

Integrated Approach of Planning, Scheduling & Resource Management of a G+2 Residential Building using M.S Project 2010

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Abstract— One of the greatest difficult work that any manager can take on is the organization of project which involves various activities during the development of project. In the present study an attempt is made to develop an effective planning and schedule of G+2 residential building project by which project management will become very easy. Time needed for accomplishment of each task is assigned through software (MSP 2010). Necessary resources to execute these activities is assigned for every activity. Cost required for completing all activities and stages of construction in project is also analyzed and weekly cash flow has been generated.

Key words: Planning, Scheduling, Resource Allocation, Construction Management, Microsoft Project 2010

I. INTRODUCTION

A. General

The construction business is the second biggest business of Indian nation after farming. And it plays a vital role in building the national economy and at the same time, it gives large number of group of people for job opportunities. There is an increasing urge or need for project managing and controlling on current development projects. The principle purpose of planning any venture is basically to make a time table of each assigned action/work and giving a beginning and completion date. The means required for such a decent planning incorporates, investigation, timing, facts based and which things that will be done and at what times they will be done. For project planning and scheduling number of techniques were used like CPM, PERT, Bar charts.

In particularly big construction ventures making precise and good timetable with a thought of an available resources is quite a tough job, due to which of some computer programs or software packages for project administration like Microsoft project and primavera will be an worthwhile idea. Use of such modern software's for construction projects has increased because many large or mega projects are currently being constructing all over the world. The main useful advantage of project planning and scheduling is easy going of project without any conflicts or clashes or losses or any other unwanted or unknown disruption in the project.

B. Problem Statement

Appropriate or needful directions and fulfillment of any venture within time can be accomplished just by needful planning which is done at pre construction stages of project. This is done might be because of absence of labor, deficiency of required materials etc. previously, the projects had confronted or faced certain issues because of in appropriate planning methods. These issues have leads to postponement of activities and have made clashes between

the individual persons or people involved or who are taking part in projects. Probably this occurs because of absence of thoughts regarding planning and also failed to take care towards planning.

C. Objectives

- 1) To determine the detail activities involved in project.
- 2) To know the duration (i.e. Start and completion) of project
- 3) Ideal utilization of resources and to let know which activity need what type and amount of resources
- 4) To have a clear picture of project details to both owner and contractors in order to reduce the clashes between them with the aim to complete project ton time and cost allotted.
- 5) To know in-depth schedule of work i.e. how each and every activity is going to carryout in the project.
- 6) To make easy, work activity is arranged or created in such a manner that, understanding of project stages or level of completion.
- 7) To know the cost of each activity and cost required for completion of different level of project or stages of construction of building

II. LITERATURE REVIEW

A. SK. Nagaraju et.al (2012):

Finally, this study says that If resource restrictions are lessened to ten to fifty % it affects over-all time interval of work which leads to escalation of 2% -18.23 %. And in drop of resource constrictions, leads to expansion in time intended for resources like masons by 19.7%. this will give to surcharge in unforeseen money in venture & lastly boosts entire work expenditure around 1.684%.

B. Md Imran Khan et.al (2015):

The examination is completed for built up, a compelling framework for checking and controlling for the cost of a venture, with the goal that venture cost has the fundamental elements for accomplishment of a venture (EVM) earned esteem administration is a best procedure for assessment which is helpful for the venture administration. This system helps in the spending cost and real cost the present investigation manages the planning and venture checking process, with the goal that accommodating for the parameters which is included in the computations of EVM in common development ventures. Microsoft project V 2010 is utilized for EVM figuring's

C. P M Wale et.al (2015):

This paper also made an effort to familiar with scheduling technique by incorporating network models such as CPM and also how duration of projects can be reduced when compared to real duration required for completion and how

best labor work can be made easy and lower the price by perfect distribution of resources. This paper clearly shows that MSP is easy to be familiar with the flow and network of project and critical path i.e. longest path, activity or tasks which are parallel in nature and slacks, duration required to complete the work (project) by MSP is lesser than the conventional method and whereas cost has been lowered by 2% of overall expenditure by conventional process.

D. Abhishek Sharma and K.K. Pathak (2015):

He finally said that, the organization which decides the connectivity between several tasks which aids the site engineer to decide the significances of activities. Taking the data regarding the convenience of labours present at correct time for tasks is a very important role in handling the budget and uninteruply accomplishment of job. Microsoft Project 2013 is the current application in today's time to achieve the assignment competently. MSP also assist to boost administrator's effective presentation regarding losses of resources.

