

# PLANNING, SCHEDULING, RESOURCE ALLOCATING AND TRACKING OF RESIDENTIAL (G+2) VILLA USING PRIMAVERA P6

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**Abstract** - Planning, scheduling and required quantity of resources with regular tracking is very important any construction projects to reduce delays of the project. Due to improper scheduling, irregular monitoring and controlling of ongoing activities substantial amount of time and resources is wasted with this desired goal is not achieved. In the present work, study is carried out on residential (G+2) villa. This study covers the process of planning, scheduling, tracking and controlling of activities. The software used for this study is primavera p6, this tool is utilized throughout from planning phase to tracking and controlling of a project, it reduced huge amount of paperwork. Only development of schedule doesn't make a successful project in construction, it further need to be tracked regularly, for this, baseline have been managed for comparison between the planned progress and actual progress by primavera software for proper recognition of problem which cause deviation. Many uncertainties occur in practical work leads to delay. By using software techniques, applying resource dependency, rescheduling of the project by crashing and fast tracking of critical activities overcome the delay duration.

**Key Words:** Planning, Scheduling, Monitoring, Crashing, Fast Tracking.

## 1. INTRODUCTION

In this present scenario, construction is being increased day by day and now it is at higher demand. Constructional companies deals with these many kinds of projects daily. Different worldwide organizations manage the constructions each day and which has turned into a most imperative piece of business.

In the older days the software were not used in construction projects. No planning or scheduling was done constructional activities as it was directly executed by contractor and planning was done manually Now a days, architectural planning is done with the help of many software but for the execution no proper management was done which leads to the delay for the completion of work. Thus this attempt is made to achieve proper method over the construction activities with the utilization of software.

Primavera is an advance computer integrated enterprise project management tool. As we know India is booming in construction industry so we should be familiar with tools like primavera which is highly advance management tool with recorded data base ORACLE this tool is web assessable for modification in an any situation in management activities .this tool work simultaneously for multi project at a time can be monitor and control all the project.so proper management is required with documentation and this can be possible if we know primavera tool completely and properly.

## 2. OBJECTIVES

- To recognize planning procedure utilized in creating planning and scheduling.
- Creating work breakdown structure (WBS) in which single large project into small portions/pieces for planning and control purpose.
- To find out the stepwise preparation of activities of construction for a residential building.
- Scheduling of critical path by keeping duration of activities as constraints.
- Allocating required estimated and type of resources to individual activities to perform each events.
- To know the significance of providing baseline during tracking of execution of constructional work.
- Importance of monitoring on regular basis to progress of villa and distinguish on actual and planned schedule.
- Effective rescheduling in plan during negative float to sort within given target.
- Overcome the delay in program by analysing compression of critical plan.
- Implementation of method and enhancing the schedule by various relationships, duration, man power, calendars for effective management for completion on time.

### 3. METHODOLOGY

#### 3.1 PLANNING

Venture arranging is the capacity in which venture and development administrators and their key staff individuals readies the ground breaking strategy. At that point this all-inclusive strategy is put into time plan by planning responsible which is called extend booking. A venture design is generally in charge of the achievement or disappointment of a venture. Plan is first step of venture administration reasoning of arranging, sorting out and controlling the execution of the planned setup.

It is a most important and challenging activity in management as well as execution of projects. It involves the choice of technology, the definition of effort task, the estimation of required durations and resources of individual activity, and identifies the connections in between different work tasks. A plan is the base for evolving the schedule, development of the constructional plan is an acute task in construction management. Firstly a planner must keep a goal which is required to achieve.

In this project, primary importance is given to duration of activities, which means duration of all the events in construction are kept as constraints and based on the productivity of resources, the amount of required resources (labor, non-labor) are estimated and assigned to particular activities.

