

Analysis of Academic Building by Planning, Scheduling & Resource Allocation Using Oracle® Primavera P6

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ABSTRACT

The construction industry emphasizes vital part of a country's Infrastructure and modern construction. The construction industry is the second biggest industry in India still it's construction has been differential the country over. Here emerges the requirement for powerful Project management. Numerous issues are being confronted by the construction business, major of them are cost overwhelms and time invades because of lacking undertaking detailing, lack of foresight for usage and dishonorable management amid execution. Numerous Project Managers express that normal cost of the Project goes up by 30% as of the planned cost because of despicable Planning and scheduling. The first and foremost thing which we can get by effective planning in primavera is Start date of the project and Finish date of the project i'e Start date is 08 December 2016, and Finish date is 29 November 2017. Primavera P6 helps in effectively scheduling the project by assigning two relationships at a time to each activity and considerably reduces the float. Resources allocated to activities can be visually assessed for each activity & can be managed and reassigned at point of time.

Keywords: Planning, Scheduling, Resource allocation, Construction management, Oracle® Primavera P6

I. INTRODUCTION

The construction engineering emphasizes vital part of a country's Infrastructure and modern construction. The construction industry is the second biggest industry in India still it's construction has been differential the country over. There is an immense distinction of advancement in the provincial and urban territories. To adapt up to the status of advancement in urban territories the country areas require instruments for financial improvement, arrive utilize and condition Planning.

Here emerges the requirement for powerful Project management. Numerous issues are being confronted by the construction business, major of them are cost overwhelms and time invades because of lacking undertaking detailing, lack of foresight for usage and dishonourable management amid execution. Numerous Project Managers express that normal cost of the Project goes up by 30% as of the planned cost because of despicable Planning and scheduling.

The utilization of resources allotment in Project control is not another issue. Creation and operation grouping management is the way toward controlling generation and managements the fundamental goal of which is to match endeavours with the use of resources and types of gear so as to finest deliver and supply. Here resource allotment is extraordinary significance. It decides the sort resource allotment and significance of different specifications in view of the way of a generation framework and sum, sort and significance of resources. Building up an arrangement contrasts from building up a curriculum on the issue resource distribution in the project.

II. LITERATURE REVIEW

[1] Unmesh Polekar et. al (2015) author portray about construction Planning and testing activities in management work amid the execution. The Scheduling is accomplished for time management of every occasion or activities in the Project. The following is

accomplished for real Project performing esteem. In any case, it's a little private building having less activates. The significance of the Planning, scheduling and following of the private Project utilizing primavera is to know the correlation amongst plan and genuine executed calendar The essential issue experienced while executing a Project is an ascent in cost and augmentation in the finish time.

[2] **Sushant Pradhan et al. (2016)** has clarified companies in the past have confronted a considerable measure of issues particularly with regards to different activities. The information are over-burden, the cost has been overwhelm, the span is broadened and the resources have been over-designated. In this mode bringing about ill-advised project management. Thus this study fills in as a source of perspective while overseeing such sort of numerous activities. There are three locales considered and the work is been done at the same time. Planning and scheduling helps in future reference and execution of the project.

III. METHODOLOGY

A. Objectives

- To identify construction sequence for a Academic/School building construction.
- To work out the practical durations required to conduct the activities.
- To Schedule the various activities based on the total quantities of each activity.
- Precise manage of time till the end of Project.
- To allocate Resources for the various activities accordingly and adequately for better outcome.

B. Data Structure of Primavera

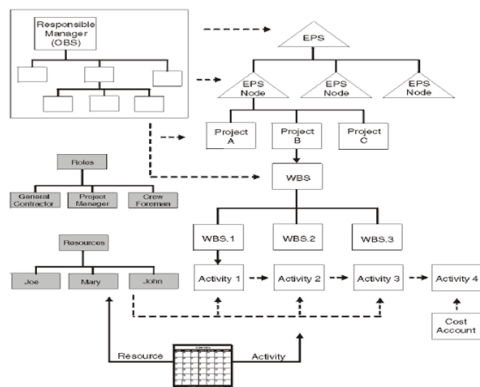


Figure 1. Figure showing data structure of primavera.

C. CPM Concept

The basic way through a planned system is the longest time span way through the system. "Critical" demonstrates that these errands can't be deferred in the general Project as the Project complete date is of incredible significance in the greater part of the tasks. As such, it is the way of the Project where both aggregate and free slack are zero for each basic assignment. This technique includes the utilization of a geometric portrayal of stream outline which delineates the priority between activities.

