

# Planning, Scheduling & Resource Allocation Analysis of a Residential Project using Primavera P6

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## ABSTRACT

In this study, I am comparing a working project with a previously completed project of same aspect, for this research work we have chosen Residential project, Bhopal. Which is on the verge of execution. For planning, scheduling and resource allocation we are using project management tool Primavera P6 8.3. From the study, it is found, how the project is planned, the sequence of work and linking relationships between activities for the whole project. In conclusion it is understood that, it is important to realize that there will be changes to the schedule logic as well as differences between the planned progress and actual progress. Based on the differences the schedule needs to be changed so as to complete the project smoothly.

Keywords : Primavera, Gantt Chart, Time-Cost Comparison, CPM Network, Tracking, Project Scheduling.

## I. INTRODUCTION

A construction project mission is to create a desired facility like a housing complex or a fertilizer plant with predetermined performance objectives defined in terms of quality specifications, completion time, budgeted costs and other specified constraints. It is not a routine activity like the regular maintenance of building or roads. Management of a construction project mission entails the multi directional interaction of dynamic forces represented by its scope, time, resources, costs and quality. There is a dynamic link on how to manage scope, resources, product quality and how to stay within time and budget limits. The metrics of project are given in Figure 1.1.



Fig 1.1 PROJECT MATRICS

The works carried out in any organization can be divided into two categories i.e. new unique endeavor and routine operations. The completion time for a unique endeavor can vary from a few hours to many years, and the cost can range from low to very high. A project is a new unique effort undertaken to achieve specified objectives. 'New' implies that it is different from the management of routine operations, 'unique' means that it is not done before (at the same location and with the same resources) and it is subjected to risks and uncertainties. Transient endeavor implies

that it is a temporary organisation created to attain certain objectives of completion time, budgeted costs and development specifications.

The management can be defined as the art and the science of preparing, organising and directing human efforts to control the forces and utilise the materials of nature for the benefit of human race. Project management aims to achieve the stated goals of the project leading to completed facility, by virtue of planning, executing, and controlling time, funds and human and technical resources. The planning essentially consists of setting objective, identifying resources and forming strategy. Execution consists of allocation of resources, guiding execution, coordinating efforts and motivating the staff. Controlling consists of measuring achievement goals, reporting, and resolving problems. The planning, executing and controlling are performed on a continuous basis till the goals of the project are realized.

## PRIMAVERA P6

Oracle's Primavera P6 is one of the most powerful and comprehensive project management tools available on the market today. Simply put, Primavera is a project management software specifically designed to help manage complex projects. Its role-specific functionality helps organize projects in a way that satisfies each team member's needs, responsibilities, and skills.

Primavera P6 is not a single product, but a suite of products that helps manage a project over its entire lifecycle. You can use it to help manage risk versus reward, resourcing, and budget, among many other deliverables. With Primavera, organizations can be able to better execute amid economic uncertainty, respond quickly to unexpected changes, and create value for their organizations and stakeholders.

## II. Literature Review

**Bagade et. al. (2018)** [1] Explored that Planning, booking and Resource leveling assumes an imperative part in any development venture perhaps it is development of building or development of street. Without appropriate arranging, booking and asset leveling development industry does not get benefit over the venture. For this reason, legitimate programming's and methods must be use. This paper is focussing on the benefits of Oracle Primavera P6 Software. The most recent rendition of Primavera is P6-17. In any development work tremendous measure of printed material is required, which makes the administration extremely oppressive. By utilizing Oracle's Primavera P6 Software printed material can be decrease, bringing about diminishment of weight. Primavera P6 give change in development administration. Primavera P6 is the time redeemable device, with legitimate asset enhancement.

**Ghadge et. al. (2017)** [2] Project cost is the one of the governing factor in project success. Project management is used to increase productivity in terms of human resource and materials. Earned value management (EVM) is a project performance evaluation technique which has been adapted for application in project management. The technique helps in comparison of budgeted cost of work to actual cost. The present study deals with the review of the project management involving earned value analysis.