E. Komal Kiran et.al (2015):

A deliberate investigation is endeavored by building up a work breakdown structure for whole venture to set up work components for evaluating different assets against time and cost. A system is built up contemplating all the forerunner and successor exercises. The system is then upgraded through smashing of exercises to get ideal arrangement and fills in as a base for advancing aggregate venture cost. At long last, straight programming model is utilized to figure the arrangement of smashing system for least time by LINGO model and Microsoft Excel. These models consider numerous contemplations of venture consequently decreasing the span of venture. At last, correlation of both the product yields and the manual estimations is done and the best verifier is resolved.

III. CONSTRUCTION MANAGEMENT

A. General

Project is nothing but a target or commitment, which is an attempt to make a special, different one of its kind, an item/benefit or result or utility under a given prescribed goal, high level of value duration and expenditure. The main key parts or section required to take care of any project includes, techniques or methods of handling and supervising projects, practices or work experience in managing on a general basis and methods or ways with respect to subjects. There is a huge better future or demand for knowledge in building industry or business, where manpower, resources, equipment's, costs/expenditure and ability of arranging and doing work, coming together for developing a utility or facility.

B. Approach to Construction Management

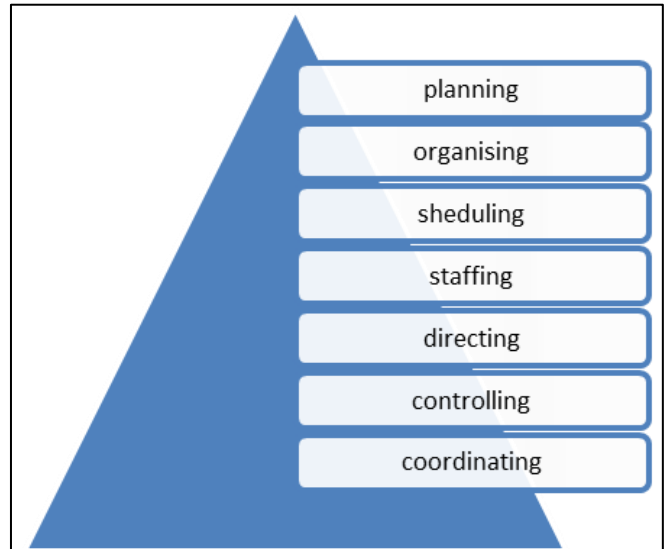


Fig. 1: Approach to Construction Management

C. Construction Planning

It is the beginning stage of any project, where decisions taken regarding methods adopted for execution of work. In order to prepare a plan to be correct or as per desired, the goals of plan are accurately guided and observed and checked, for good control over the plan of project, communication among the respective persons is very important.

The best way adopted for planning in all construction ventures till now is graphic scheduling, which incorporates amount of materials, various resources, connection among tasks and time required for execution of tasks.

1) Work Breakdown Structure

The various group of tasks or activities of project is connected together by adopting a hierarchical method known as work breakdown structure (WBS). The entire project can be impressively planned by dividing or separating the project into sub activities or tasks. This contains of major tasks at macro level and their subtasks at micro level. The tasks are separated until the project is divided into activities which are easy to manage and perform.

Some of the points should be kept in mind while preparing WBS i.e.

- 1) Order of tasks to be performed
- 2) Cost information
- 3) Separate items cost
- 4) Site of project
- 5) Project type
- 6) Manpower type

D. Construction Scheduling

Arranging planned activities to a duration scale showing beginning date and completion date for every activity in combination with their relation is known as scheduling. As the work goes on, this is analyzed with real progress, if any changes from schedule is seen them work is done faster to prevent delays in finishing. Order of schedule is helpful in choosing inter connection among activities included in project.

There are number of types of Scheduling Techniques such as Bar chart, PERT (Program evaluation and review technique), CPM (Critical Path Method)

E. Resource Management

Resources are the physical amount like labor, budget(cost), material, machineries, duration, which are needed for completing any work. The principle and essential goal of any company is not to use resources unnecessarily. The resources have to be used to greatest conceivable limit as it is available in location. If the time of finishing of project is decided, use of resources has to be done not altering the total time required for project. The system by which resources are assigned and used, decides the desired results of construction project.

