beyond completion. Date specified in a contract, or beyond the date that the parties agreed upon for delivery of a project.

CHAPTER 2: - LITERATURE REVIEW

Vittal Anantatmula, Planning Techniques for Academic Advising and Learning, (2010), Journal of Engineering Research and Applications www.ijera.com ISSN: 2248-9622, Vol. 4, Issue 6 (Version 5)

Description: - Found out that Similar to a traditional project, managing an academic degree is related to the triple constraints of time, cost, and scope. It is concluded that by applying project management concepts, tools, and techniques, undergraduate degree program advising and planning can be improved after comparing the planning aspects of a conventional business project with the planning of an academic degree.

R. Prabhakar and G. Ravichandran, Optimal planning and scheduling in multi-storied building, (2014), Journal of Mechanical and Civil Engineering (IOSR)

Description: - Analysed that; Construction planning is an important part of the overall management process. The planning and management include organizing the work, executing the work, correlating plan and progress information and controlling the work, the three inter-related factors of time, money and quality need to be managed in a proper way. Completion of many of the projects nowadays is not in estimated duration.

Hoang, Nhat Minh Shrestha, Swastik, Project management software and its utilities (2014), Lahti University of Applied Sciences Degree Programmed in Business Information Technology

Description: - Hinted that the main function of a software is to offer help, and enhance the quality of output with less effort than manual ways. A project has disparate requirements and the aim of the adopted software is to fulfil those requirements effectively in terms of time and cost. In addition, the issues of scheduling, tracking and physical element must be considered while adopting the project management software.

Minh Shrestha Optimal planning and scheduling in multi-storied building, (2014), International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET)

Description: - Develop the quality of output with less effort than manual ways. A project has disparate requirements and the aim of the adopted software is to fulfil those requirements effectively in terms of time and cost. In addition, the issues of scheduling, tracking and physical element must be considered while adopting the project management software.

J. Jayalakshmi, Planning and Scheduling of High-Rise Building Using Primavera, (2014), International Journal of Engineering Research and Applications (IJERA) SSN: 2248-9622, Vol. 4, Issue 6 (Version 5)

Description: - This study compared time performance of the conventional method of construction for high-rise residential and Industrial Building System (IBS) method by overall construction period. The scheduling was developed using Primavera project planning software. The positive changes include creating a healthy working environment among those involved directly in the construction industry. The major players in the area architects, engineers, town planner, developer, contractor and the supplier or manufacturer have to play their roles in enhancing their working system, management and administration to enable the modernization in the industry.

Rhuta Joshi and Prof. V.Z. Patil, Resource Scheduling of Construction Project, (2015), International Journal of Science and Research (IJSR) ISSN: 2319-7064

Description: - Analysed the project management technique by scheduling various construction activities, allocation of resources and resource levelling using Microsoft Project 2013 for residential building.

The study was carried out in two phases. In first phase data was collected from site and quantities were calculated as per drawing and required manpower was calculated. In second phase of construction activities was defined in MSP 2013. The result was as resource decreases duration increased by 10.38% and cost by 0.94%.

CHAPTER 3: - METHODOLOGY

In this thesis E-block is select for the research of planning and scheduling in Microsoft Project. From excavation to finishing work schedule should be generated in Microsoft project and notify the critical path. Resource allocation of ever work and material should be provided. Cost of the work and material should be calculated in M.S project. After the critical path has set then duration should be minimizing in its possible ways and how much workers have to increase or decrease should be calculated and by that how much cost was increase should be notify.