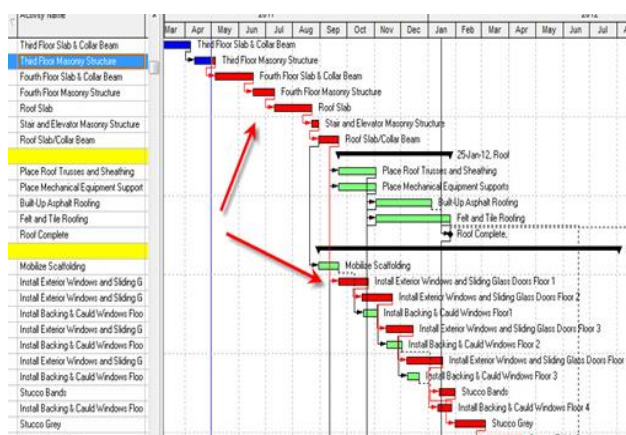


Figure 2. Figure Showing Critical Path in the Gantt Chart

D. Structuring of Project In Primavera P6

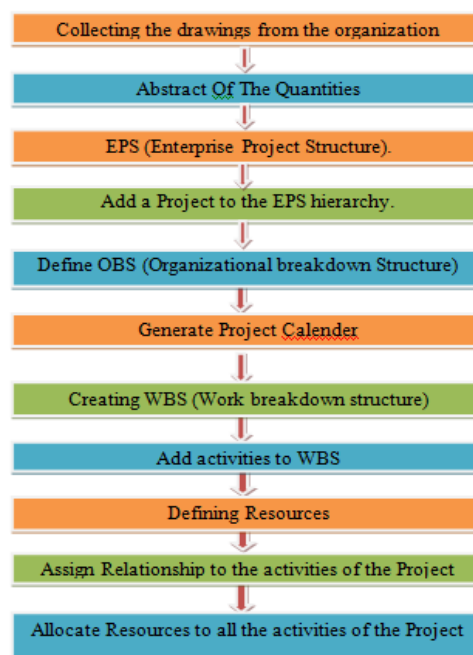


Figure 3. Figure showing structuring of project in primavera p6

1. Collecting the drawings.

The drawings pertaining to considered Project is gathered for the purpose of listing out of various activities involved in construction of particular structure. This will help to refer the drawings in case of any confusion related to data misleading and also help for the better data results pertaining to the end results of the study. Collection of drawings is the first and foremost part in data collection, this ensures an proper backup is maintained to reduce the confusions at any point of time and also help for the user to access the data whenever required at any sort of time.

2. Abstract of the Quantities

Abstract of Quantities is the quantity survey which is carried out before executing any task or any activity of the Project. Abstract of quantities includes the overall data of each activity involved in the construction of any Project considered. The quantities of each activity are worked out and this helps is setting out the original duration of the Project and hence this helps us to know the various resources required and various and we can effectively quantify them based upon the requirement. This proves to be effectively setting out of activities durations and according manages them with the best possible ways that a particular activity is handled. AOQ also determines a prominent role in cross verifying with the help of drawings available and helps to reduce the confusion and in turn saves times of the whole Project planning process.

3. Define EPS (Enterprise Project Structure)

Projects are organized in a pecking order called "Project extend structure". The EPS can be subdivided into the same number of levels or hubs as expected to parallel work in the association. Hubs at the most noteworthy or root level speak to divisions inside the organization, next level hubs speak to Zones, then Regional Offices, then Construction Supervisors, then development contracts; or they could be by other real groupings that reflect how or by whom Projects are assigned and entrusted.