Types of Resources

- 1) Material type resources: cement, sand, aggregate, concrete, door frames and panels, steel, tiles, marble, wood, bricks etc.
- 2) Work type resources: Mason, painter, plumber, skilled labor, MS work (fitter), male coolie, female coolie, carpenter, electrician, etc.

F. Construction Management Software's

Many project management software's are available in Market, mostly two software's are used extensively all over the world those are, primavera and Microsoft project.

IV. METHODOLOGY

A. Introduction

In this present study, a residential house (G+2) which is an upcoming project considered situated at Humnabad, Dist. Bidar, Karnataka. Based on this all the process of planning, scheduling and resources analysis were done in pre-construction stage, so that an effective path is taken to work out this project.

Following Methodology was Adopted

- 1) Collection of data about the project
- 2) Planning
- 3) Scheduling
- 4) Resources management
- 5) Cost analysis
- 6) Conclusion

B. Collection of Data

Collection of data is very much important, the information one should gather includes drawings such as Plan details, column details etc., specifications of works, bill of quantity.

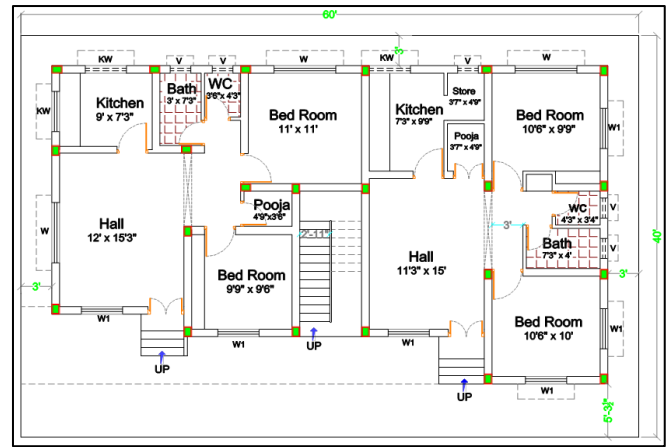


Fig. 2: Plan of G+2 Building

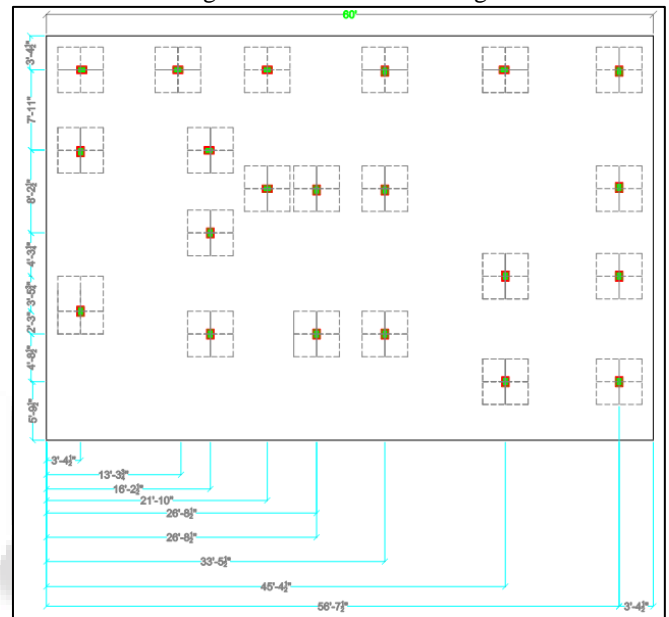


Fig. 3: Column Details of G+2 Building

C. Planning

The important step in whole project is nothing but planning, why because it makes choices of time and resources required to execute the work. Planning is done in all projects in order to find the work well within the acknowledged period or duration and within ideal utilization of resources. In planning stage we came to know about the number of type of activities which we going to perform there by we make or break down our work activities as per required structure.

Activity Types and WBS

In this we have to list out all the work activities which are involved in this project which are to be perform, thereby there are some major activities which involves many activities under it so we to carefully analyses this, so that we can prepare work breakdown structure which we can put into the software for easy analyzing.

This project is planned by the help of M S project 2010 application and WBS importantly guides to allocate WBS codes to all activities. These codes efficiently useful for managers in instructing employees during communication there by, explaining every point in any activity will be easily understood.

D. Labour Productivity

In this project, labour output is calculated or labour standards are taken from the report on labour productivity projects in building industries issued by national building organization and information from B.N. DUTTA text book of estimating and costing in civil engineering and with the guidance of some practicing engineers.