3.1 Data collection

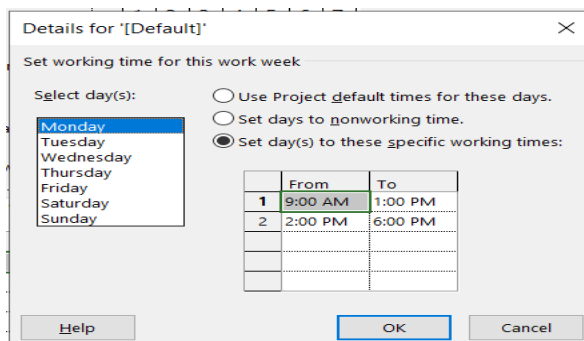
Activity name	Start date	End date
Block-E		
Clearing of plot	3/7/2020	4/7/2020
planning	3/7/2020	4/7/2020
Marking of excavation	4/7/2020	4/7/2020
Excavation	4/7/2020	8/7/2020
Concrete work		
Basement		
p.c.c	8/7/2020	9/7/2020
Footing, column and lift padi	9/7/2020	21/7/2020
Slab, beam, starter and stair	16/7/2020	31/7/2020
Ground floor		
column and lift padi	25/7/2020	4/8/2020
Slab, beam, starter and stair	1/8/2020	15/8/2020
Masonry work		
Ground floor	5/12/2020	17/12/2020
1 st floor	12/12/2020	27/12/2020
Outer plaster		
East	1/3/2021	6/3/2021
West	6/3/2021	10/3/2021
Plumbing work		
1 st floor	8/3/2021	14/3/2021
Internal plaster work		
Ground floor	21/4/2021	22/4/2021
Basement i.p.s	6/7/2021	7/7/2021
Terrace i.p.s	7/7/2021	8/7/2021

3.2 Data analysis

Activity name	Start date	End date
E-block		
Clearing of plot	3/7/2020	4/7/2020
planning	3/7/2020	4/7/2020
Marking of excavation	4/7/2020	4/7/2020
Excavation	4/7/2020	8/7/2020
Concrete work		
Basement		
Footing, column and lift padi		
Reinforcement marking	9/7/2020	10/7/2020
Bar cutting	9/7/2020	11/7/2020
Bar bending	11/7/2020	11/7/2020
Reinforcement placing	11/7/2020	12/7/2020
Bar tying	11/7/2020	12/7/2020
Formwork	12/7/2020	14/7/2020
Concreting	14/7/2020	15/7/2020
Side openings	15/7/2020	16/7/2020
Curing	15/7/2020	21/7/2020
Slab, beam, starter and stair		
Formwork	16/7/2020	9/7/2020
Bar cutting	19/7/2020	21/7/2020
Bar bending	21/7/2020	23/7/2020
Reinforcement placing	21/7/2020	24/7/2020
Bar tying	21/7/2020	24/7/2020
Electric pipe and ceiling point placing	24/7/2020	25/7/2020
Concrete	25/7/2020	25/7/2020
Formwork opening	7/31/2020	31/7/2020
Masonry work		
Ground floor		
Masonry up to lintel	5/12/2020	6/12/2020
Lintel formwork	7/12/2020	7/12/2020

CHAPTER 4: - RESULT AND DISCUSSION

4.1 calendar to show the working hours



Details for '[Default]'

Set working time for this work week

Select day(s):

- ☐ Use Project default times for these days.
- ☐ Set days to nonworking time.
- ☒ Set day(s) to these specific working times:

	From	To
1	9:00 AM	1:00 PM
2	2:00 PM	6:00 PM

Help OK Cancel

Fig no. 4.1.2 working hours Monday to Sunday

Monday to Sunday 8 hours of shifts 1) 09:00 AM to 01:00 PM and 2) 02:00 PM to 06:00 PM.