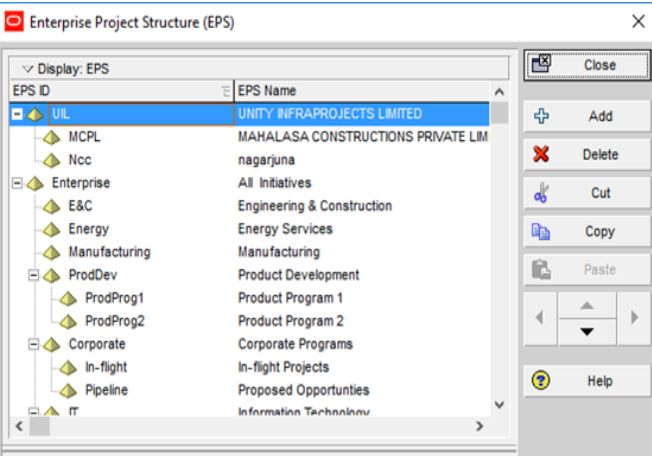


Figure 4. Figure showing Enterprise Project Structure

4. Addition of Project to the E.P.S hierarchy.

We can sort out boundless number of Projects in EPS

Projects			
Resources Activities WBS Projects			
Layout: Projects			
Project ID	Project Name	Total Activities	Strategic Priority
UIL	UNITY INFRAPROJECTS LIMITED	102	500
MCPL	MAHALASA CONSTRUCTIONS PRIVATE I	102	500
CUK	CENTRAL UNIVERSITY OF KARNATAKA	0	500
CUK1	CENTRAL UNIVERSITY OF KARNATAKA.1	102	500
Nec	nagarjuna	0	500
Enterprise	All Initiatives	2254	
HL-1	HOUSING PROJECT PHASE IX	0	
E&C	Engineering & Construction	608	500
AC1	CUK	0	500
EC00501	Hallang Corporate Park	71	100
EC00515	City Center Office Building Addition	71	100
EC00530	Neebid Building Expansion	71	100
EC00610	Harbour Pointe Assisted Living Center	131	100
EC00620	Juniper Nursing Home	132	100
EC00630	Saratoga Senior Community	132	100

Figure 5. Figure showing E.P.S hierarchy

5. Define OBS (Organizational breakdown structure)

The authoritative breakdown structure (OBS) is a worldwide pecking order that speaks to the directors in charge of the Projects in big business. The OBS more often than not mirrors the organization arrangement of association, from top-level faculty downward through different levels constituting your business. Connect dependable administrators with their regions of E.P.S both hubs/individual Projects. Connect the dependable directors with their territories of the endeavour extend structure with either an EPS hub or a Project. When you connect a dependable administrator with an EPS hub, any activities you add to that branch of the EPS are doled out that chief component of course. An OBS underpins expansive tasks that include a few Project directors with various regions of obligation.

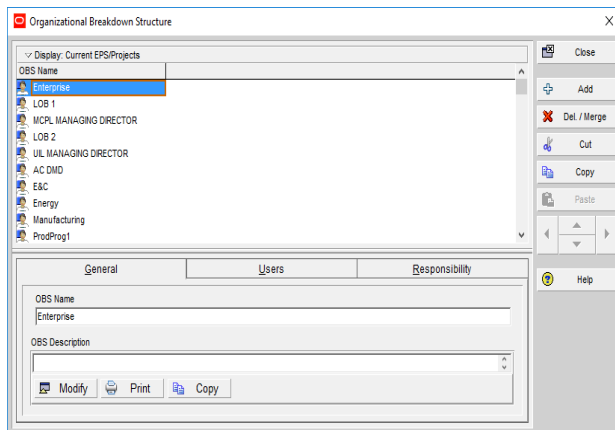


Figure 6. Figure Showing OBS

6. Generate Project Calendar

Make and dole out schedules to every resource and every action. These schedules characterize the accessible work-hours in each logbook day(Figure.3.3). Additionally indicate national occasions, association's occasions, extend particular working or non-working days, and source get-away day. Date-book course work be utilized for movement planning, following, &resource levelling.

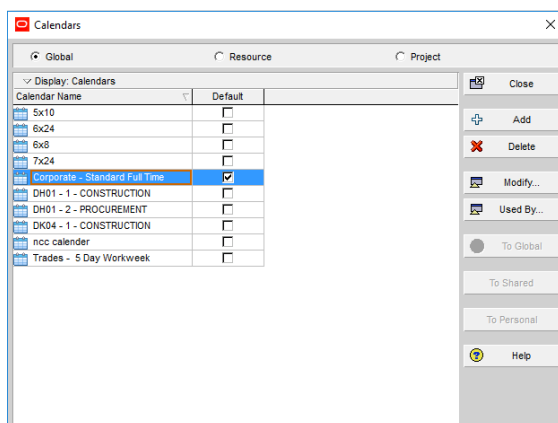


Figure 7. Figure Showing Project Calendar

7. Creating W.B.S (Work breakdown structure)

A W.B.S is pecking order of working that should be expert to complete a mission, which characterizes an item/management be delivered. The W.B.S organized in levels of job feature, starting with the submitted itself,& is afterward isolated into identifiable work elements. W.B.S is a various levelled course of action of the items and managements created amid and by the Project. The Project is the most elevated amount while an individual

movement (or an activity thing) to make an item or management is at the least level

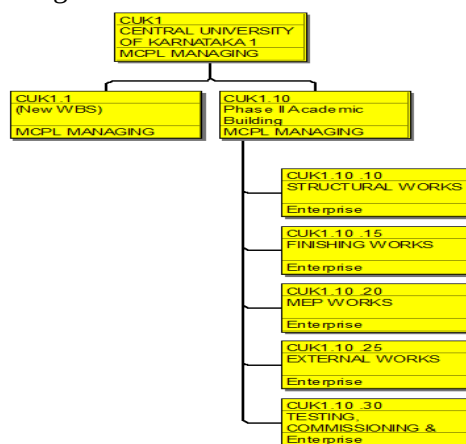


Figure 8. Figure Showing WBS

8. Add Activities to WBS

Otherwise called Projects, Events, or work bundles, activities are the least level sensible work components in a Project or WBS Activities regularly have expected spans, expenses, and resource or part prerequisites. Point of reference activities, be that as it may, have no length or cost. On the whole, all activities frame the establishment of the whole Project, driving resource assignments, connections, limitations, costs, and lengths. Activities are in some cases additionally partitioned into any number of discrete strides.