Sl no	Description of work	Qty	Unit	Labours/day
1	Excavator	25	m ³ /hr.	1 excavator of 0.4 cum/hr. bucket capacity
2	Backfilling	28.3	m ³	2male coolie, 2 female coolie
3	Cement concrete (pcc) in foundation	5	m ³	1 mason, 3 male coolie, 2 female coolie, 1 bhisti
4	RCC work	2.83	m ³	1 mason, 3 male coolie, 3 female coolie, 1 bhisti
5	Rebar tying in all rcc works	100	Kg	1 fitter, 1 fitter helper
6	Masonry works	1.25	m ³	1 mason, 1 male coolie, 1 female coolie

Table 1: Showing Labours Productivity

E. Calculation of Activity Time

The initial phase in deciding the time required for tasks is by concentrating the drawings effectively, and type of work, quantity of work, available labour output, activity duration is found Some of the examples are shown below, that how the labours are allotted and what will be the duration required to complete the activity.

1) *Ex 1: - Column shuttering (ground floor)*

Quantity of shuttering = 131 Sqm
 productivity: 1 carpenter, 1 helper = 5 m²/ day ∴
 Assigning 4 carpenter and 4 helpers= 20 m²/day ∴
 total duration required to execute work = 131/ 20 = 6.5 = 7 days

2) *Ex 2: - Rebar tying for plinth beam*

Quantity of steel = 1 tone= 1000 kg
 Labour productivity: 1 fitter, 1 helper = 100kg/ day
 ∴ assigning 2 fitter and 2 fitter helpers = 200 kg/day ∴
 total time needed to finish the activity = 1000/200= 5 days

3) *Ex 3: - Column concreting (ground floor)*

Quantity of concrete = 7.2 cum
 Labour productivity: 1 mason, 2 male coolie, 3 female coolie = 2.83cum/ day ∴ assigning 3 mason, 7 female coolies, 8 male coolie = 8.5 cum/day
 ∴ total duration needed to finish the task = 7.2/8.5= 0.85=1 day

F. Scheduling

Now the use of M S project 2010 will be going to start. After gathering all drawings and listing out the activities to be done along with their duration to complete the work and resources needed to execute the activity, next step is to input the data in the software and analysis the information to know the start and finish dates.

The procedure followed for scheduling in M S PROJECT 2010 is as follows: -

- 1) Creating a new project plan
- 2) Allocating details of calendar
- 3) Assigning project information
- 4) Creating all the activities along with WBS codes
- 5) Assigning duration to each activity
- 6) Giving logic relationships between activities

1) *Creating A New Project Plan*

When we run M S project 2010 program, we will be able to get the option of blank project under the file option, when we click on the blank project, we will be entering in a new project window as shown in below fig

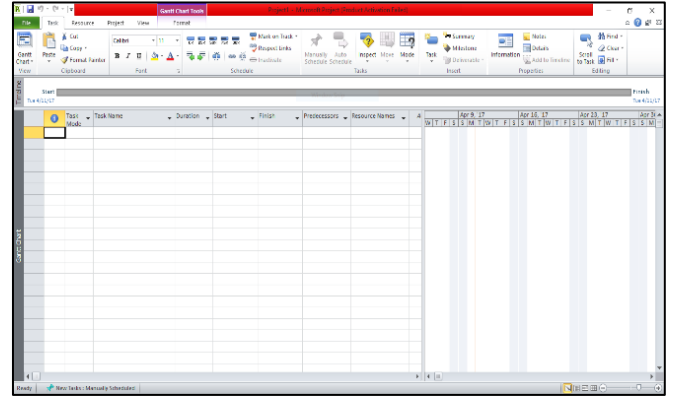


Fig. 5: Showing a New Blank Project Window

2) *Allocating Details of Calendar*

Now on clicking on the project tab, we can select change workingtime option, where we can put the details of way of working time for labours and give the number of holidays were work will not be going to takes place, for this project working time will be 9 am to 1pm and 2 pm to 6 pm, as shown in below fig, here we can set number of hours to be working and we can select standard or create our own calendar