#### 3.2 SCHEDULING

It displays the duration and order of various construction activities. Scheduling can be also well-defined as the comprehensive plot of the project work tasks through reverence to time. Without schedule it is hard to clarify so system, logic, and manpower requirements means of building a project. The project schedule serves as a primary means of relaying construction plans, The construction schedule also communicates means and methods, as well as planned sequences and timing for a project. It is the lay out of the project activities with a time sequence in which they have to be perform, the start and finish dates are assigned to each activity, relationship with each other of these events are to be provided with logic and common sense with a proper lag of duration if required. Scheduling is completed when all activities in project after providing duration and necessary relation to it. Entering the start date of project on data date will automatically provide the all the start and finish date of every activities.

#### 3.3 RESOURCE ALLOCATION

Resource allocation is a method use to assign the required resources to the activities. In project management, resource allocation is supply required by those activities while considering both resource availability and project time.

Resources include such as man, machinery and material. Before assigning, they have to created and categorized based on the labor and non-labor, and their units. Amount of resources to be assigned depend on the duration of a particular activity. These sources are calculated by their productivity of it per day.

#### 3.4 TRACKING

Supervising the activities of the progress so as to ensure that they are on-schedule and meeting the required goals and objectives . It is nothing but the updating the project as per schedule and recording the progress of individual activities performed based on specified time and resource. It is second major stage in project management. Monitoring is like a cautionary mechanism, it is the procedure of collecting, recording and report the data regarding project performance that the project manager. Monitoring includes inspection the advance of in contradiction of time, performance schedule in addition to resources thru actual effecting of project and it identified the lagging regions which require judicious actions besides attention.

In the progress of project some activities will complete within provided duration and some delays due to various reasons. Properly monitoring will be helpful in identifying the difference between actual work and original plan. After scheduling it is very vital to monitor the practical operation of work onsite based on the data collected further rescheduling is performed. During the proceeding of project, monitoring is done by comparing the baseline provided indicated by yellow color, monitoring regularly shows whether the construction is behind or working as planned. If the project progress is behind schedule, it shows total floats negative values of delayed number of days. It should be done on regular within short gap of time in order to implement some methods if any delay took place to make the upcoming schedule parallel with the baseline.

#### 3.5 COMPRESSION

When there is a delay during the execution of construction activities, which can occur due to any many uncertainties, delays are the extension of time beyond planned dates of completion. It is the late completion of construction work compared to the contract schedule. This can be reduced only when the reason for delay is identified.. There are various reasons delay occur due to client, contactor, consultant, designer, materials, equipment's, labor and weather causes etc. The delay which occurred in critical path of project will have effect on the completion date of project causes to generate slack in minus value, if the delay of such activity occurs which are at the non-critical path having considerable total float it will not have effect on the completion of project duration. When there is situation happens that caused the deviation of schedule from its baseline generating undesirable float. To overcome this compression techniques can be utilized to reduce the duration of activities and

overcome the effect of delays. This technique can only be applied to activities that befall on critical path because applying to non-critical will not be advantageous rather it would be disadvantage as goal is not achieved. Compression can be subdivided further into crashing and fast tracking. Crashing is a schedule compression technique in which extra resources are added to reduce completion time of activity. Initially the critical path should be analyzed and select the desirable event for which crashing should be performed. While using crash procedure it is important to have tab on another path as it has risk that duration of any other path may become critical. Examples for applying crash such as increasing the resources, providing overtime shifts, inspiring the team by financial/bonus rewards. Fast tracking is also a compression method by using parallel or partially parallel performance of activities can done. This also must be used on critical path by evaluating the schedule, however there is increase on risk as events will be on parallel which were in the sequence when planned in the beginning. It helps in reducing the time to a certain limits it may lead to high risk and undesirable outcome may be resulted.

#### 4. DATA ANALYSIS

It is the project based on the G+2 residential building which is being constructed in the kalaburagi city. All the necessary data required have been extracted from the documents provided by client and contractor for the purpose of producing the schedule of activities based on the duration which is involved in construction, providing necessary resources to each one of them. Site is located in a congested area so to practically make the construction is quite tough. This house consists of 8 bed rooms, 3 halls and 6 bathrooms. All the quantities have been taken from the BOQ provided. Duration for each activity is given by contractor based on it scheduling is done.