CUK1 CENTRAL UNIVERSITY OF KARNATAKA 1		255	255	08-Dec-16
CUK1.1 (New WBS)		0	0	
CUK1.10 Phase II Academic Building		255	255	08-Dec-16
CUK1.10.10 STRUCTURAL WORKS		131	131	08-Dec-16
CUK1.10.10.10 SUB STRUCTURE		66	66	08-Dec-16
CUK1.10.10.10.10 Upto Plinth Beam		66	66	08-Dec-16
CUKHCONP1A21STUG1000 Footing Excavation		14	14	08-Dec-16
CUKHCONP1A21STUG1005 Footing Antitemite		14	14	09-Dec-16
CUKHCONP1A21STUG1010 Footing Blinding		9	9	20-Dec-16
CUKHCONP1A21STUG1020 Construction of footing		26	26	29-Dec-16
CUKHCONP1A21STUG1025 Construction of neck of columns		17	17	23-Jan-17
CUKHCONP1A21STUG1030 Construction of Plinth Beams		15	15	13-Feb-17
CUKHCONP1A21STUG1035 Backfilling Upto Plinth Beam		16	16	15-Feb-17

Figure 9. Figure showing adding of activities to WBS

9. Defining Resources

A resource is any quantifiable thing in constrained supply and of adequate incentive to legitimize following and allocating to particular activities for a Project. Resources incorporate general or concentrated work, non-work things, for example, hardware, and material

CENTRAL UNIVERSITY OF KARNATAKA 1		Current Project's Resources		10-Jun-17 13:45
Resource ID	Resource Name	Resource Type	Unit of Measure	Default Units / Time
 Q601	EXCAVATION QTY	Material	CUBIC METER	8CUM/d
 Q602	BUNDING QTY	Material	CUBIC METER	8CUM/d
 Q610	Brickwork QTY	Material	CUBIC METER	8CUM/d
 Q606	CONCRETE QTY	Material	CUBIC METER	8CUM/d
 Q608	BACKFILLING QTY	Material	CUBIC METER	8CUM/d
 Q650	SWEET SOIL QTY	Material	CUBIC METER	8CUM/d
 Q718	ANTITERMITE QTY	Material	Square Mete	8SQMT/d
 E203	BOBCAT	Nonlabor		8Std
 E212	TRUCK	Nonlabor		8Std
 EQ0P	EQUIP OPERATORS	Labor		8Std
 E208	LOADER	Nonlabor		8Std
 E209	PLATE COMPACTOR	Nonlabor		8Std
 E210	POCLAIN	Nonlabor		8Std
 J305	CARPENTERS SK	Labor		8Std
 J306	CONCRETE MASON SK	Labor		8Std
 J302	BUNDING MASON SK	Labor		8Std
 J303	SCREED MASON SK	Labor		8Std
 J304	STEEL FIXERS SK	Labor		8Std
 J311	MANHOLES SK	Labor		8Std
 J312	KERBSTONE MASON SK	Labor		8Std
 J313	INTERLOCK MASON SK	Labor		8Std
 LC30	LABOR - CIVIL	Labor		8Std

10. Assign Relationship to the activities of the Project

10.1 Finish to Start (FS)

10.2 Start to Start (SS)

10.3 Finish to Finish (FF)

10.4 Start to Finish (SF)

Layout: Classic Schedule Layout

Filter: All Activities

Activity ID	Activity Name	Original Duration	Critical	Activity Type
LOE Level of Effort		15d		
A1000	Excavate	5d	☒	Task Dependent
A1010	Drill	5d	☒	Task Dependent
A1020	Build	5d	☒	Task Dependent
P1000	Project Management	15d	☐	Level of Effort

