

# Monitoring & Scheduling of A Metro Project (Bhopal) Work Using Project Management Tool Primavera P6

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## ABSTRACT

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Arranging and Scheduling are the fundamental in the enormous foundation project like street and extension development, Metro rail projects as these are proposed for public government assistance. These activities are have various partners and enormous measure of cash, assets are contributed. Ill-advised arranging and booking prompts loss of assets, expansion in project cost and terrible postponements. Yet, because of the PC and programming advancement, it now conceivable to design these tasks utilizing programming resembles Primavera P6 and Microsoft office project.

This paper manages show of metro rail project in Bhopal contrasting the two distinct stages in measure as Phase I - Subhash Nagar Phatak to Sargam Talkis and Phase II – Sargam Talkis to Saket Nagar. The task outlined expressed the benefit and added advantages of Web based primavera P6 for arranging and booking of Bhopal Metro Rail Project outlining the issues and inconveniences looked in the time span of development and accessibility of assets.

**Keywords :** Primavera P6 Web, Bhopal Metro, Planning, Scheduling, Monitoring and Tracking

## I. INTRODUCTION

Venture burns-through a few assets in the course of its life to accomplish the ideal objective. The assets have time reliant, immediate or aberrant costs identified with them. For huge Construction projects with tremendous spending plan; it turns out to be hard for the venture group to deal with the assignments So, it turns out to be important to give an apparatus in the hand of undertaking group that helps monitor exercises in the task. Primavera Project

Planner P6, an item from Oracle is an extremely amazing asset present in the possession of task group. The product helps in arranging, planning and controlling of tasks effectively. Workers for hire in India are hesitant to utilize project arranging and planning methods, which are being utilized world over and right now demonstrated as benchmark for in time consummation of ventures. The investigation incorporates with conversation/presentation on Primavera P6 a venture arranging and planning instrument accessible. The nature of timetable produced from the product regularly needs detail and

the motivation behind the product in increasing the value of the task is for the most part not met by the clients in India.

Monetary vulnerabilities lead to spontaneous construction misfortune in any immense task. Such misfortunes can be guaranteed because of surpassing the dead line of the undertakings, or now and again because of total administration and might be a catastrophic event like avalanche or tremor of flood or any man made dangers specifically burglary, theft or quake because of mining.

The venture is thinking about monetary administration, stock administration and human asset the executives utilizing the application "Primavera P6 V 8.3". The application can help the administration through Gantt Chart and functionalities in a near investigation of the proposed cutoff times and the reasonable execution.



Fig 1 Project management Stages

**Objectives**

- ✓ To foster booking and arranging utilizing Primavera P6 V8.3 for Bhopal Metro Project.

- ✓ To plan development grouping and relative examination in the middle of two courses and recognizable proof of reasons in delay.
- ✓ Conducting Financial Risk investigation utilizing Primavera P6.
- ✓ Financial Risk examination utilizing gantt outline in Primavera P6.
- ✓ To appoint legitimate arrangement and connections between various exercises for early completion.

**II. Literature Survey**

**Mohammad Afzal S. Siddiqui and Abhijit N. Bhirud (2018)** the research paper listed the activities of Pune metro rail bridge work for a 10km stretch of bridge work and highlights the enterprise project structure, organizational breakdown structure, the work breakdown structure and its activities and thus highlight the impact of Primavera P6 in the planning of projects of greater magnitude.

The results stated that the route from the Pimpri chinchwad to the Range hill section was planned in Primavera in the research paper which was based on tentative times of activities depending upon their working times required for each activity to finish. This is an estimated time required to complete the project not considering the other major causes of delay which can include political obstacles, non-cooperation of other departments on site utility obstacles etc. The research demonstrated the planning for a stretch of 10.8 km of metro rail bridge from the PCMC to range hills up to the substructure level activities. The various practices of getting formalities done for superstructure works have also being taken into account. This scheduling has future scope of updating and monitoring the scheduled work.

