

SCHEDULING AND MONITORING OF WORK PROGRESS AT REACH 2B (FROM PIER NO. 573 TO PIER NO. 735) BMRCL USING PRIMAVERA P6

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ABSTRACT: A venture is a cooperation to arrange and accomplish a specific point. Extend includes a few errands to be finished from begin to the last point of venture fulfillment. A timetable of errands is produced in the arranging stage by the venture arranging and booking group that obviously expresses the different venture points of reference and exercises in detail from venture begin to venture wrap up. The nature of the calendar created from Primavera P6, one of the for the most part utilized programming for Project arranging, and booking ought to affirm with industry scales as popular in the western countries. Absence of the learning of different parts of timetable advancement regularly brings about a calendar which is not justifiable by the lion's share of individuals required in the venture and henceforth not useable. The obliviousness with respect to scheduler for the most part results in such kind of timetable which is not reasonable by other individuals, customers chipping away at site. In this way, it is a push to show and ad lib on the calendar improvement by highlighting different fields that are frequently overlooked in the advancement of a decent development plan. Very few complete reviews have been done on the noteworthiness of Activity ID and Description in moderate sized venture plans, in India. A step has been taken to clarify their significance in detail. Booking assumes an imperative part in enhancing the possibilities of fruitful usage of metro ventures. The planning is only one of the apparatuses will be utilized to oversee exercises and term. Work separate structure will be readied length and forerunners for every movement will be dealt out.

directors, Planning specialists ought to have a full top to bottom learning about this product before use. P6 is based on Oracle and Microsoft server connection database for big business wide venture administration scalability. P6 fits effortlessly into today's appropriated workplace by keeping all partners and venture colleagues cutting-edge on venture fruition. The following element of Primavera P6 enables customers to produce reports and keep up legitimate gauge. It helps in separating the mind boggling ventures into a littler achievable, under stable and in a simple way. It decreases the time and the venture can run easily with proficient ways.

Presently a day Metro Rail assumes virtual part in India. As a result of developing movement clog, unprecedented growth of individual vehicles, to stay away from blockage at peak hours, efficient of transporting travellers and fuel utilization. Development industry is a basic segment of a nation's framework and modern development. This industry is the second biggest industry in India still it's development has been differential the country over. There is a huge distinction of improvement in the rural and urban ranges. Here emerges the requirement for compelling task administration. Numerous issues and issues are being confronted by the development business, major of them are cost invades and time overwhelms due to insufficient venture definition, lack of foresight for implementation and disgraceful administration amid execution. Numerous investigators express that normal cost of extend goes up by 30% as of the planned cost because of uncalled for arranging and booking. Perceptions demonstrate that appropriate skilful administration is fundamental for a venture to finish inside time, assessed spending plan and with apportioned assets. Giving great arranging, legitimate association, adequate stream of assets to venture can consequently accomplish the coveted outcome. Primavera Project Planner is had some expertise in dealing with a wide range of undertakings, little, medium and extensive; all through the world. It has adequate capacities to help the client anticipate the time, assets and cost and then later screen them. It is utilized handle very vast and complex ventures, particularly

1. INTRODUCTION

Primavera P6 adaptation has been the least demanding and most utilized programming today. It helps in breaking down the everyday work in the development business. As metro undertakings being a bigger tasks, so the postponement and dangers required in this activities are more. Primavera helps in breaking down the venture by utilizing Critical way technique; it additionally helps in review the venture in Gantt or Pert arrangement. Extend

in the designing and development business. Working venture in primavera resembles working in gathering of exercises with a methodical work breakdown structure.

1.1 OBJECTIVES

- 1) To distinguish whether the customer prerequisites are met.
- 2) To guarantee that the top request choices are made in view of accessible site information and arranging.
- 3) To show where enhancements should be made.
- 4) To decrease the length of the venture by applying appropriate exercises and assets time to time.
- 5) To examine the venture delay by legitimate following of the work on regular schedule

2. LITERATURE REVIEW

1] Veena HC et al (2016): In this paper it has been the general timetable control methods are valuable in streamlining asset booking and venture length. General strategies, for example, are slamming procedures, lessening the action span, expanding the assets, applying timetable or expanding the working hours of the assets.