October 2013

November

06 13 20 27 03 10

30-Oct-13, L

Excavate

Drill

Build

Project Manag

General Status Relationships Resources

Activity P1000

Project Management

Predecessors

Activity ID	Activity Name	Relations	Lag
A1000	Excavate	SS	0d

Successors

Activity ID	Activity Name	Relations	Lag
A1020	Build	FF	0d

11. Allocate the Resources to every one of the activities of the Project

7	CUK1.10.10.10 SUB STRUCTURE	66	65/09-Dec-16
8	CUK1.10.10.10.10 Upto Plinth Beam <td>66</td> <td>66/09-Dec-16</td>	66	66/09-Dec-16
9	CUKHCONPIAZISTUG1000 Footing Excavation <td>14</td> <td>14/09-Dec-16</td>	14	14/09-Dec-16
10	CUKHCONPIAZISTUG1005 Footing Antitermite <td>14</td> <td>14/09-Dec-16</td>	14	14/09-Dec-16
11	CUKHCONPIAZISTUG1010 Footing Blinding <td>9</td> <td>9/20-Dec-16</td>	9	9/20-Dec-16
12	CUKHCONPIAZISTUG1020 Construction of footing <td>26</td> <td>26/20-Dec-16</td>	26	26/20-Dec-16
13	CUKHCONPIAZISTUG1025 Construction of neck of columns <td>17</td> <td>17/23-Jan-17</td>	17	17/23-Jan-17
14	CUKHCONPIAZISTUG1030 Construction of Plinth Beams <td>15</td> <td>15/13-Feb-17</td>	15	15/13-Feb-17
15	CUKHCONPIAZISTUG1035 Backfilling Upto Plinth Beam <td>16</td> <td>15/15-Feb-17</td>	16	15/15-Feb-17
16	CUKHCONPIAZISTUG1050 Floor Plain Cement Concrete <td>16</td> <td>16/16-Feb-17</td>	16	16/16-Feb-17
17	CUK1.10.10.15 SUPERSTRUCTURE <td>71</td> <td>71/02-Mar-17</td>	71	71/02-Mar-17

General	Status	Resources	Codes	Relationships	Notebook	Steps	Feedback	Risks	Expenses	Summary
Activity		CUKHCONPIAZISTUG1025 Construction of neck of columns								
Resource ID Name	Primary Resource	Resource Type	Remaining Units / Time	original Lag	Start	Finish	Bud			
J305 CARPENTERS SK	☐	Labor	40hId	0	23-Jan-17	14-Feb-17				
J306 CONCRETE MASON SK	☐	Labor	2hId	0	23-Jan-17	14-Feb-17				
Q606 CONCRETE QTY	☐	Material	2CUmId	0	23-Jan-17	14-Feb-17				
Q605 FORMWORK QTY	☐	Material	19SQmId	0	23-Jan-17	14-Feb-17				
LC30 LABOR - CIVIL	☐	Labor	29hId	0	23-Jan-17	27-Feb-17				
Q604 REINFORCEMENT BARS QT	☐	Material	125KGId	0	23-Jan-17	24-Feb-17				
J304 STEEL FIXERS SK	☒	Labor	16hId	0	23-Jan-17	14-Feb-17				

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E. Productivity Constants

Items	Productivity /Day	UOM	Skilled Labour	Ratio of Un Skilled
ANTITERMITE	20	SQM	ANTITERMITE SK	0.375
BLINDING	10	SQM	BLINDING MASON SK	0.750
SCREED	10	SQM	SCREED MASON SK	0.375
REINFORCEMENT BARS	100	KGS	STEEL FIXERS SK	0.750
FORMWORK	4	SQM	CARPENTERS SK	0.750
CONCRETE	4	CUM	CONCRETE MASON SK	0.750
WATERPROOFING	10	SQM	WATERPROOFING SPECIALIST SK	0.375
WELDED WIRE MESH	30	SQM	STEEL FIXERS SK	0.750
BLOCK	4	SQM	BLOCK MASON SK	0.560
PLASTER	5	SQM	PLASTER MASON SK	0.560
FLOORING SCREED	10	SQM	SCREED MASON SK	0.375
WET AREA WATERPROOFING	10	SQM	WATERPROOFING SPECIALIST SK	0.375
FIRST COAT PAINT	10	SQM	PAINTERS SK	0.375
CERAMIC WALL TILE	4	SQM	TILE MASON SK	0.560
PORCELAIN FLOORING	7	SQM	TILE MASON SK	0.560
COBBLE STONE	5	SQM	TILE MASON SK	0.560
SLATE TILE	5	SQM	TILE MASON SK	0.560
GRANITE	2	SQM	GRANITE MASON SK	0.560

Figure 13. Figure Showing Resource Allocation

F. Calculation For Original Duration And Resource Allocation

Note

Total Working Hours in a day = 8 Hours.

Total Working Days in a Week = 6 Days.