**R.Santhosh Kumar and Anoop James Antony (2018)** the primary objective of the research was to complete the construction project as indicated time period with

specified date and proper usage of funding and number of resources. To accomplish the project successfully, the objective included preplanning and scheduling the activities of a project for acquiring budgeted cost, adopt the proper activity sequencing by assigning proper relationship between activities, identifying the activities which could be start parallel so that the duration could be reduced, allocate the resources effectively for usage of available equipment's and material's. With all projects are in a centralized database, the robust security module protects project data and offers flexibility when determining who can access each project. CPM Scheduling provides Critical Path Method (CPM) Scheduling, which uses the activity durations, relationships between activities and calendars to calculate a schedule for the project. CPM identifies the critical path of activities, those activities that affect the completion date for the project or an intermediate deadline, and if delayed will delay the finish of the project.

Conclusion derived from the results stated that the preplanning and scheduling by using Primavera P6 helps in understanding the variation original schedule and the pre-planned schedule. This help the project managers to identify the critical activity plan accordingly while executing the project. The current construction practice in our country is still adopting the policy of as and when required in managing the resource of project. This policy of management may cause a huge impact in achieving the budgeted expenses and the actual expenses. Hence using construction management software in the vast and complex projects reduce the uncertainty and achieve a better result.

### III. METHODS AND MATERIAL

Table 1: Description

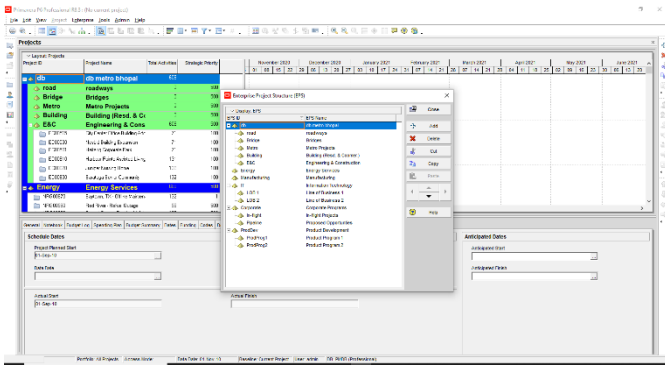
Name of Work	Bhopal Metro Rail Project
Name of Agency	Dilip Buildicon Pvt Ltd
Amount of Contract	6,941 Cr.
Date of Start	2013
Tentative Date of Competition	2023
Length of Metro Rail Line	105 Kms

Table 2: Methodology

<b>Survey Site Investigation</b>
Soil Testing
Boring of Strata
Site Office
Machinery Setup
Labour and Material Setup
<b>Substructure</b>
Excavation
PCC
Foundation
Abulment
<b>Super Structure</b>
Pier
Bearing Plate
Girder
Deck
Railway Line

Step 1- To create enterprise project of a company to execute company profile.

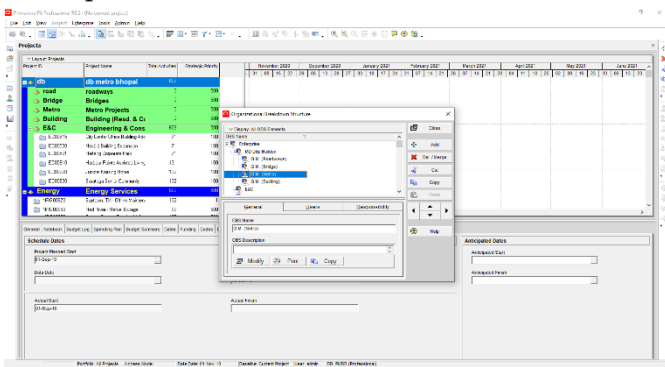
In this step, creation of the company profile with division in which company operates was prepared. These divisions were further subdivided into streams such as road and bridges.



