

# Construction Management of Commercial and Residential Building Using Primavera P6

Palak Patel<sup>1</sup>, J.D.Raol<sup>2</sup>

<sup>1</sup>PG Student, Department of Civil Engineering, LDRP institute of Technology and Research, Gandhinagar, Gujrat-382015

<sup>2</sup>Professor, Department of Civil Engineering, LDRP institute of Technology and Research, Gandhinagar, Gujrat-382015

**Abstract-** Although the long Construction industry has promised to solve and improve the current construction method and scenario in our country. In lieu with such scenario, this study conducted to quantify evidence of time and cost saving in Construction Project. Primavera is an amazing project management software tool which is not just used by project managers. Designed to make managing large or complex projects, Primavera is the ideal tool for anyone who is involved in planning, monitoring and reporting on the progress of any big task, development or venture. This study measures the fluctuation in material productivity by collecting data regarding productivity of the Site using Primavera Software. Basically two different sites named New “B” Category Multi-storey Two Tower and Prestige Fintech are selected for data Collection. Above all data is entered in the Software named Primavera P6 15.2. Earned Value Analysis method is used to calculate the Material Productivity at the jobsite, and Software generates graphical representation itself. The main aim of this study is to manage and maintain the timely flow of materials to the jobsite, and thus facilitate improved work face planning, increased labour productivity, better schedules, and lower project costs using Primavera Software.

**Index Terms-** Construction Management, Building, Material Productivity, Primavera.

## INTRODUCTION

Construction industry is an integral component of a nation’s infrastructure and industrial growth. Even though construction industry is the second largest industry in India, the growth of this industry has been differential across the nation. The rural regions need tools for economic development, land use and environment planning to cope with the status of

development in urban areas. The time available to achieve this goal is shrinking.

Here arises the need for effective project management. Many issues are being faced by construction industry that must be taken care of. They include time and cost overruns due to inadequate project formulation, poor planning for implementation, lack of proper contract planning and management and lack of proper management during execution. Observations show that proper skilful management is imperative for the timely completion of the project within estimated budget and with allocated resources. Projects with good planning, adequate organizational machinery and sufficient flow of resources cannot automatically achieve the desired result. There must be some warning mechanism, which can alert the organization about its possible success and failures, off and on. Project monitoring is the process of collecting, recording, and reporting information concerning project performance that project manager and others wish to know. \Monitoring involves watching the progress of the project against time, resources and performance schedule during execution of the project and identifying lagging areas requiring timely attention and action whereas project controlling uses data from monitor activity to bring actual performance to planned performance.<sup>[2]</sup>

Construction projects cost is mainly depending on

- Materials,
- Manpower,
- Machinery.

## MATERIAL MANAGEMENT

Construction material constitutes a major cost component in any construction project. The total cost of installed material may be 50% or more of the total cost. The goal of material management is to ensure that the materials are available at their point of use when needed hence, efficient procurement of material represents a key role in the successful completion of the work. Materials management is a critical component of the construction industry.

“Material management is defined as the process to provide right material at right place at right time in right quantity so as to minimize the cost of project”. Material management is concerned with the planning, identification, procuring, storage, receiving and distribution of material.

The responsibility of Material management department for the flow of material from the time the material is ordered, received, and stored until they are used is the basic responsibility of material management. Materials represent a major expense in construction, so minimizing procurement cost improves opportunities for reducing the overall project cost.<sup>[3]</sup>

#### ABOUT PRIMAVERA SOFTWARE

Project Management software (P6) is a powerful, interlinked software system designed to create and analyze the CPM schedules used in managing construction projects; which allows linking multiple schedules together. Primavera is the industry leading project and program management solution for projects of any size.

Construction Company’s project monitoring and controlling is very essential process to complete the work in time. But in most of cases work will not running as per plan. Primavera is the software introduced for proper monitoring. Earned value analysis is the tool to check the project progress in time and helps in taking better decision.