2] Umesh Y Polekar et al (2015): In this venture legitimate arranging is made with booking and what are the purposes behind the postponement in the venture is contemplated with appropriate following and refreshing. What, who and Where the work is done today and how much the function is finished on regular schedule is refreshed.

3] T. Siva Nagaraju et al (2016): Proper Planning and booking is critical in Metro Rail development ventures for diminishing and controlling deferrals of the venture. Considerable measure of time, cash, and assets are squandered every year in a development industry because of inappropriate arranging and booking.

4] Satinder Chopra et al (2014): Deliberate stream of work is received by utilizing systems called Critical Path Method (CPM) and Program Evaluation and Review procedure (PERT). The state for administration of the venture .and the objective proposed to accomplish extends arranging is to deliver a period table of work with every exercise. The fundamental objective expected from the venture is too finished with legitimate arrangement and timetable inside the gross spending plan apportioned for real venture.

3. SCHEDULING

Arranging is the assurance of the planning and gathering of operations in the undertaking and their get together to give the general fruition time.

3.1: STEPS INVOLVED FOR SCHEDULING IN PROGRESS OF PROJECT BY PRIMAVERA:

Creating a New OBS: In an association where best level administration people group's assignment is depicted under their expert experience is keep running into chain of command level.

Creating a New EPS: The Enterprise Project Structure is incorporated administration of different undertakings sorts work in the association, a progressive based structure that speaks to how activities are composed.

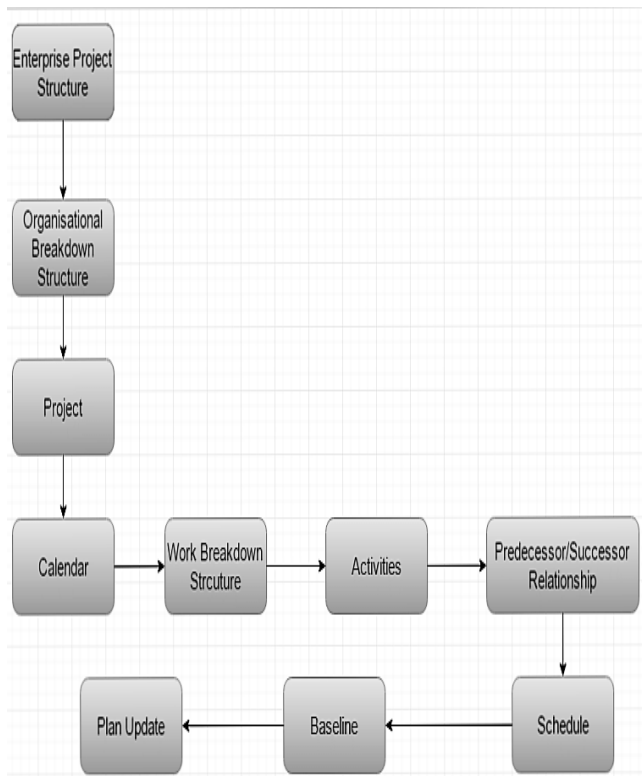
Creating a WBS: The gathering of occasions and undertakings in a venture isolating or recognizing into little work bundles depending on their merits is assigned in project.

Creating calendars: Creating another logbook or Modify to alter a current one. Choosing the Calendar that we need to use as a layout for new Projects. Modify the Work Week include work/non-work days. Check the "Default" Box to make the default Calendar for every future venture.

Adding Activities: Exercises are the essential work components of venture and they can additionally separate into steps. Exercises are the most reduced level of WBS.