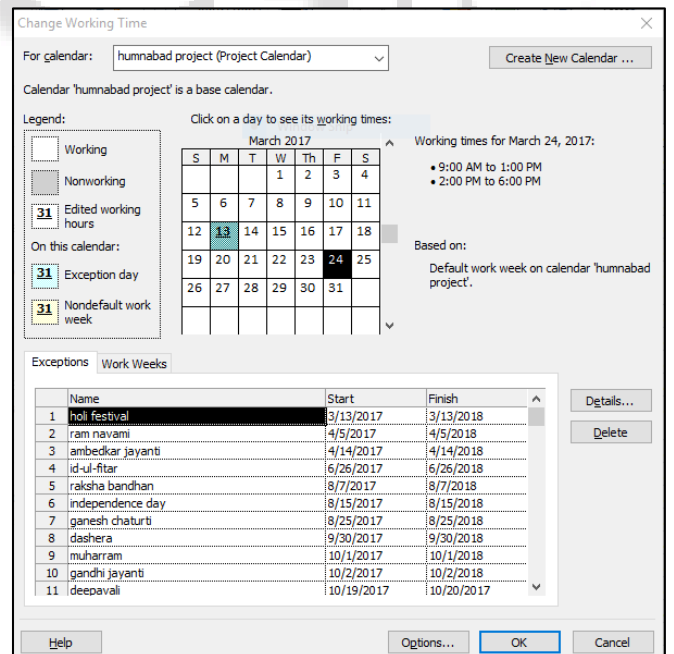


Fig. 6: Showing Details of Calendar

3) *Assigning Project Information*

We can give our project information by choosing the project information option in project tab, where we can put or start date and required calendar and from which date we want the schedule either from project start date or project finish date. MSP will finds the total time period needed for the project

and will schedule the way we put input data as project start date or finish date in schedule from option and as per chosen calendar. As shown in below fig

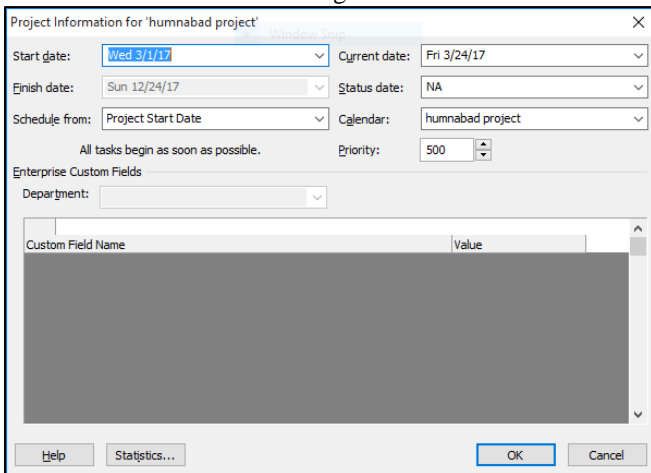


Fig. 7: Shown Assigning Project Information

4) Activities & WBS Codes

It involves creating all the activities, which are included in the project and arranging them in groups or stages of work under the “task name” column with the help of indent option and by out dent option, And WBS codes are to be generated simultaneously which are very helpful to identify each activity by its codes and directing or communicating between worker or employees and management team

Task Mode	Task Name	WBS
1	G+2 HOUSE @ HUMNABAD	1
2	SUBSTRUCTURE	1.1
3	FOUNDATION	1.1.A
4	setting out	1.1.A.1
5	footing & PB & FA excavation	1.1.A.2
6	levelling& pcc	1.1.A.3
7	column footing rebar tying and fixing	1.1.A.4
8	footing shuttering	1.1.A.5
9	footing concreting	1.1.A.6
10	footing desuttering and curing	1.1.A.7
11	COLUMNS UPTO PLINTH BEAM	1.1.B
12	column starter marking and fixing and concrete	1.1.B.1
13	column shuttering	1.1.B.2
14	column concreting	1.1.B.3
15	curing of column and footing	1.1.B.4
16	earth backfilling and consolidating	1.1.B.5
17	BASEMENT	1.1.C
18	basement wall	1.1.C.1
19	curing	1.1.C.2
20	PLINTH BEAM	1.1.D
21	shuttering	1.1.D.1
22	bar bending and fixing	1.1.D.2
23	concreting	1.1.D.3

Fig. 8: Showing How Activities and WBS Codes

5) Assigning Duration to Activities

For the giving the time period needed to execute the project we have to keep in mind some points i.e. labour productivity or working capacity, quantity of work to be done, site experience, knowledge about the type of activity, then we have to assign the duration, which will take interm of days.