4.2 Planning and scheduling of indraprasth greens using M.S project

Task Mode	Task Name	Duration	Start	Finish	Prede	Resource Names	Cost	2018	2019	2020	2021	2022	2023	2024
2	Clearing plot	2 days	Fri 7/3/20	Sat 7/4/20		J.C.B.,Junior engin	₹7,800.00							
3	Planning	2 days	Fri 7/3/20	Sat 7/4/20	255	Senior engineer,Jui	₹9,000.00							
4	Marking excavation portion	1 day	Sat 7/4/20	Sat 7/4/20	3	Senior engineer, Surveyor,Withing	₹7,045.00							
5	Excavation	6 days	Sat 7/4/20	Wed 7/8/20	455	Excavator,Dumper	₹81,000.00							
6	CONCRETE WORK	193 days	Wed 7/8/20	Fri 12/25/20			₹18,841,012.50							
7	BASMENT	29 days	Wed 7/8/20	Fri 7/31/20			₹2,250,460.50							
8	p.c.c	1 day	Wed 7/8/20	Thu 7/9/20	5	Karigar,Male labo.	₹95,050.00							
9	Footing, column and lift pad	15 days	Thu 7/9/20	Tue 7/21/20			₹1,167,080.50							
10	Reinforcement marking	1 day	Thu 7/9/20	Fri 7/10/20	8	Bar bending and tying karigar	₹2,300.00							
11	Bar cutting	2 days	Thu 7/9/20	Sat 7/11/20	1055	Bar bending and ty	₹201,105.00							
12	Bar bending	1 day	Sat 7/11/20	Sat 7/11/20	11	Bar bending and ty	₹4,700.00							
13	Reinforcement placing	2 days	Sat 7/11/20	Sun 7/12/20	12	Bar bending and tying karigar	₹13,800.00							
14	Bar tying	2 days	Sat 7/11/20	Sun 7/12/20	1355	Bar bending and ty	₹12,657.50							
15	Formwork	2 days	Sun 7/12/20	Tue 7/14/20	14	Farma,Kay,Teka,Ni	₹8,906.00							
16	Concreting	1 day	Tue 7/14/20	Wed 7/15/20	15	Karigar,Male labo.	₹919,862.00							
17	Sides opening	1 day	Wed 7/15/20	Thu 7/16/20	16	Formwork labour	₹2,700.00							
18	Curing	7 days	Wed 7/15/20	Tue 7/21/20	1755	Male labour[50%]	₹1,050.00							

Task Mode	Task Name	Duration	Start	Finish	Prede	Resource Names	Cost	2018	2019	2020	2021	2022	2023	2024
179	Slab, beam, starter and stair	19 days	Thu 12/10/20	Fri 12/25/20			₹988,330.00							
180	Formwork	4 days	Thu 12/10/20	Sat 12/12/20	177	Formwork labour	₹26,845.00							
181	Bar cutting	2 days	Sat 12/12/20	Sun 12/13/20	180	Bar bending and ty	₹43,495.00							
182	Bar bending	2 days	Sun 12/13/20	Wed 12/16/20	181	Bar bending and ty	₹9,400.00							
183	Reinforcement placing	3 days	Sun 12/13/20	Thu 12/17/20	18255	Bar bending and tying karigar	₹23,100.00							
184	Bar tying	3 days	Sun 12/13/20	Thu 12/17/20	18355	Bar bending and ty	₹14,230.00							
185	Electric pipe and ceiling point placing	1 day	Thu 12/17/20	Fri 12/18/20	184	Electric pvc pipe [56 per m] Fan point box[9	₹4,910.00							
186	Concreting	1 day	Fri 12/18/20	Sat 12/19/20	185	Karigar[200%],Mal	₹862,000.00							
187	Curing	7 days	Sat 12/19/20	Thu 12/24/20	186	Mason labour[50%]	₹1,050.00							
188	Formwork opening	1 day	Thu 12/24/20	Fri 12/25/20	187	Breaker, Formwork	₹3,300.00							
189	MASONARY WORK	119 days	Sat 12/5/20	Sat 3/6/21			₹5,995,165.00							
190	GROUND FLOOR	16 days	Sat 12/5/20	Thu 12/17/20			₹473,605.00							
191	Masonry upto lintel	4 days	Sat 12/5/20	Sun 12/6/20	171	Brick [22,310 per n	₹188,450.00							
192	Lintel formwork	1 day	Mon 12/7/20	Mon 12/7/20	191	Farma,Formwork l	₹4,500.00							
193	Lintel bar cutting and bending	1 day	Tue 12/8/20	Tue 12/8/20	192	Bar bending and tying karigar	₹19,530.00							
194	Lintel concreting	1 day	Wed 12/9/20	Wed 12/9/20	193	Aggregate 4 mm[6	₹168,900.00							
195	Masonry lintel to beam bottom	2 days	Thu 12/10/20	Fri 12/11/20	194	Brick [11, 845 per nos],Ceme	₹91,175.00							
196	Curing	7 days	Sat 12/12/20	Thu 12/17/20	195	Male labour[50%]	₹1,050.00							