Duration: It's the reason for assessing the chose movement's fulfillment time which decides if the timetable, asset accessibility or cost is most imperative when refreshing exercises

Reschedule: Distinguishing the postponed movement entering the genuine rate of finish set up of virtual rate to know the effect of deferral to run the real term remains



ENTIRE PROCESS OF SCHEDULING WITH UPDATE PLAN

BENEFITS OF PRIMAVERA SOFTWARE

- i. **Primavera P6 Reduces Risk:** Precisely when your timetable has variations from the norm, messes up, or assault issues, meander costs will make. This could mean cutting more fundamental parts of the errand to change for the wealth spending costs. Utilizing P6 sees and mitigates dangers to navigate of orchestrating, directing, and completing an attempt.
- ii. **Forecasting of each activity in the project:** As an attempt develops, the meander needs additional assets, activities, and errands which will help in accomplishing demands. Inside Primavera P6, meander chiefs may analyze the figures for assets, works out, and other meander needs.
- iii. **Tracking Activities:** The accompanying segments of Primavera P6 empower clients to rapidly make reports, guarantee all expects are done as asked for, and keep up example adherence.
- iv. **Organization improvement:** Since correspondence is redesigned all through a meander, it's definitely not hard to perceive how improved correspondence changes over into upgraded joint exertion. This is especially basic when activities cross immense zones. For example, meanders in the vitality time business endeavors may require joint exertion between various varying gatherings.

v. **Difficult Projects break down:** Level of an endeavor can overwhelm. P6 licenses meander boss to break immense attempts into tinier, easy attempts, errands, activities.

4. METHODOLOGY AND ANALYSIS:

I filled in as understudy in BMRCL Ltd. as per the VTU embraced syllabus in third semester. It was an amazing opportunity to working improvement industry people. The worked almost and took after the improvement of Metro works at Bangalore. The season of my impermanent employment was 4 months. I closely watched all the work which was been going out there and the contribution with the all-inclusive community working there give me a compact idea in regards to wearing down my M.Tech expand. The data which I assembled in the midst of my transitory occupation period help metro do the wander. Extend title is "arranging of metro wander of association application using" prophet primavera P6.

4.1 WORK DETAILS

Improvement OF above ground level structure of 4.869 km (APROX) from Pattanagere to Challegata for Bangalore Metro Phase2 extend which incorporates 2 station lastly ends at the mouth of the new challegatta terminal.

- 1) MAILASANDARA STATION (135M)
- 2) KENGERI STATION (135M)
- 3) DEPOT STATION (135M)

4.2 EXCLUSIVE STATIONS:-

- A) Start of Contract to Mailasandra Station
PIER 573-PIER 629 (EXCLUSIVE STATION)
- B) Mailasandra Station to Kengeri Station
PIER 630-PIER 686 (EXCLUSIVE STATION)
- C) Kengeri Station to Start of depot turnout
PIER 687-PIER 735 (EXCLUSIVE STATION)

4.3 CONSTRUCTION METHODOLOGY:

For the entire Reach 2B Extension line pile foundation has been selected. At Stations maximum piles are end bearing piles, there are two different sizes of pile used (1) 1.2m Diameter Pile (2) 0.6m Diameter Pile.

End Bearing Piles: These piles are taken till hard rock strata, and most of the carrying capacity is derived from the base of the pile on to the hard rock strata.

Surveying: First step for piling is surveying, to locate the pile. The survey activity at the beginning shall be carried out with a total station of 1" accuracy and from the transverse the stationed engineer at the site shall take points shown in the approved drawings the levels at each location.

Fabrication of reinforcement cage: Reinforcement cage is fabricated at the casting yard and transported to site using a trailer.

Boring: After the pile point is located, boring is started with a hydraulic rig using a Auger. This initial boring is done till a depth of 4m.

Socketing: After a hard rock stratum has been reached, Tripod is erected and Connected with a winch to carry out Chiseling and bailing in the bore.

Lowering Reinforcement Cage: The reinforcement cage is Cut as per the depth of the pile. The cage is lifted with the Help of type mounted crane of 15Ton capacity and lowered in to the pile.