1. Footing Excavation

Total Quantity of earth work in excavation = 1197.65 m^3

Excavator Efficiency = 200 Cubic feet per hour
= 200×8

= 1600 Cubic feet per day

= $1600/35.28$

= $45.25 \text{ m}^3/\text{day}$

Now, No of days = Total Quantity/ Excavator Efficiency
= $1197.65/45.25$
= 27 Days

No of Excavators available = 2

Original Duration = $27/2$

= 14 Days

No of hours = 14×8

= 112 hours

Resources

Excavator = $112 \times 2 = 224 \text{ hrs}$

Dumper = 224 hrs

Loader = 224 hrs

Equipment Operators = 224×3

= 672 hrs

Labor = 112 hrs

4.3.2 Footing Antitermite

Footing Antitermite total Quantity = 536 m^2

Productivity Per Day (1 Mason) = 20 m^2

2 Masons Employed Per Day

Now, No of days = Total Quantity/ Productivity Each Day

= $536/2 \times 20$

= 14 Days

Now, Antitermite Skilled (Mason) = $2 \times \text{Days} \times \text{hrs/day}$

= $2 \times 14 \times 8$

= 224 hrs

Labour Hours (Unskilled) = 224×0.375

= 84 hrs.

G. Calculations for Relationship Lag/Lead.

Note,

Mostly Used Relationships are:

START to START

FINISH to FINISH

Excavation total quantity = 1197.65 m^3

Excavation depth is up to 1.5 m

Now, excavation quantity = $1197.65/1.5$

= 799 m^2

Antitermite total quantity = 536 m^2

Now, excavation quantity per day = $799/14 = 57 \text{ m}^2$

antitermite quantity per day = $536/14 = 38.28 \text{ m}^2$

Trial 1. with one day lag

Excavation Quantities

57	114	171	228	285	342	399	456	513	570	627	684	741	799	FF1
SS1	38.2	76.56	114.54	153.12	191.4	229	267.96	306	344.5	382	421	459	497	535

Antitermite Quantities

Hence Trial 1. is satisfied

Now, START to START = 1 day lag.

FINISH to FINISH = 1 day lag.

IV. RESULTS AND INTERPRETATION

A. Planning

- The Total number of activities = 137
- Total No. of Resource types defined and used = 70 (Including Manpower, Machinery and Materials)
- Project Start Date is 08 December 2016
- Project Finish Date is 29 November 2017

CENTRAL UNIVERSITY OF KARNATAKA 1			Classic Schedule Layout		19-Jun-17 21:58	
#	Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
1	CUK1 CENTRAL UNIVERSITY OF KARNATAKA		255	255	09-Dec-16	29-Nov-17
2	CUK1.1 (New WBS)		0	0		
3	CUK1.10 Phase II Academic Building		255	255	08-Dec-16	29-Nov-17
4	CUKCONP2SD1000	PROJECT START DATE	0	0	08-Dec-16	
5	CUKCONP2SD1010	PROJECT FINISH DATE	0	0		29-Nov-17
6	CUK1.10.10 STRUCTURAL WORKS		131	131	08-Dec-16	08-Jun-17
7	CUK1.10.10.10 SUB STRUCTURE		66	66	08-Dec-16	09-Mar-17
8	CUK1.10.10.10.10 Upto Plinth Beam		66	66	08-Dec-16	09-Mar-17
9	CUKHCONPIAZ1STUG1000	Footing Excavation	14	14	08-Dec-16	27-Dec-16
10	CUKHCONPIAZ1STUG1005	Footing Antitermite	14	14	08-Dec-16	28-Dec-16
11	CUKHCONPIAZ1STUG1010	Footing Blinding	9	9	20-Dec-16	30-Dec-16
12	CUKHCONPIAZ1STUG1020	Construction of footing	26	26	29-Dec-16	02-Feb-17
13	CUKHCONPIAZ1STUG1025	Construction of neck of column	17	17	23-Jan-17	14-Feb-17
14	CUKHCONPIAZ1STUG1030	Construction of Plinth Beams	15	15	13-Feb-17	03-Mar-17
15	CUKHCONPIAZ1STUG1035	Backfilling Upto Plinth Beam	16	16	15-Feb-17	08-Mar-17
16	CUKHCONPIAZ1STUG1050	Floor Plain Cement Concrete	16	16	16-Feb-17	09-Mar-17
17	CUK1.10.10.15 SUPERSTRUCTURE		71	71	02-Mar-17	08-Jun-17
18	CUK1.10.10.15.10 GROUND FLOOR		37	37	02-Mar-17	21-Apr-17
19	CUKHCONPIAZ1STGF2000	Column-Rebar & Formwork	26	26	02-Mar-17	06-Apr-17
20	CUKHCONPIAZ1STGF2005	Column-Concrete	19	19	14-Mar-17	07-Apr-17
21	CUKHCONPIAZ1STGF2010	Beam, Stairs, Slab-Rebar &	26	26	16-Mar-17	20-Apr-17
22	CUKHCONPIAZ1STGF2015	Beam, Stairs, Slab-Concrete	21	21	24-Mar-17	21-Apr-17
23	CUK1.10.10.15.15 FIRST FLOORS		33	33	03-Apr-17	17-May-17
24	CUKHCONPIAZ1STFF2020	Column-Rebar & Formwork	23	23	03-Apr-17	03-May-17
25	CUKHCONPIAZ1STFF2025	Column-Concrete	18	18	12-Apr-17	05-May-17
26	CUKHCONPIAZ1STFF2030	Beam, Stairs, Slab-Rebar &	23	23	13-Apr-17	15-May-17
27	CUKHCONPIAZ1STFF2035	Beam, Stairs, Slab-Concrete	19	19	21-Apr-17	17-May-17