The present project work aim is to cost controlling and optimization by earned value analysis for a residential apartment. The planned value cost and earned value cost difference shows the cost overrun. Primavera software can be used in the all over India; it is powerful software to identify the problems and resolving methods. The utilization of software can be helps to proper running of project work.<sup>[1]</sup>

#### OBJECTIVE OF THE STUDY

This study is conducted for archiving following objectives:

- To find out the lack in supply of material at site.
- To ensure effective progress of work.
- For improving the Material Productivity.
- To analyse the existing system for managing the materials.
- To increase the better material management on the site.

#### SITE DETAILS

Project Details of Site-1

Project: Construction of New “B” Category Multistory Two Tower at Vastrapur

Govt. Colony Ahmedabad

Client: The Executive Engineer (City Division) R&B Division

Project Location: Vastrapur Govt. Colony, Ahmedabad

Project Cost : Rs. 21, 24,97,150.44

Contractor: M/S. Katira Construction Ltd. Bhuj

Time Limit: 15 Months

Physical progress at Site: Rs. 4,95,00,000.00

Financial Progress: Rs. 04,54,00,000.00

Floor: G+7

Project Details of Site-2

Project: Prestige Fintech

Client: Prestige Ltd.

Project Location: 53-C, Gift City, Gandhinagar.

Project Cost: Rs. 52 Cr

Contractor: PSP Projects Ltd.

Time Limit: 1.5 Years

Financial Progress: Rs. 10 Cr

Floors: -2+G+20

#### COST ANALYSIS

##### Site-1

Total Cost: 21 Cr.

Per Floor Cost (Approx.): 2.65 Cr.

Work Done Cost till 31-12-2017: 10 Cr.

Duration: 9 Month

For, material management: Ms Project 2015

As per Data Given by Site Engineer Cost of Material is mentioned in the table:

	Total Qty(cum)	Price(Cr.)
Steel	739.7	50299600
Cement	1194.62	6450948
Sand	1936.56	5809680
Total		62560228.0

Table.1: Material Cost of Site-1

Site-2

Total Cost: 52 Cr.

Per Floor Cost: 2.25 Cr.

Work Done Cost up to now: 14 Cr.

Duration: 13 Month

Particular 1 Month Work Done Cost: 1 Cr.

As per Data Given by Site Engineer Cost of Material is mentioned in the table:

	Total Qty(cum)	Price(Cr.)
Steel	1142.406	77683608
Cement	3009.32	16250328
Sand	2262.96	6788880
Total		100722816.0

Table.2: Material Cost of Site-2

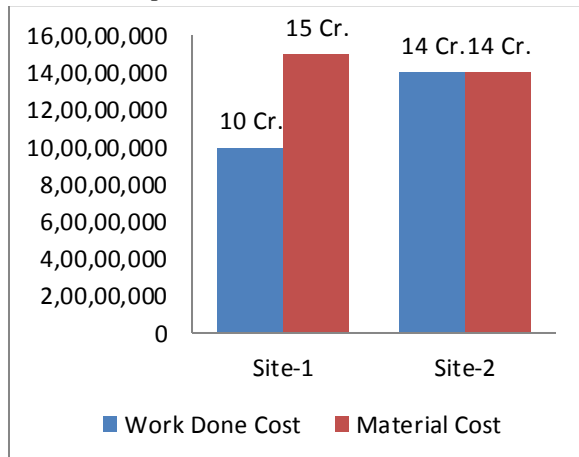


Fig.1 Area Divided in 2 Part

COMPARISON BETWEEN SITE-1 AND SITE-2

	Site-1	Site-2
Work Done Cost	1000,00,000	1400,00,000
Material Cost	1500,00,000	1400,00,000

Table.3: Comparison between Site-1 and Site-2



After analysing the data Collection for both the Site, this shows that in next 1 month the major activities on site may not be in ideal conditions. So, for that the Pre-planning Schedule for 1 month including the resource loading given to Site-2 using Primavera Software.

For Site-1, the data given by the Management is used to Cross Check the Pre-planning work done by the planning department in MS Project. For Cross checking the Pre-planning work Primavera Software is used.