Concreting: The temporary casing is lifted from the ground level and covered on the sides with the help of bags of sand. Before concreting starts tremie pipes are to be fitted and lowered

RELATIONSHIPS:

For piling:

Auger boring → chiseling → cage

lowering → flushing → concreting

For pile cap including backfilling:

Pile excavation → chipping of pile → levelling with PCC

bed → reinforcement ring for pile

cap → shuttering → concreting

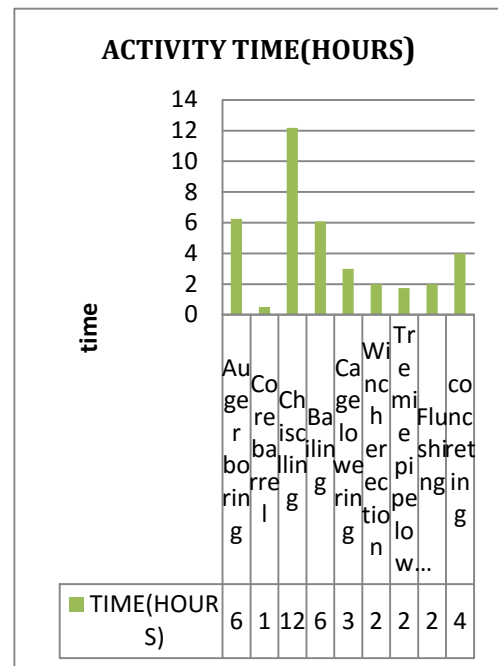
For pier:

Pier starter → reinforcement

tying → shuttering → concreting → curing

Table No.1 Showing the Activity Summary Of Piling For Pier No. 585

ACTIVITY	TIME(HOURS)
Auger boring	6.3
Core cutting	0.5
Chiseling	12
Bailing	6.1
Cage lowering	3
Winch erection	2
Tremie pipe lowering	1.8
Flushing	2
Concreting	4

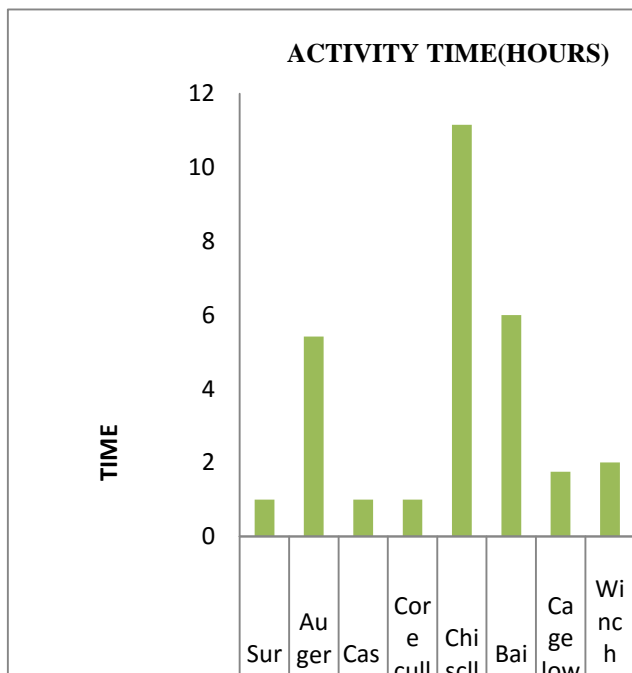


Graph No 1. Activity Time Cycle For Piling

Comment: hence here we observe that the longest time is consumed during the process of chiselling

Table No 2. Showing Summary Of Activity for Piling Of Pier 626

ACTIVITY	TIME(HOURS)
Survey	1.00
Auger boring	5.42
Casing	1.00
Core cutting	1.00
Chiseling	11.16
Bailing	6.00
Cage lowering	1.75
Winch erection	2.00
Tremie pipe lowering	1.08
Flushing	1.33
Concreting	4.50



Graph No.2 Time Cycle Activity for Piling of Pier 626

Comments: hence from both the time cycle to observe that the maximum time is consumed during the process of chisclling.