4.3 Work overview



Fig no. 4.3.1 Work overview

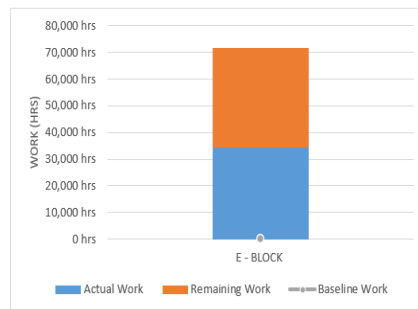


Fig no. 4.3.2 Work hours bar graph

4.4 Resource allocation and cost calculation

	Resource Name	Type	Initials	Std. Rate	Work	Cost
28	Silo operator	Work	S	₹1,500.00/day	208 hrs	₹39,000.00
29	Scaffolding placer	Work	S	₹600.00/day	256 hrs	₹19,200.00
30	Bamboo	Cost	B			₹0.00
31	H-frame Placer	Work	H	₹600.00/day	960 hrs	₹72,000.00
32	Tiles karigar	Work	T	₹900.00/day	3,096 hrs	₹348,300.00
33	Tiles labour	Work	T	₹300.00/day	4,200 hrs	₹157,500.00
34	Carpenter	Work	C	₹1,000.00/day	1,200 hrs	₹150,000.00
35	Surveyor	Work	S	₹4,000.00/day	8 hrs	₹4,000.00
36	Junior engineer	Work	J	₹1,500.00/day	8,456 hrs	₹1,585,500.00
37	Senior engineer	Work	S	₹3,000.00/day	2,752 hrs	₹1,032,000.00
38	Supervisor	Work	S	₹1,200.00/day	80 hrs	₹12,000.00
39	Teka	Cost	T			₹0.00
40	Farma	Cost	F			₹0.00
41	Plank	Cost	P			₹0.00
42	Nail 2.5 X 8	Material	N	₹63.00	243 per kg	₹15,309.00
43	Nail 4 X 8	Material	N	₹70.00	135 per kg	₹9,450.00
44	Key	Cost	K			₹0.00
45	Cement o.p.c	Material	C	₹400.00	38,687 per bag	₹15,474,800.00
46	Sand non filter	Material	S	₹500.00	1,659.65 per m3	₹829,825.00
47	Sand filtered	Material	S	₹650.00	491.2 per m3	₹319,280.00
48	Aggregate 4 mm	Material	A	₹620.00	960.19 per m3	₹595,317.80
49	Aggregate 10 mm	Material	A	₹680.00	960.19 per m3	₹652,929.20
50	Reinforcement 8 mm	Material	R	₹45.00	344 per kg	₹15,480.00
51	Reinforcement 12 mm	Material	R	₹42.00	3,880 per kg	₹162,960.00
52	Reinforcement 16 mm	Material	R	₹40.00	10,250 per kg	₹410,000.00
53	Reinforcement 20 mm	Material	R	₹40.00	19,399 per kg	₹775,960.00
54	Binding wire	Material	B	₹65.00	203.5 per kg	₹13,227.50