MANAGEMENT AT SITE 2

For Proper Management at Site-2 and for reducing the Time required completing the one floor in minimum time the whole project area is divided in 2 parts as shown in fig below:

STEPS IN PRIMA VERA SOFTWARE

Step 1: Creating a WBS:

The Project work is identifying into small work packages depending upon their merits is assigned in project.

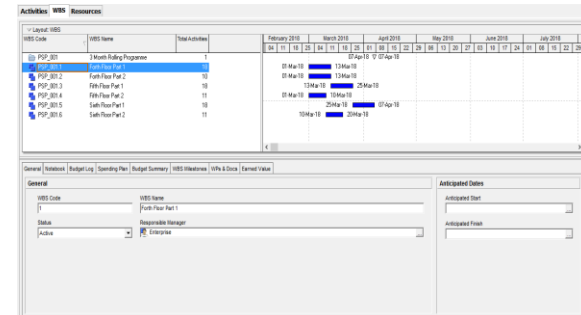


Fig.2 Creating a WBS

Step 2: Adding Activities: WBS is divided into the Activities. Activities are the primary work elements of project.

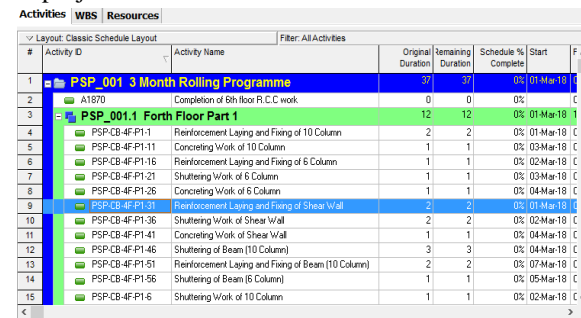


Fig.3 Adding Activities

Step 3: Assigning Activity logic Relationships:

- Adding the "Relationships "tab.
- Assigning to add Predecessors / Successors.
- Selecting the Predecessor /Successor from the list.

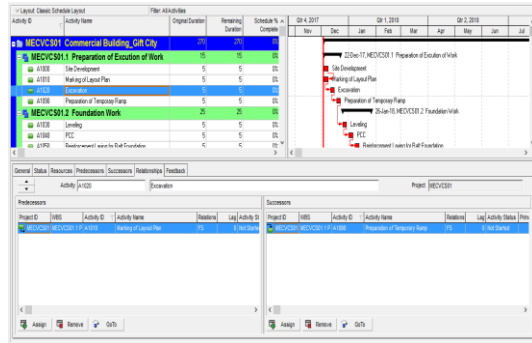


Fig.4 Assigning Activity logic Relationships  
Step 4: Assigning Resources:

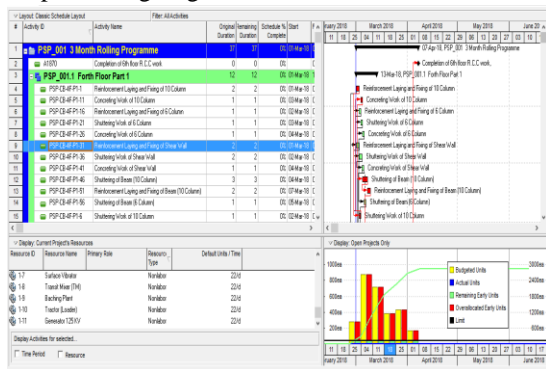
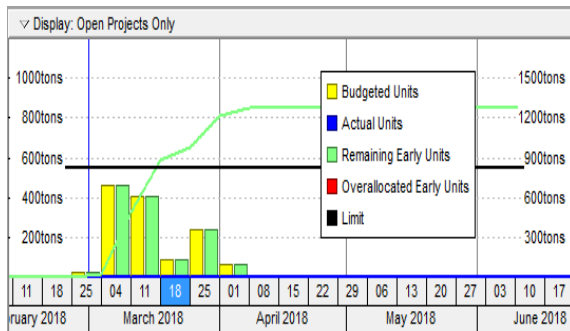