Task Mode	Task Name	Duration	Start	Finish	Predecessors
1	G+2 HOUSE @ HUMNABAD	1 day	Wed 3/1/17	Wed 3/1/17	
2	SUBSTRUCTURE				
3	FOUNDATION				
4	setting out	1 day	Wed 3/1/17	Wed 3/1/17	
5	footing & PB & FA excavation	1 day?	Wed 3/1/17	Wed 3/1/17	
6	levelling& pcc				
7	column footing rebar tying and fixing				
8	footing shuttering				
9	footing concreting				
10	footing desuttering and curing				
11	COLUMNS UPTO PLINTH BEAM				
12	column starter marking and fixing and concrete				
13	column shuttering				
14	column concreting				
15	curing of column and footing				

Fig. 9: Assigning Duration is to Activities

6) Linking of Activities

For linking activities to each other, we should be aware that which activity has to be done first or can be done simultaneously. Basically there are 4 types of links which we can give among the activities such as Finish to start (FS), Start to start (SS), Finish to finish (FF), Start to finish (SF). But by default, MSP will take finish to start relationship among the activities.

ID	Task Name	Type	Lag
48	shuttering	Finish-to-Start (FS)	-5d

Fig. 10: Giving Logic Relationship Between Activities

Task Mode	Task Name	WBS	Duration	Start	Finish	Lag
3	FOUNDATION	1.1.A	12 days	Wed 3/1/17	Sun 3/12/17	
4	setting out	1.1.A.1	1 day	Wed 3/1/17	Wed 3/1/17	
5	footing & PB & FA excavation	1.1.A.2	1 day	Thu 3/2/17	Thu 3/2/17	4
6	levelling& pcc	1.1.A.3	1 day	Fri 3/3/17	Fri 3/3/17	5
7	column footing rebar tying and fixing	1.1.A.4	6 days	Sat 3/4/17	Thu 3/9/17	6
8	footing shuttering	1.1.A.5	4 days	Tue 3/7/17	Fri 3/10/17	7FS-3 days
9	footing concreting	1.1.A.6	1 day	Sat 3/11/17	Sat 3/11/17	8
10	footing desuttering and curing	1.1.A.7	1 day	Sun 3/12/17	Sun 3/12/17	9
11	COLUMNS UPTO PLINTH BEAM	1.1.B	12 days	Tue 3/14/17	Sat 3/25/17	
12	column starter marking and fixing and concrete	1.1.B.1	1 day	Tue 3/14/17	Tue 3/14/17	10
13	column shuttering	1.1.B.2	3 days	Wed 3/15/17	Fri 3/17/17	12
14	column concreting	1.1.B.3	1 day	Sat 3/18/17	Sat 3/18/17	13
15	curing of column and footing	1.1.B.4	7 days	Sun 3/19/17	Sat 3/25/17	14
16	earth backfilling and consolidating	1.1.B.5	2 days	Sun 3/19/17	Mon 3/20/17	14
17	BASEMENT	1.1.C	10 days	Sun 3/26/17	Tue 4/4/17	
18	basement wall	1.1.C.1	3 days	Sun 3/26/17	Tue 3/28/17	16
19	curing	1.1.C.2	7 days	Wed 3/29/17	Tue 4/4/17	18
20	PLINTH BEAM	1.1.D	16 days	Thu 4/6/17	Sat 4/22/17	
21	shuttering	1.1.D.1	5 days	Thu 4/6/17	Mon 4/10/17	19
22	bar bending and fixing	1.1.D.2	5 days	Sat 4/8/17	Wed 4/12/17	21FS-3 days
23	concreting	1.1.D.3	1 day	Thu 4/13/17	Thu 4/13/17	22

Fig. 11: Showing Scheduled Activities

G. Resources Management

It involves following steps:

- 1) Resources Defining
- 2) Resources Assigning
- 3) Resources Over Allocation (if)
- 4) Resources Re-allocation

1) Resources Defining

It means inputting the all resources which are required in project in a sheet known as resources sheet. All the resources which are going to be used has to be specified whether it is work type or material type resources.