4.5 Resources overview

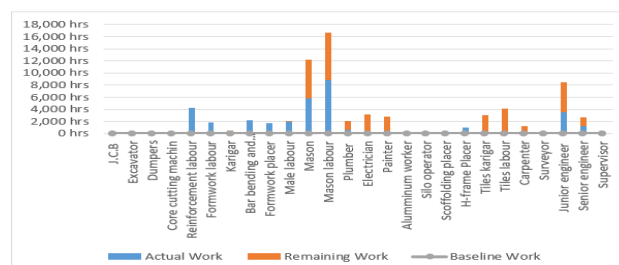


Fig no. 4.5.1 Specific work hour of resources bar graph

4.6 Cost overview

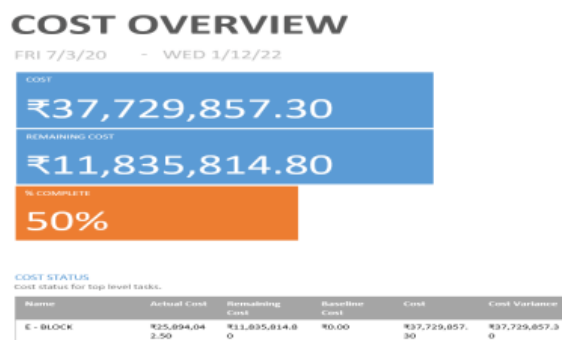


Fig no. 4.6.1 Cost overview

4.7 Particular change can decrease duration and cost.

1. First change in concrete work 7th floor

169	✓		7TH FLOOR	31 days	Wed 11/11/20	Fri 12/25/20			₹2,112,144.00	100%
170	✓		Column and lift padi	19 days	Wed 11/11/20	Tue 12/15/20			₹1,123,814.00	100%
171	✓		Bar cutting	5 days	Wed 11/11/20	Sat 12/5/20	168	Bar bending and ty	₹135,630.00	100%
172	✓		Bar bending	2 days	Sat 12/5/20	Sun 12/6/20	171	Bar bending and ty	₹9,400.00	100%
173	✓		Reinforcement placing	4 days	Sat 12/5/20	Sun 12/6/20	17255	Bar bending and tying karigar	₹30,800.00	100%
174	✓		Bar tying	3 days	Sat 12/5/20	Sun 12/6/20	17355	Bar bending and ty	₹15,270.00	100%
175	✓		Formwork	2 days	Sun 12/6/20	Mon 12/7/20	174	Farma,Key,Teka,Ni	₹8,906.00	100%
176	✓		Concreting	1 day	Tue 12/8/20	Tue 12/8/20	175	Karigar,Male labou	₹919,458.00	100%
177	✓		Sides opening	1 day	Wed 12/9/20	Wed 12/9/20	176	Formwork placere	₹3,300.00	100%
178	✓		Curing	7 days	Thu 12/10/20	Tue 12/15/20	177	Male labour[50%]	₹1,050.00	100%

In 7th floor concrete work, the duration is 19 days and its cost is 1,123,814. The duration is 4 days more than the other floors column and lift padi activity and the cost also 43,800 more than the other floors column and lift padi activity. Due to of Diwali festivals required workers were not come back that's why the duration was increase and in increase in duration increase the cost. There are 2 bar tying, bending and cutting person and 4 labour or helper of the bar worker. After increase 4 bar tying, bending and cutting person and 8 labour or helper of bar worker duration were be decrease and the duration were decrease the cost were also decrease. 4 days of duration were decrease and 43,800 Rs were also be decrease.

2. Second change in masonry work 4th floor

218	✓		4TH FLOOR	24 days	Tue 1/12/21	Sun 1/31/21			₹816,780.00
219	✓		Masonry upto lintel	8 days	Tue 1/12/21	Tue 1/19/21	216	Brick [46,460 per m	₹406,250.00
220	✓		Lintle formwork	1 day	Tue 1/19/21	Wed 1/20/21	219	Farma,Formwork l	₹4,500.00
221	✓		Lintle bar cutting and bending	1 day	Wed 1/20/21	Thu 1/21/21	220	Bar bending and tying karigar	₹19,530.00
222	✓		Lintel concreting	1 day	Thu 1/21/21	Fri 1/22/21	221	Aggregate 4 mm[6	₹168,900.00
223	✓		Masonry lintel to beam bottom	6 days	Fri 1/22/21	Tue 1/26/21	222	Brick [24, 380 per nos],Ceme	₹216,550.00
224	✓		Curing	7 days	Tue 1/26/21	Sun 1/31/21	223	Male labour[50%]	₹1,050.00

In 4th floor masonry work the lintel activity has 3 days more than the other floor activity and cost is increase by 32,700. Due to of material comes late for that the days is increase and the cost is also increased. If the material comes on the time duration will decrease to 3 days and cost also decrease to 32,700.