**Nimbal et. al. (2017)** [3] Considered that owing to an expanding setting of condition, Construction industry is ever forthright for the improvement and headway in instruments and gear highlights, apparatuses of correspondence, systems of effective administration, instructing the HR about it. This exceptional specialization requires profoundly engaged whose development was intended to begin at Pune, Maharashtra, India. Undertaking Planning and Controlling devices or systems. In the present investigation we actualized the PC based Project

Management programming/apparatus Primavera P6 for the Planning, Scheduling and Allocation of assets for a (G+8) private condo building It knows the likeness between the arranged the arranged advance of development work and real advance of the performed work. In this way the centrality and the benefits of utilizing Primavera will be sketched out through the information comes about acquired. The acknowledgment of the product Primavera as a stage of booking is been on a blast in Multi National Construction Companies, yet because of obliviousness and absence of Project Management ideas and demoralize towards the utilization of PC based projects, little and medium scale Indian development organizations go up against different issues, for example, wasteful arranging, venture delays, wastefulness of assets and numerous different issues. In this way, we likewise endeavor to teach one such medium scale development organization about the upsides of Primavera in execution of any development extends proficiently.

**R. Kohli (2017)** [4] Reasoned that Efficient task administration is the need of great importance and it is the sole duty of the undertaking director to guarantee the working of the venture as indicated by its dispensed spending plan and due dates. For any development venture, legitimate arranging, booking, compelling asset allotment and refreshing the exercises is to a great degree basic to improve the task and build up most extreme spending augmentation. Dishonorable planning, sporadic checking and poor treatment of the continuous exercises builds the venture term and sum with a significant edge. Subsequently, it is fundamental to embrace expansive scale administration extends effectively with the assistance of PC helped programming. The essential target of this paper is to comprehend the standards of arranging, booking, asset assignment and leveling alongside proficient undertaking administration of a development building. The well ordered strategy to embrace an undertaking has been clarified and a

definitive use of Primavera P6 Enterprise Project Portfolio Management (EPPM) has been condensed.

**P.M. WALE et. al. (2015)** [5] expressed that the undertaking may have a straightforward objectives that does not require numerous individuals or a lot of cash or it might be very perplexing, calling for different abilities and plenty of assets and furthermore gave similar examination between customary way and Microsoft venture arranging. They reasoned that Traditional route ends up being uneconomical and expends additional time with numerous complexity and gigantic mistake while Microsoft Project is the cutting edge apparatus of Project Management that guide to conquer the hindrances confronted attributable to conventional method for Planning and Management.

**A.R. NIKUMBH et. al. (2014)** [6] suggested that the utilization of Project Management Consultancy (PMC) offers one of the compelling administration answer for increment and enhance the productivity and result of an undertaking in development and reasoned that the Project Management Consultants deal with the Project by use of their Knowledge, Skills, and Experience at different stages and is powerful and effective just when it is associated with Total Project Life Cycle from Conception to Closeout.

#### Objectives:

1. To compare the scheduling of a running project with completed project in past of same aspect.
2. To identify scheduling technique used in developing planning and scheduling.
3. To develop scheduling and resource allocation using Primavera p6 8.3 software.
4. To provide proper management and scheduling for a live project to complete it within the provided time limit.
5. To provide resources requirement as per I.S. 7272 as per quantity of work.

Table 1: Project Information

<b>Name of work</b>	Construction of Commercial building
<b>Salient Features</b>	Power backup for machineries & common areas, assembled with bolted connections

<b>Name of Agency</b>	<b>Fortune Group</b>
<b>LAND</b>	<b>16500 sq. ft. (100 x 165)</b>
<b>Amount of contract</b>	<b>1,70,00,000 Rs</b>
<b>Date of start</b>	<b>01-05-2019</b>
<b>No. of column</b>	<b>68</b>
<b>No. of beams</b>	<b>208</b>
<b>Project Incharge</b>	<b>Mr. G.C. Shrivastava</b>