Table No.3: Showing Activity Time Cycle Of Pier Segment on Pier Segment Mould

SL NO.	ACTIVITY	TIME(HOURS)
1	Clean the bed	0.5
2	Fix the external formwork(outer shutter) including cleaning and oiling done parallel activity	1.5
3	Fix end bulk heads from one side	1.0
4	Lower the rebar cage and place it over casting bed using 20T gantry	1.0
5	Fix the anchorages	2.0
6	Attach the sheathing pipe to the trumpet	1.0
7	Inspection by client	1.0
8	Provide inserts, holes etc. for temporary lifting and pre stressing	1.0
9	Fix bulk heads of span side	1.0
10	Inspection and	1.0

	approval from client for concreting	
11	Concreting of the segment	3.0
12	Setting time for concrete and waiting period for attaining M25 so that the shutter can be removed	30.0
13	Lifting of segment	1
	Total	45 hours

Typical cycle time=1.5 days

Above cycle time can easily produce 15/16 segments per mould per month

Requirement of production for erecting 18 spans per month=18x2=36 segments

No. of moulds requires=36/16=2 moulds

As far as possible the pier segment shall be cast during day time for proper supervision and monitoring purpose.

Table No. 4: Showing Activity Time Cycle Of Normal Segment on Long Line Bed

SL NO.	ACTIVITY	TIME(HOURS)
1	Clean the bed	1.0
2	Fix the external formwork(outer shutter) including cleaning and oiling done parallel activity	2.0
3	Lower the rebar cage and place it over casting bed using 20t gantry	1.0
4	Inspection by client	1.0
5	Attach the sheathing pipe to the match casting segment	1.0
6	Fix end bulk heads from the other side	1.0
7	Provide inserts, holes etc. For lifting & temporary pre stressing	1.0
8	Inspection and approval from client for concreting	1.0
9	Concreting of the segment	4.0
10	Setting time for concrete and waiting period for attaining M25 so that shutter can be removed	24
	TOTAL	36 HRS

Typical cycle time=2days

Above cycle time can easily produce 10 segments per 7 days which means at least 4 spans per month.

Requirement of production for erecting 18 spans per month= $18/4=4.5$ longline.

5. RESULTS AND DISCUSSION:

- 1) As the project is ongoing so it is on the progress stage and is going as per the schedule.
- 2) In stretch 1 from Start of contract to Mailasandra station i.e. from pier 573 to pier 629 all the pier works are completed only the launching of span is not started and the work is going as per schedule.
- 3) In stretch 2 from Mailasandra to Kengeri station that is from pier 630 to pier 686 only 13 piers have been completed, 9 are ongoing and the rest are not started yet.
- 4) In stretch 3 from Kengeri station to Start of Depot turnout i.e., from pier 687 to pier 735 all the piers, portal piers are completed only the launching work is left
Finally the project compares all the schedule techniques and let us know the actual performance of the project, so as to take quick decision by the planning engineer/project manager in case of schedule parameters

CONCLUSION

- 1] The outcome is inferred that the Activity ID and Activity Description both the most unused part can enormously upgrade the nature of the timetable if utilized legitimately.
- 2] It is the obligation of the arranging group to precisely choose the Activity ID structure ahead of time in this way, that timetable planning streams easily with no contentions.
- 3] Thus all the necessary factors with respect to risk management in metro rail projects has been formulated and questionnaire has been designed and the questionnaire will be distributed to the corresponding persons who are working in metro rail projects and by making use of software the response collected from the distributed questionnaire will be analyzed and appropriate suggestion and recommendations are made.
- 4] Studying activities of the project has been done by using primavera which describe easily each of activity of the project.
- 5] Analyzing the input data of the project and reporting the output data by which the ability for comparison between the original plan of the project and the required date of the project can be performed.

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