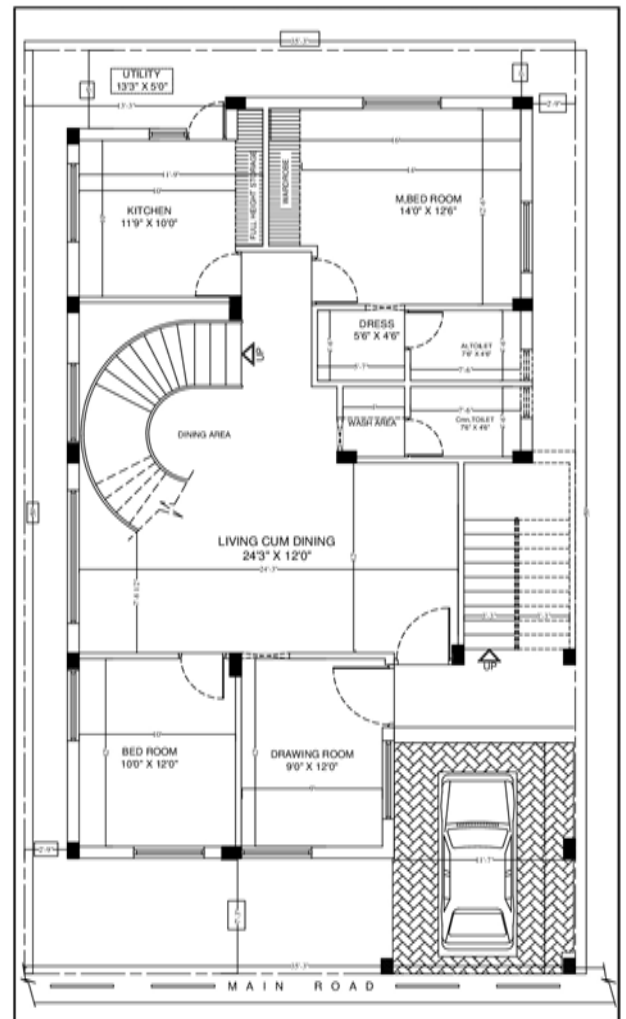


Fig 4.1 ground floor plan

Table 4.1 project details

Project name	RB villa
Type	G+2 residential
Client	Jameel ahmed
Contractor	Nitin Chauhan
Site location	Hagarga road, kalaburagi
Size of plot	40 x 60
Built up area	4250sqft
No of footing	Total 18, isolated type
Commencement date	25-mar-2017
Finish date	22-dec-2017
Project Duration	234 days

Table 4.2: Activities Delayed Details

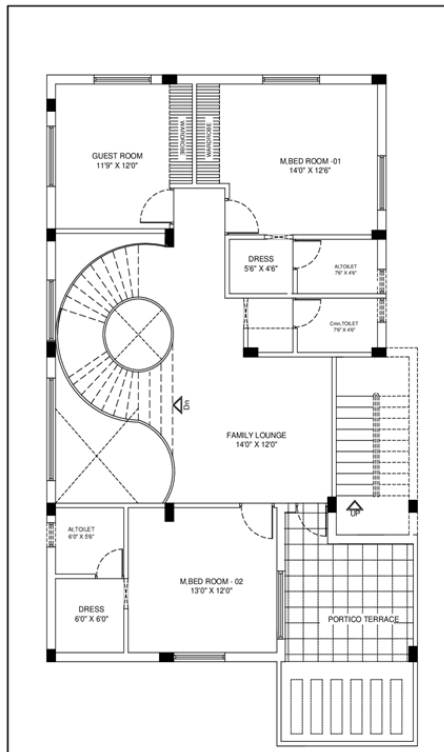


Fig -4.2 first floor plan

ID	Name	Scheduled start date to finish date	Actual start date to finish date	Total float
ILS1040	footing excavation	27/march/17 to 4/April/17	30/mar/17 to 7/April/17	-3
ILS1110	backfilling	24/April/17 to 27/April/17	28/April/17 to 02/may/17	-4
ILS1290	Brickwork up to lintel (gf)	18/may/17 to 29/may/17	20/may/17 to 30/may/17	-2

Reasons for above mentioned delay

1. Improper coordination between contractor and labour leads to late start of excavation at original date.
2. There was a conflict as payment was not done caused labours strike and effect schedule.
3. Bricks which were procured was not of desired quality, hence it was returned and exchanged.