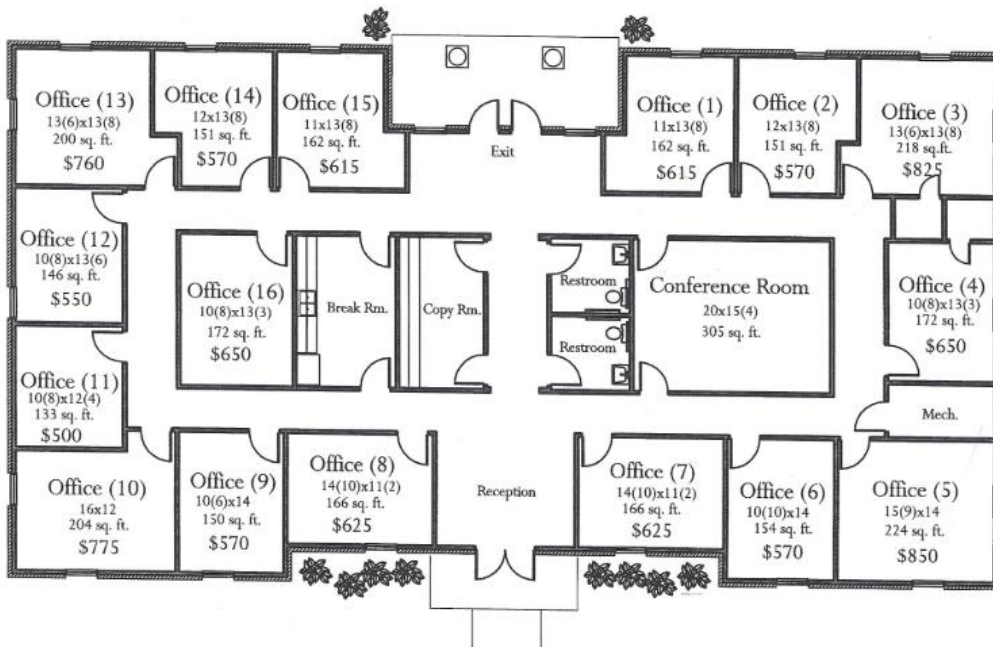


Fig 2 : Plan of project work

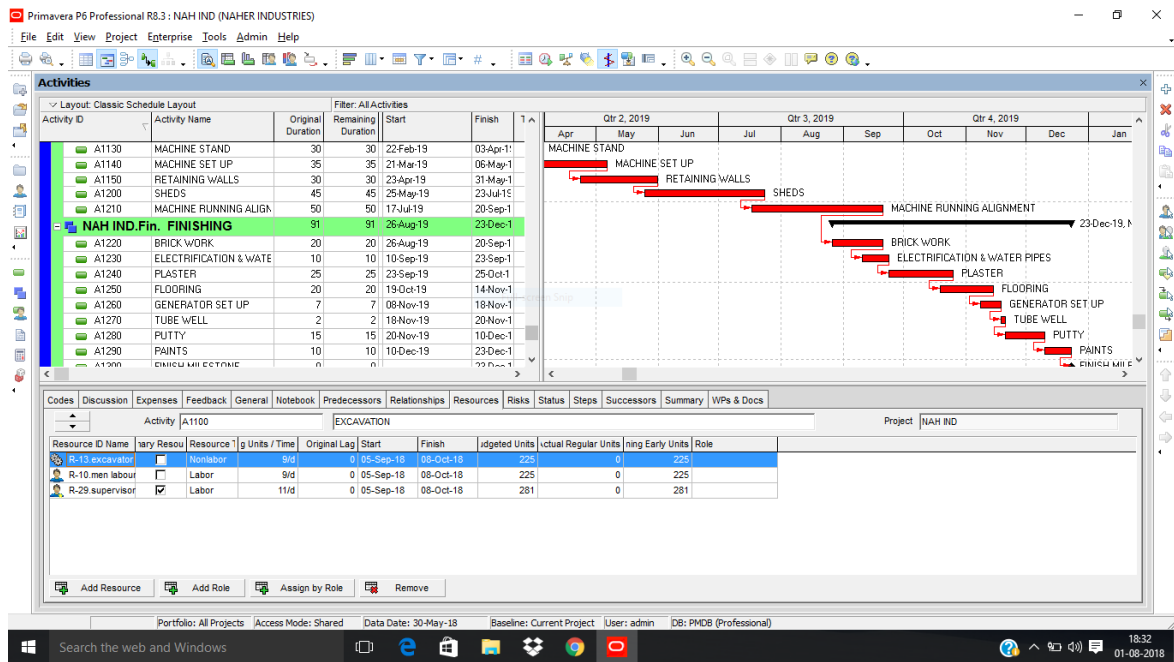