Resource Name	Type	Material Label	Initials	Max. Units	Std. Rate	Base Calendar
44	aggregate	Material	cum	a	₹ 0.00	
60	bhisti	Work	b	200%	₹ 0.00/day humnabad project	
26	bricks masonry(120mm)	Material	sqm	b	₹ 775.00	
25	bricks masonry(230mm)	Material	cum	b	₹ 5,713.00	
3	carpenter	Work	CP	700%	₹ 0.00/day humnabad project	
54	carpenter helper(interior)	Work	CPHI	300%	₹ 0.00/day humnabad project	
4	carpenter helpers	Work	CH	500%	₹ 0.00/day humnabad project	
53	carpenter(interior)	Work	CPI	300%	₹ 0.00/day humnabad project	
43	cement	Material	bags	C	₹ 0.00	
64	concrete	Material	sqm	c	₹ 453.00	
23	concrete (M5) PCC	Material	cum	M10	₹ 4,770.00	
23	concrete (M15)PCC	Material	cum	M15	₹ 5,393.00	
5	concrete (mason)	Work	c	500%	₹ 0.00/day humnabad project	
24	concrete M20	Material	cum	M20	₹ 6,152.00	
19	concreting female coolie	Work	CFC	1,200%	₹ 0.00/day humnabad project	
16	concreting male coolie	Work	CMC	1,200%	₹ 0.00/day humnabad project	
58	door frame(bath&wc)	Material	mtr	DFBWC	₹ 522.00	
59	door panels(bath&wc)	Material	sqm	DPBWC	₹ 2,646.00	
63	earth filling	Material	cum	e	₹ 254.00	
29	electrical	Work	E	400%	₹ 0.00/day humnabad project	
30	electrical helper	Work	EH	400%	₹ 0.00/day humnabad project	
62	excavated soil	Material	cum	e	₹ 127.00	
2	excavator(0.4cum/ bucket)	Work	e	100%	₹ 0.00/day humnabad project	

Fig. 12: Resource Sheet

2) Resources Assigning

For assigning the resources to any activity, we have to double click on the respective activity for which we want assign the resources. Then one task information window will appear, in that we have to select the resources tab then selecting all such resources and also giving the number of units required to execute that activity.

Resource Name	Assignment Owner	Units	Cost
concrete M20		45 cum	₹ 276,840.00
concrete (mason)		500%	₹ 0.00
concreting male coolie		800%	₹ 0.00
concreting female coolie		800%	₹ 0.00
aggregate		41 cum	₹ 0.00
cement		360 bags	₹ 0.00
sand		21 cum	₹ 0.00

Fig. 13: Assigning Resources to Activities

Fig. 14: Assigned Resources to All Activities.

3) Resources Over Allocation (If)

Many of the times while assigning the resources we experience that many of the resources are over allocated then what is mentioned in the resource sheet. But in MSP if at all any resource is allocated more than mentioned, it will indicate in task sheet as a symbol of “man” and also red color in resource sheet and also in resource graph.

Fig. 15: Over Allocation in Task Sheet

Fig. 16: Over Allocation in Resource Sheet

4) Resources Re-Allocation

Then there are 2 features for removing the over allocation of resources such as resource leveling and redefining the resources. But if levelling feature is used activities has to be splitted and duration of activity has to be increased which increases project duration. So in this project redefining of resources method is adopted where resources are increased as shown in below figs

Fig. 17: Re-defining Resources in Resources Sheet

Fig. 18: Re-allocation of Resources in Task Sheet

H. Costing

Cost estimate of the project is carried out with the help of district schedule rates 2016-2017 Kalaburagi (north east zone) Karnataka, along with quantity survey, using which a detail estimate of cost of project is prepared which was collected, In MSP also we put the cost of each activity and this will in turn showcase cost of entire project by automatic calculation, so that it guides to see cost of any activity involved in the project