Figure 15. Figure showing sequence of activities

B. Scheduling

Scheduling is assurance the planning of occasions in scheme that is while and which undertaking will be perform? Placing it within straightforward terms it is an impression of plan. At the end of the day we can state, arranging is How, What and Who though planning is when and why. Scheduling can be likewise characterized as the definite arrangement of the Project work errands as for time.

Activity ID	Activity Name	Original Duration	Remaining Duration	Start	Finish
CUK1.10.10.10.10 Upto Plinth Beam		66	66	08-Dec-16	09-Mar-17
CUKHCONPIAZ1STUG1000	Footing Excavation	14	14	08-Dec-16	27-Dec-16
CUKHCONPIAZ1STUG1005	Footing Antitermite	14	14	08-Dec-16	28-Dec-16
CUKHCONPIAZ1STUG1010	Footing Blinding	9	9	20-Dec-16	30-Dec-16
CUKHCONPIAZ1STUG1020	Construction of footing	26	26	29-Dec-16	02-Feb-17
CUKHCONPIAZ1STUG1025	Construction of neck of column	17	17	23-Jan-17	14-Feb-17
CUKHCONPIAZ1STUG1030	Construction of Plinth Beams	15	15	13-Feb-17	03-Mar-17
CUKHCONPIAZ1STUG1035	Backfilling Upto Plinth Beam	16	16	15-Feb-17	08-Mar-17
CUKHCONPIAZ1STUG1050	Floor Plain Cement Concrete	16	16	16-Feb-17	09-Mar-17
CUK1.10.10.15 SUPERSTRUCTURE		71	71	02-Mar-17	08-Jun-17
CUK1.10.10.15.10 GROUND FLOOR		37	37	02-Mar-17	21-Apr-17

Figure 15. Figure showing scheduled activities

C. Resource Allocation

Subsequent to planning the activities the resource sheet is readied and they are allotted in every movement. The resources in the software is separated in the process of childbirth, non-work and material

Resource ID Name	Primary Resource	Resource Type	Remaining Units / Time	Original Lag	Start	Finish
1305 CARPENTERS SK		Labor	40h/d	0	23-Jan-17	14-Feb-17
1306 CONCRETE MASON SK		Labor	2h/d	0	23-Jan-17	14-Feb-17
Q606 CONCRETE QTY		Material	2CUM/d	0	23-Jan-17	14-Feb-17
Q605 FORMWORK QTY		Material	19SQM/d	0	23-Jan-17	14-Feb-17
LC30 LABOR - CIVIL		Labor	29h/d	0	23-Jan-17	27-Feb-17
Q604 REINFORCEMENT BARS QT		Material	125KG/d	0	23-Jan-17	24-Feb-17
1304 STEEL FIXERS SK		Labor	16h/d	0	23-Jan-17	14-Feb-17

Figure 16. Figure showing resource allocation to activities

D. Resource Histograms

The resource histogram is a device that is often used by the Project management team and or as a means of providing a pictorial representation to the team and to all of those interested parties. Exactly speaking, the resource histogram is exactly a bar chart that is cast-off for the purposes of exhibiting the specific sums of time that a particular resource is scheduled to be operated on over a predetermined and specific time period. Resource histograms may also contain the qualified feature of resource availability, used for evaluation on for devotions of contrast.