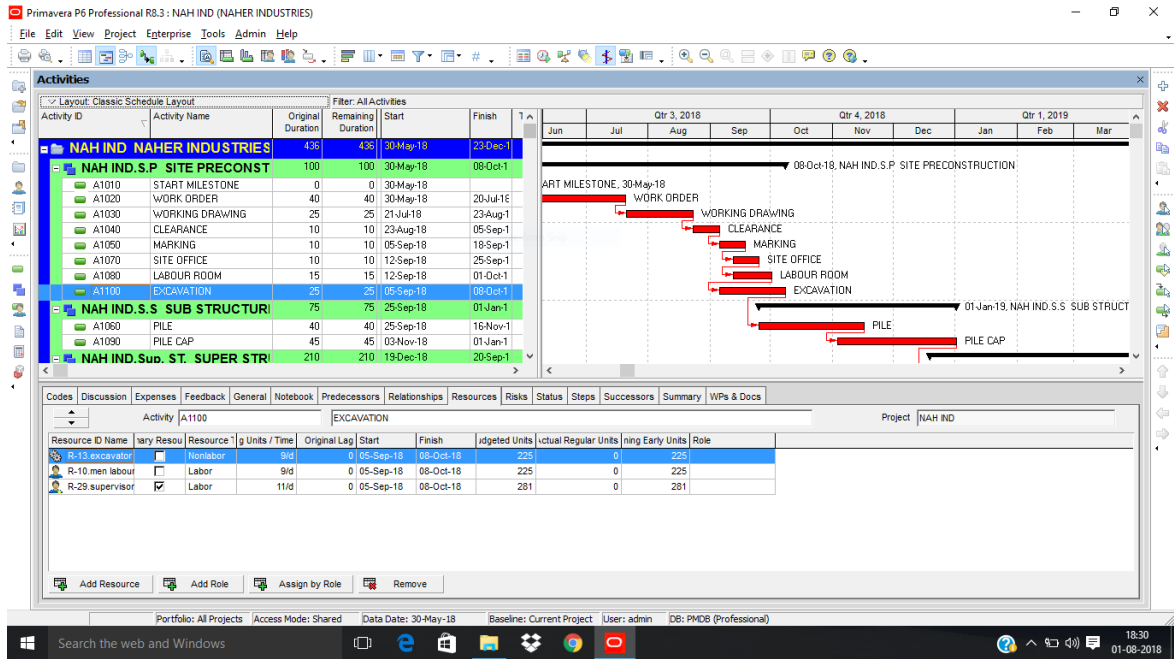
### III. RESULTS AND DISCUSSION