Task Mode	Task Name	WBS	Duration	Start	Finish	Predecessors	Cost
1	G+2 HOUSE @ HUMNABAD	1	286 days	Wed 3/1/17	Sun 12/24/17		₹ 8,179,409.92
2	SUBSTRUCTURE	1.1	50 days	Wed 3/1/17	Sat 4/22/17		₹ 522,696.64
3	FOUNDATION	1.1.A	12 days	Wed 3/1/17	Sun 3/12/17		₹ 226,834.28
4	setting out	1.1.A.1	1 day	Wed 3/1/17	Wed 3/1/17		₹ 0.00
5	footing & PB & FA excavation	1.1.A.2	1 day	Thu 3/2/17	Thu 3/2/17	4	₹ 5,189.00
6	leveling& pcc	1.1.A.3	1 day	Fri 3/3/17	Fri 3/3/17	5	₹ 34,725.60
7	column footing rebar tying and fixing	1.1.A.4	6 days	Sat 3/4/17	Thu 3/9/17	6	₹ 105,995.00
8	footing shuttering	1.1.A.5	4 days	Tue 3/7/17	Fri 3/10/17	7FS-3 days	₹ 8,085.00
9	footing concreting	1.1.A.6	1 day	Sat 3/11/17	Sat 3/11/17	8	₹ 72,839.68
10	footing desuttering and curing	1.1.A.7	1 day	Sun 3/12/17	Sun 3/12/17	9	₹ 0.00
11	COLUMNS UPTO PLINTH BEAM	1.1.B	12 days	Tue 3/14/17	Sat 3/25/17		₹ 31,941.82
12	column starter marking and fixing and concrete	1.1.B.1	1 day	Tue 3/14/17	Tue 3/14/17	10	₹ 0.00
13	column shuttering	1.1.B.2	3 days	Wed 3/15/17	Fri 3/17/17	12	₹ 10,980.00
14	column concreting	1.1.B.3	1 day	Sat 3/18/17	Sat 3/18/17	13	₹ 13,595.92
15	curing of column and footing	1.1.B.4	7 days	Sun 3/19/17	Sat 3/25/17	14	₹ 0.00
16	earth backfilling and consolidating	1.1.B.5	2 days	Sun 3/19/17	Mon 3/20/17	14	₹ 7,366.00
17	BASEMENT	1.1.C	10 days	Sun 3/26/17	Tue 4/4/17		₹ 36,220.42
18	basement wall	1.1.C.1	3 days	Sun 3/26/17	Tue 3/28/17	16	₹ 36,220.42
19	curing	1.1.C.2	7 days	Wed 3/29/17	Tue 4/4/17	18	₹ 0.00
20	PLINTH BEAM	1.1.D	16 days	Thu 4/6/17	Sat 4/22/17		₹ 227,702.00
21	shuttering	1.1.D.1	5 days	Thu 4/6/17	Mon 4/10/17	19	₹ 25,088.00
22	bar bending and fixing	1.1.D.2	5 days	Sat 4/8/17	Wed 4/12/17	21FS-3 days	₹ 62,350.00
23	concreting	1.1.D.3	1 day	Thu 4/13/17	Thu 4/13/17	22	₹ 73,824.00

Fig. 19: Task Sheet Showing Cost of Each Activity

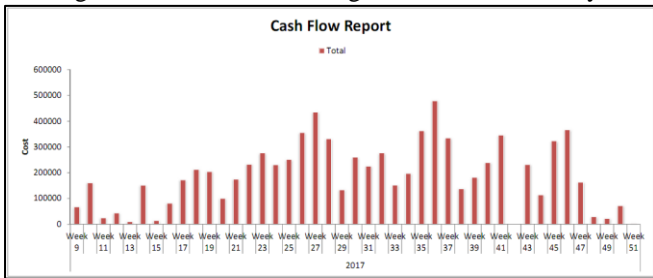


Fig. 20: Visual Report on Weekly Cash flow of the Project

V. CONCLUSIONS

The major conclusions drawn from this work are:

- 1) It is observed that, by using M.S Project 2010 a systematic analysis of planning, scheduling and resource management
- 2) The G+2 building is divided in 3 major tasks i.e. substructure, ground floor and first floor and second floor and all the activities involved in the major task are further divided to sub tasks so that all the activities involved in the project is carried out.
- 3) It gives clear picture of start and finish; the way activities are being performed, duration needed for every activity to get completed.
- 4) The project is planned to execute or finish for a time period of 281 days and the start of project is assumed as March 1st. 2017 and completion date is planned as December 19- 2017.
- 5) If at all any activity is delayed or the start date is postponed, we can easily change the schedule of that task and automatically entire project schedule get changes by itself. Hence it is very flexible and allows changes at any point of time.
- 6) Resources can be managed by contractor with help of resource graph.
- 7) Resources stored @ the site might lead to loss at some point of time, but by using MSP the resources can be purchased as and when i required.
- 8) For proper management of resources, in case of excess resources allocation an indication is provided.
- 9) The main aim of MSP Software is
 - Proper and efficient management of project
 - Planning and arranging of tasks.
 - To execute work in the allotted time period and budget.
- 10) We can extract weekly cash flow in the project which gives the cost needed on the weekly basis so that arrangement of money can be done, which avoids conflicts between owner and contractor

- 11) Contractor can manage the project efficiently and reduces difficulties to be faced in the project.

ACKNOWLEDGEMENT

The author is Grateful to the Department of Construction Technology, VTU CPGS, Regional office, Kalaburagi for existing facilities and support during study, and also very thankful to the project guide, lectures for their guidance and support.

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