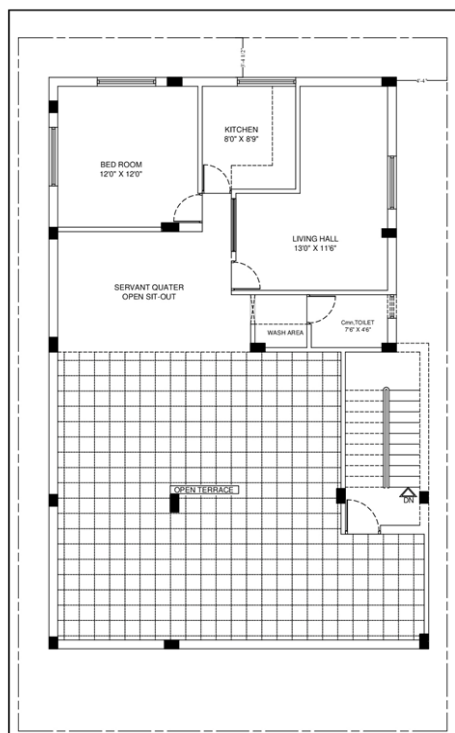


Fig -4.3 second floor plan

ID	NAME	SCHEDULE D DURATION	DURATION AFTER CRASHING	TOTAL FLOAT
ILS1060	footing shuttering & rebar	5 days	3 days	(2-3)= -1
ILS1100	plinth beam shuttering & rebar(gf)	6 days	3 days	(3-4)= -1
ILS1296	brick work above lintel(gf)	5 days	4 days	(1-1)=0

Table 4.3 Crashed Activities

Id	Name	Original Relation with predecessor	Changed relationship	Total float
ILS1070	Footing concrete	FS=0 d lag	SS=2 d lag FF= 1d lag	(1-1)= 0
ILS1140	Column concrete	FS=0 d lag	FF=0 d lag	(1-1)= 0
ILS1142	Lintel concrete	FS=0 d lag	FF=0 d lag	(1-2)= -1

Table 4. Fast Tracked Activities

## 5. RESULTS

This is an ongoing project, the work progress

Scheduled Duration For Project	234 Days
Duration Completed	65 Days
Remaining Completion Duration	169 Days
Substructure	100%
Superstructure	22.86%
Project Accomplished	27.78%
Crashed Period Value	4 Days
Fast Tracked Value	3 Days

## 6. CONCLUSION

- Regular monitoring of the work under execution must be done at least within week in order to take adequate actions against uncertainty.
  - Primary baseline and Gantt chart produced makes easy to identify critical path and monitoring task against it progress extremely easy by observing colors of bars.
  - Carrying out review to view deviation in schedule helped and control against planned agenda is just piece of cake with this software.
  - WBS helped to organize, arrange and know the work completion in percentage at every portions/nodes in it.
  - Augmented scheduling done by effective relationships between events, project duration of 234 days has been obtained which gives huge carpet area as compared to 365 days required by contractor.
  - Proper co-ordination and ease of communication of contractor with labors is very important for smooth running of assignment.
  - In this project by applying crashing and fast tracking method duration of selected events is reduced to reschedule within the baseline.
- Using primavera technique of resource dependency, compression of various activities is done by increasing working hours.
  - Primavera (P6) proved to be a better tool for scheduling, monitoring and controlling and shows its efficiency in providing best results with less effort of user by preventing enormous volume paperwork.

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