#### Resource Allocation:

S.NO	ACTIVITY	QUANTITY	UNIT	LABOUR COEFF AS PER I.S. 7272 PART-1					PROPOSED LABOUR REQ. FOR UPCOMING BLOCKS PER DAY					DURATION FOR COMPLETION(DAYS)		
				MASON	MAZDOOR	MATE/VIBRATOR	BAR BINDER	CARPENTER	MASON	MAZDOOR	MATE/VIBRATOR	BAR BINDER	CARPENTER	total cost of resources per day	resource cost for an activity	
1	Clearance															
2	Marking															
3	Site Office	97.53	m3	0.08	0.12	0.1	0	0	2	3	2.5	0	0	2.4	2679.5	6430.8
4	Labour Room	2875.76	m3	0.08	0.12	0.1	0	0	2	3	2.5	0	0	2.4	2685	6444
5	Excavation	1243.56	m3	0.08	0.12	0.1	0	0	2	3	2.5	0	0	2.4	2690.5	6457.2
6	Pile	5467.98	m3													
7	Pile cap	28161.65	Kg	0	0.01	0	0.01	0	0	6	0	4	0	11	3714	40854
8	column	502.656	m2	0	0.2	0	0	0.25	0	2.3	0	0	3.5	6	2279.2	13675.2
9	Base	356.25	m3	0.17	2	0.07	0	0	1.8	15	2.06	0	0	6.5	6395.74	41572.31
10	Machine Stand	502.656	m2	0	0.05	0	0	0.06	0	2.5	0	0	3	5.2	2127.5	11063
11	Machine Set up														0	
12	Retaining Wall	53.18	m3	0.08	0.12	0.1	0	0	2	3.01	2.5	0	0	1.5	2682.79	4024.185
13	Sheds	17006.8	Kg	0	0.01	0	0.01	0	0	3.5	0	4	0	5.6	2891.5	16192.4
14	chine Running Allignm	236.352	m2		0.2			0.25		2.1		4		4.5	2430.9	10939.05
15	Brick work	295.44	m3	0.17	2	0.07	0	0	5	12	1.5	0	0	5.1	6616.5	33744.15
16	Electrical & water pipes	236.352	m2		0.05	0	0	0.06	0	3	0	0	2	1.5	1857	2785.5
17	Plaster	3452.6													0	0
18	Flooring	36512.62	Kg	0	0.01	0	0.01	0	0	8	0	11	0	3.5	7417	25959.5
19	Generator Set Up	1310.4	m2		0.2			0.25		5		0	10	4.5	5995	26977.5
20	Tubewell	176.4	m3	0.23	3.5	0.1			6	20	2.6			3.5	10045.4	35158.9
21	putty	1310.4	m2	0	0.05			0.06		2.1			4	3.5	2430.9	8508.15
																96604.1

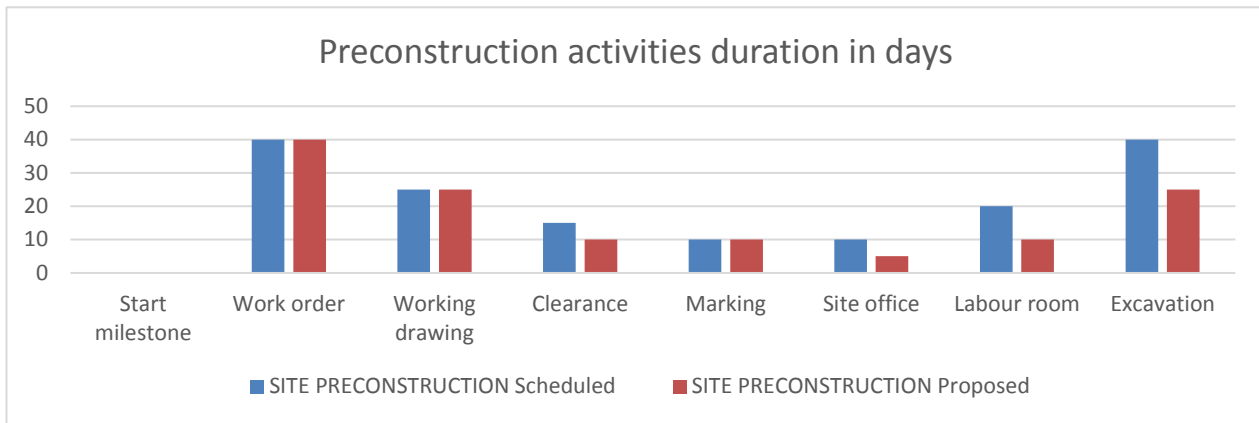
Fig 3 : Resource allocation

Project Scheduling:



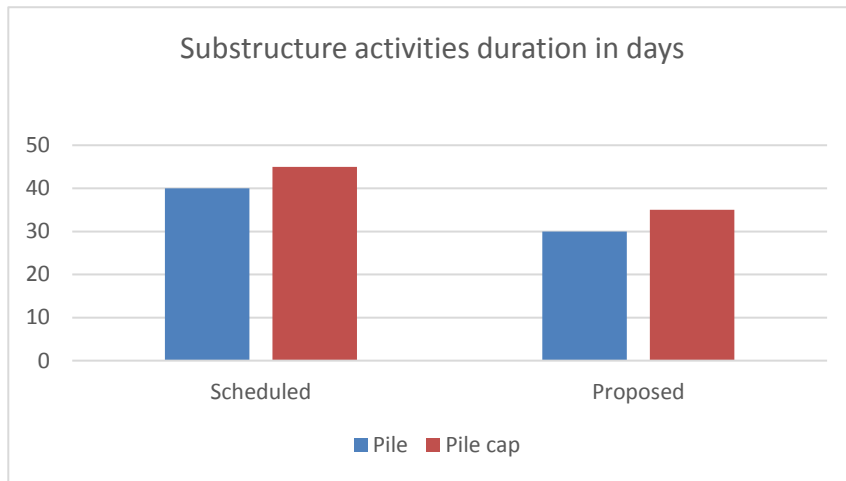
**Activities in W.B.S.:**

**Preconstruction Work Comparison:**



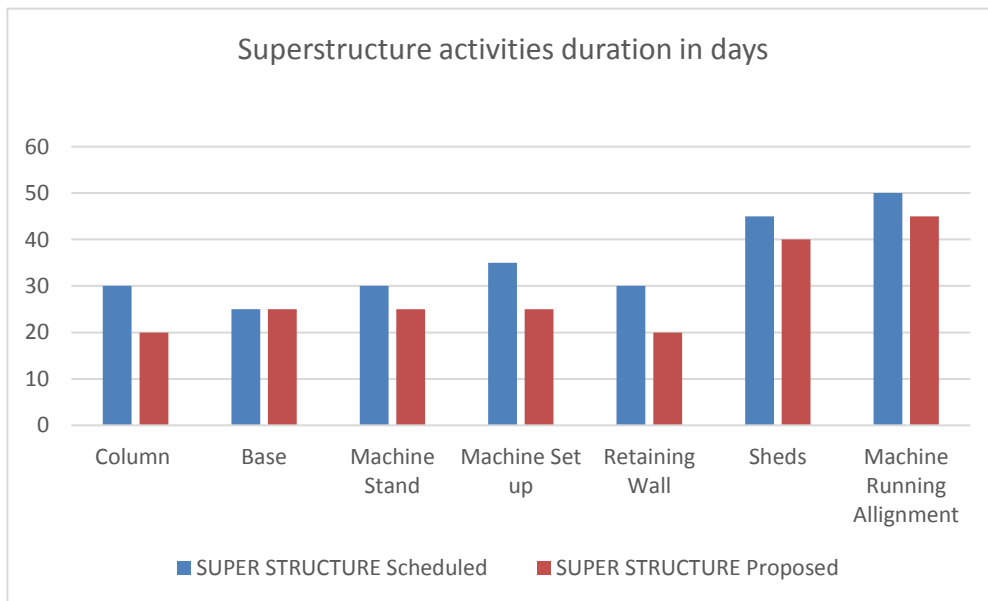
**Fig 5: Activities comparison in preconstruction**

**Substructure:**



**Fig 6: Substructure work**

**Superstructure Work:**



**Fig 7: Superstructure work**

Finishing Work:

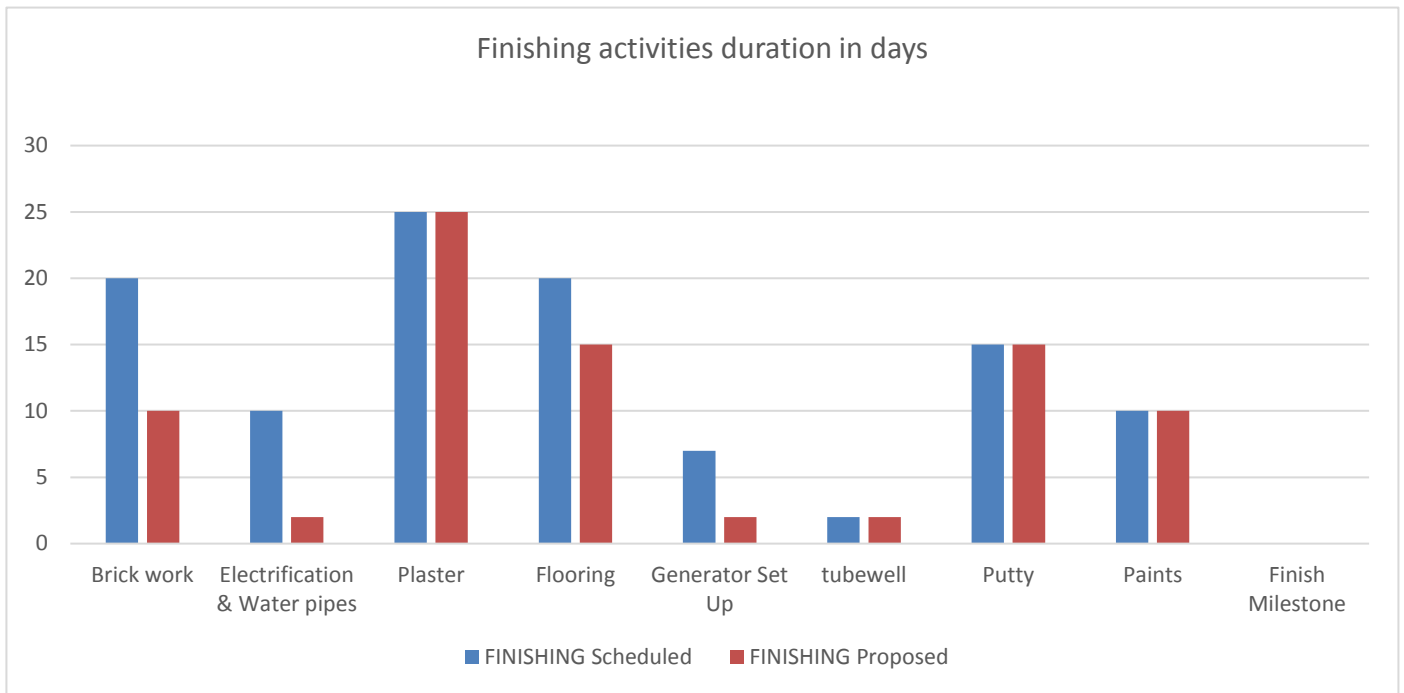


Fig 8: Finishing work

IV.CONCLUSION

By Observing the Results, this can be Concluded that the Comparative investigation between various W.B.S w.r.t Time and Resource cost for a proposed venture plan is discovered generally Economical. This can be comprehend by watching the general span really devoured in finishing the past venture ie. 564 days with the proposed plan arranged which demonstrates the fruition in 436 days. This show sparing of 128 days and so sparing of immense Indirect cost ie. Equivalent to Rs 8,73,000. The intelligent grouping of exercises with requirements were resolved and allotted based on work included and past experience. In view of information got, arrange graph is readied and relations are appointed to exercises to figure basic way. The span of task were characterized at various level like sub venture level, work bundle level, action level, activities level. In development venture, the time length is for the most part identified with the quantum of asset utilized. The product additionally assist us with calculating the span required to finish the task as per the arranged timetable and genuine

execution of movement whenever and it gives the thought regarding venture is on plan, in front of calendar, behind the calendar. The labor plan is readied which gives an unmistakable picture of work necessity in correct number amid the execution time of the undertaking.

Consequently Project arranged alongside Resource allotment for Upcoming task is more appropriate than past genuine arrangement which was actualized.

Likewise, It can be presumed that :-

- (1) This venture plan comprise of Pre-Actions to neutralize Past disappointments emitted because of feeble administration and past Time-Cost relations.
- (2) The asset designation is done on IS-7272 which give least yield of work at building site. This thought of least yield will likewise help in more cost decrease in every action making constructive outcome on Economy.

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