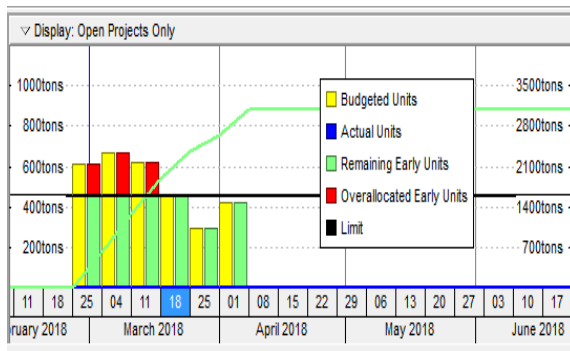
Fig.5 Assigning Resources

RESOURCE USAGE PROFILE

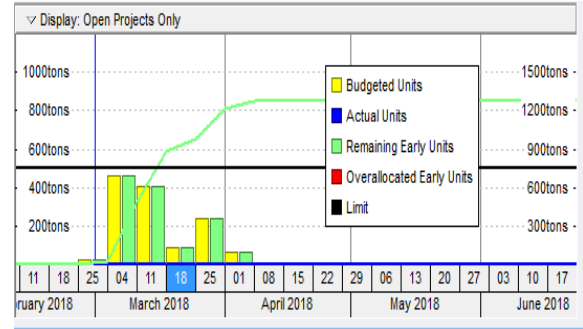
Cement



Steel



Sand



CONCLUSION

As discussion with Project Manager and Planning Department, their goal is to cast 3 Slabs in 1 Month. So, after analyse for consumption of material and work front availability, 1 Month Rolling Programme given to the project manager of PSP to achieve 3 floor slab casting.

	Material Purchased by Company per month (tone)	Material Required as per Primavera P6
Steel	303	2761
Cement	686	1210
Sand	120	1210

Table.4: Comparison of Material

As this table shows that, to achieve the planned programme the quantity of material required as per primavera p6 is more than 90% of present quantity of steel on site, 43% of present quantity of cement on site and 90% of present quantity of sand on site. So, as looked into the material stock per month is very less the material required on site based on work front availability.

As site 2 have enough work front availability but due to less material stock in store, the work done value per month is not achieved as per pre-planning.

After analyse the data and different parameters (long lead items, temperature, weather, site conditions, qualification of staff, natural hazards, storage capacity of store, material management, etc.). The main reason for not achieving the planned work due to lack of material management.

So, as an outcome of study, 1 month look ahead programme is given for executing the work. In 1 month look ahead programmes, the quantity of work in each activity is taken after analyse the design and drawings, labour productivity, public holidays and site conditions.

So, if work is executed on time as per look ahead programme the work done cost after 1 month increased up to 85% compare to existing.

#### ACKNOWLEDGMENT

Apart from the efforts of me, the success of any project depends largely on the encouragement and guidelines of many others. I take this opportunity to express my gratitude to the people who have been instrumental in the successful completion of this project. I wish to express my deep sense of gratitude to my guide, Mr. J.D.Raol for their able guidance and useful suggestions. Words are inadequate in offering my thanks to the Mr. Kuldip Brahmhatt for their encouragement and corporation in carried out the project work. Finally, yet importantly, I would like to express heartfelt thanks to my beloved parents for their blessings, my friends for their help and wishes for the project.

#### REFERENCES

- [1] Base Line Fixing and Earned Value Analysis in Construction Industry using Primavera by Suhas K B, Prof Vijay K, International Journal of Engineering Research & Technology, Vol. 5 Issue 08, August-2016.
- [2] Project Monitoring and Control using Primavera by Andrew Fernans Tom, Sachin Paul, International Journal of Innovative Research in Science, Engineering and Technology, Vol. 2, Issue 3, March 2013.
- [3] 3. Study of Material Management Techniques on Construction Project by Aditya A. Pande, S .Sabihuddin, International Journal of Informative & Futuristic Research, Volume 2, Issue 9, May 2015.