**Fig 2 Project Structure**

Step 2- Assigning roles and organization structure constituting of company management and responsible managers profile.

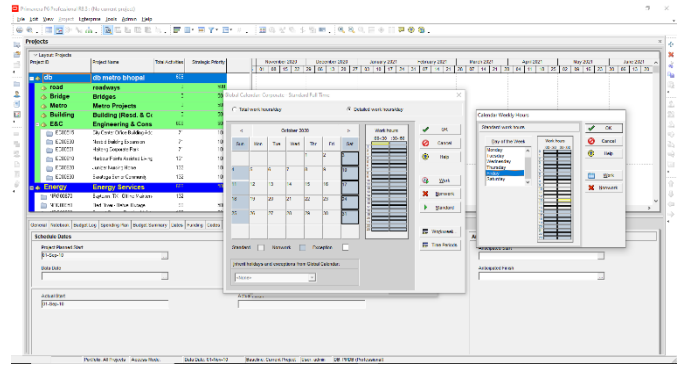
The job roles are assigned one the expertise of the employee and the task are assigned as per their qualifications and their experience in the similar tasks as efficient resources are responsible for completion of any project in right intervals and are important for development ventures.



**Fig 3 Assigning Job Roles**

Step 3- Creating working calendar as per working hours and shifts to be assigned in project:

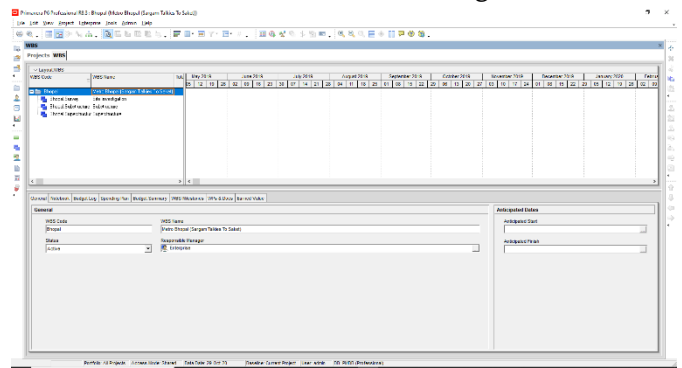
Before the start of project, the activity list is entered and the calendar are characterized and utilized to display the working time for every action in the task. Calendars are additionally used to characterize the working and occurrence design over the length of the task. These are three unique kinds of schedules namely Global, Venture and customized. The working shift is considered as 8 hours and six days working. The point to point working hours are from 08:00 AM to 05:00 PM. Meal break is of an hour from 12:00 PM to 01:00 PM.



**Fig 4 Global Calendar**

Step 4- Preparing Work Breakdown Structure

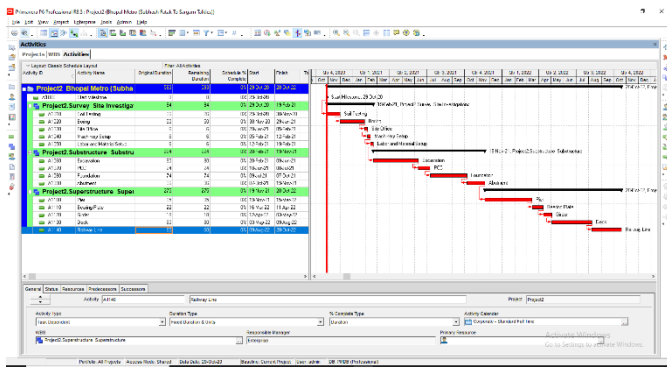
A WBS is the progression of work used to achieve the project to finish a task. WBS is organized in levels work point by point starting with final task and latter formation of different forms into identifiable work components. WBS is based on the individual sub venture and the undertaken WBS is figured beneath:



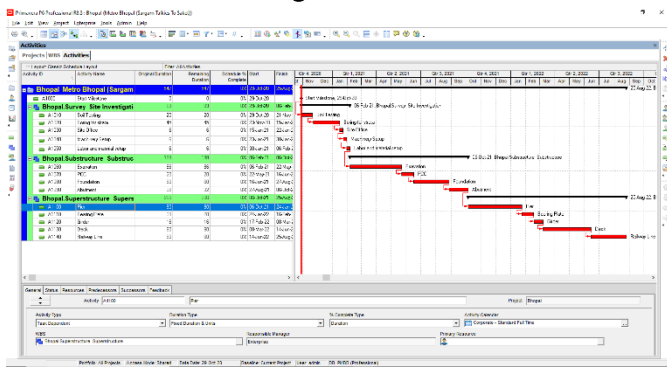
**Fig 5 WBS Structure**

Step 5- Assigning activities of each WBS as per scheduling data with links in between activities using Gantt chart.

Critical advance in the undertaking arranging is to distinguish the activities to finish the task and furthermore anticipate or valueate the number of days required in completion of the project. The term of exercises is evaluated based on meetings, research, estimation and strategies of costing. These lengths are relegated in every activity. As the undertaking is of tedious kind, in order to identify the approach connected by utilizing CPM as PP apparatus.



**Fig 6 Activity Details for Phase I Subhash Square to Sargam Talkis**



**Fig 7 Activity Details for Phase II Sargam Talkis to AIIMS Hospital**

Step 6- Creating Resources (Manpower, Machinery and Material)

The assets are prepared using big business asset, where an option is received get the choice of including new assets. Cost of assets relies on its unit as cost of work is on daily wages, material relies on their weight and machinery relies on its working hours along with its maintainance.

Resource ID	Resource Name	Resource Type	Unit of Measure	Primary Role	Default Units / Time
R-1	concrete	Material	cubic meter		0/d
R-2	job	Nonlabor			0/d
R-3	steel	Material	Tons		0/d
R-8	field engg	Labor			0/d
R-1	Field Engineer	Labor		Engineer	0/d
R-1	AAC BLOCK	Material	Each		0/d
R-6	labour	Labor			0/d

**Fig 8 Resource Analysis**

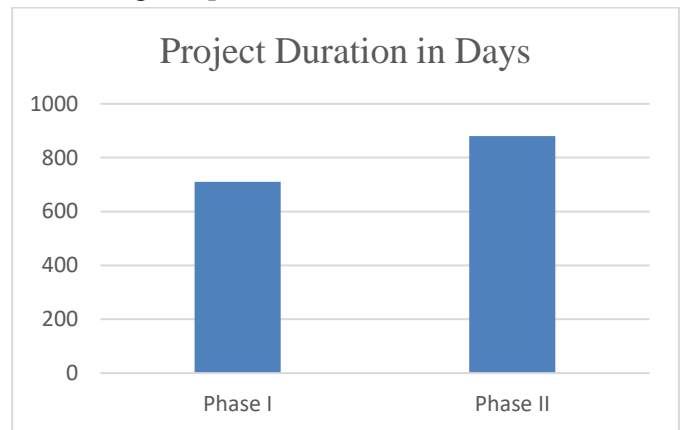
Step 7- Assigning Resources in each activity as per IS. 7272

IS 7272 provide inexact necessity of labour according to the assigned activity. It provides consistent to working labour according to sort of work, this code depends on the prerequisite of work for exercises relying on the jobs required for usage.