3. Third change in outer plaster work

Task ID	Task Mode	Task Name	Duration	Start	Finish	Predecessor	Resource Names	Cost
247	✓	OUTER PLASTER WORK	30 days	Mon 3/1/21	Thu 4/8/21			₹401,400.00
248	✓	EAST	6 days	Mon 3/1/21	Sat 3/6/21			₹77,400.00
249	✓	H-frame scaffolding part 1	2 days	Mon 3/1/21	Tue 3/2/21	245	H-frame, H-frame	₹10,200.00
250	✓	Part 1 plaster	1 day	Wed 3/3/21	Wed 3/3/21	249	Cement p.p.c[37 p	₹28,500.00
251	✓	H-frame scaffolding part 2	2 days	Thu 3/4/21	Fri 3/5/21	250	H-frame, H-frame	₹10,200.00
252	✓	Part 2 plaster	1 day	Sat 3/6/21	Sat 3/6/21	251	Cement p.p.c[37 p	₹28,500.00
253	✓	WEST	6 days	Sat 3/6/21	Wed 3/10/21			₹77,400.00
254	✓	H-frame scaffolding part 1	2 days	Sat 3/6/21	Sun 3/7/21	252	H-frame, H-frame	₹10,200.00
255	✓	Part 1 plaster	1 day	Sun 3/7/21	Sun 3/7/21	254	Cement p.p.c[37 p	₹28,500.00
256	✓	H-frame scaffolding part 2	2 days	Sun 3/7/21	Tue 3/9/21	255	H-frame, H-frame	₹10,200.00
257	✓	Part 2 plaster	1 day	Tue 3/9/21	Wed 3/10/21	256	Cement p.p.c[37 p	₹28,500.00
258	✓	NORTH	9 days	Wed 3/10/21	Fri 3/19/21			₹123,300.00
259	✓	H-frame scaffolding part 1	2 days	Wed 3/10/21	Fri 3/12/21	257	H-frame, H-frame	₹10,200.00
260	✓	Part 1 plaster	1 day	Fri 3/12/21	Sun 3/14/21	259	Cement p.p.c[42 p	₹30,900.00
261	✓	H-frame scaffolding part 2	2 days	Sun 3/14/21	Mon 3/15/21	260	H-frame, H-frame	₹10,200.00
262	✓	Part 2 plaster	1 day	Mon 3/15/21	Tue 3/16/21	261	Cement p.p.c[42 p	₹30,900.00
263	✓	H-frame scaffolding part 3	2 days	Tue 3/16/21	Thu 3/18/21	262	H-frame, H-frame	₹10,200.00
264	✓	Part 3 plaster	1 day	Thu 3/18/21	Fri 3/19/21	263	Cement p.p.c[42 p	₹30,900.00

In outer plaster work there are 48 nos of H-frame for scaffolding so after one part plaster completed then 1 day duration to remove and place to another part. So, if the H-frame are 96 nos it will minimize the 4 days duration.

CHAPTER 5: - CONCLUSION

- First change: - If bar tying, bending and cutting person increase from 2 person to 4 person and labour or helper increase from 4 person to 8 person it will decrease the duration by 4 days and cost by 43,800.
- Second change: - If the material (brick) come on time it will decrease the duration by 3 days and decrease the cost of 32,700
- Third change: - If H-frame is 96 nos rather than 48 nos it will minimize the duration by 4 days.
- Total 11 days of duration can be minimizing after applying all three change and total duration became 654 days to 643 days.
- Total 76,500 Rs cost can be decrease after applying the first and second change to 37,729,857 Rs to 37,653,357 Rs.

CHAPTER 6: - REFERENCE

- Abhishek Sharma (2015) Many project suffers time and cost overruns due to improper planning, scheduling and completing works that results in numerous issues like delay in providing facilities, development, cutback in quality of construction and making the project more expensive.
- Aftab Hameed Memon and Ismail Abdul Rahman (2014) suggested that time is the biggest element that every contractor has to deal with while practicing the construction activities.
- E. Suresh Kumar and S. Krishnamoorthi (2015) In their study they focused on the scheduling using MSP and earns value analysis for an apartment building.
- Hoang, Nhat Minh Shrestha, Swastik (2014) hinted that the main function of a software is to offer help, and enhance the quality of output with less effort than manual ways.
- J. Jayalakshmi (2014), This study compared time performance of the conventional method of construction for high- rise residential and Industrial Building System (IBS) method by overall construction period.
- Minh Shrestha, hinted that the main function of a software is help, and develop the quality of output with less effort than manual ways.
- Nikhil R. Mahajan and M. V. Bhogone (2017) The methodology adapted by them was to compare Microsoft Project and Traditional Method