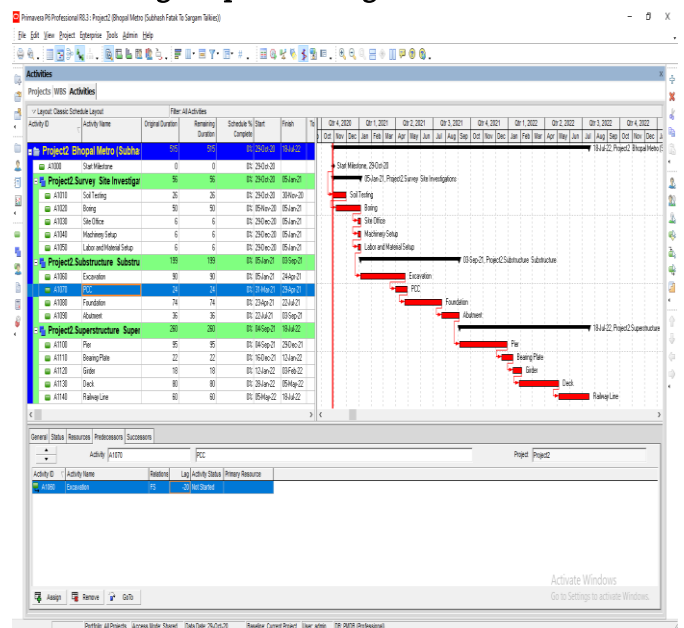
Step 8- Comparison of scheduling proposed as per site scheduling using Primavera P6.

Primavera provides another instrument to correlation of standard versus current advancement of the task knows as Project Scheduling. It furnish with legitimate booking and checking of every last exercises managing and investigating different parameters.

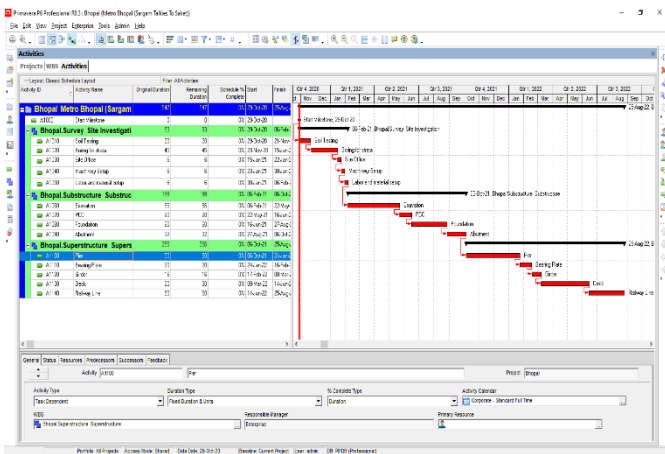
Scheduling comparison:



**Subhash Nagar Square to Sargam Talkis**



**Fig 9 Gantt Chart of Phase I (Subhash Nagar Square to Sargam Talkis)**



**Fig 10 Gantt Chart on Phase II (Sargam Talks to AIIMS Hospital)**

**Conclusion:**

The examination introduced to foster booking and arranging utilizing Primavera P6 V8.3 for Bhopal Metro Project and plan development arrangement and similar investigation in the middle of two courses and ID of reasons in delay. Directing Financial Risk investigation utilizing Primavera P6. Monetary Risk investigation utilizing gantt outline in Primavera P6 and appoint appropriate grouping and connections between various exercises for early completion.

The perception expressed the disadvantages which at last turns into the explanations behind deferral of the venture and thought about the planned of the two periods of Bhoj metro.

In this investigation, minimization of postponement was finished by apportioning assets according to request of action dependent on accessibility of assets and vulnerabilities like lockdown because of COVID 19. The investigation explained work breakdown construction to action level to give legitimate slacking of undertaking the executives according to booking.

Here outcomes reasoned that utilizing project the executives device Primavera P6 allocating and checking every action according to running conditions. In addition, further broke down water signing in removal action because of climate (downpour water) which was set out to save 5 days.

Venture Duration: Observations expressed that the interaction of preconstruction was overseen similarly

by connecting all such exercises specifically getting ready site office, Labor room, and research center arrangement. By connecting the exercises, the time pass decreases at the same time.

**IV.CONCLUSION**

Generally it is seen in the running venture that administration of the relative multitude of exercises and perceptions on their past and next movement is important to run exercises all the while, to streamline the time and cost.

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