1. Labour Histogram and S- Curve

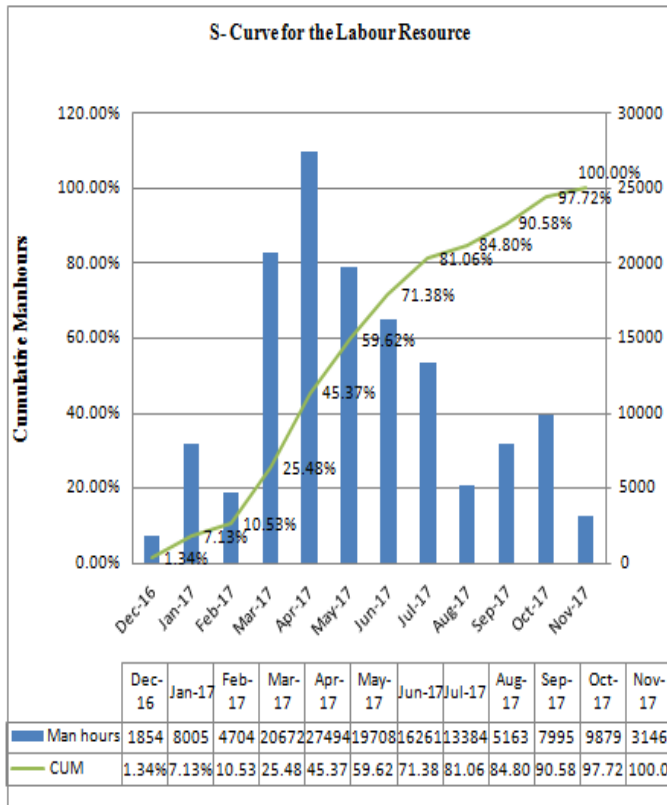


Chart 1: Labor Histogram and S- Curve

- S-Curve represents the flow of resources against time.
- The highest number of labor hours is interpreted in April 2017
- This signifies the highest amount of labor resource is used in the month of April 2017.
- This helps for planning for the resource well in advance for the peak month resource requirement.

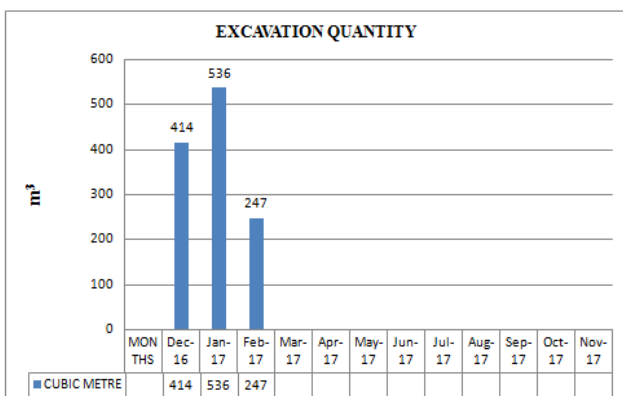


Chart 2: Resource Histogram for Excavation Quantity

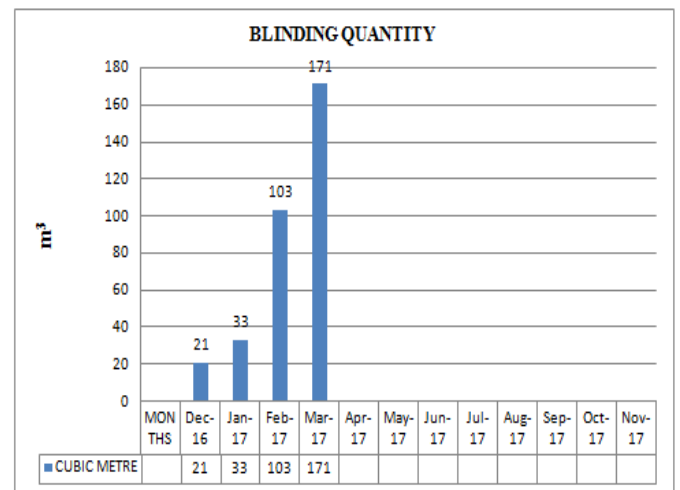


Chart 3: Resource Histogram for Blinding Quantity.

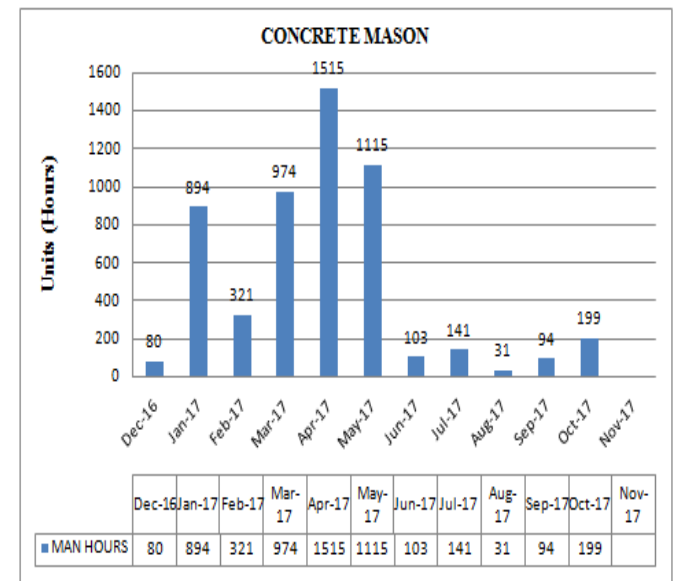


Chart 4: Resource Histogram for Concrete Mason

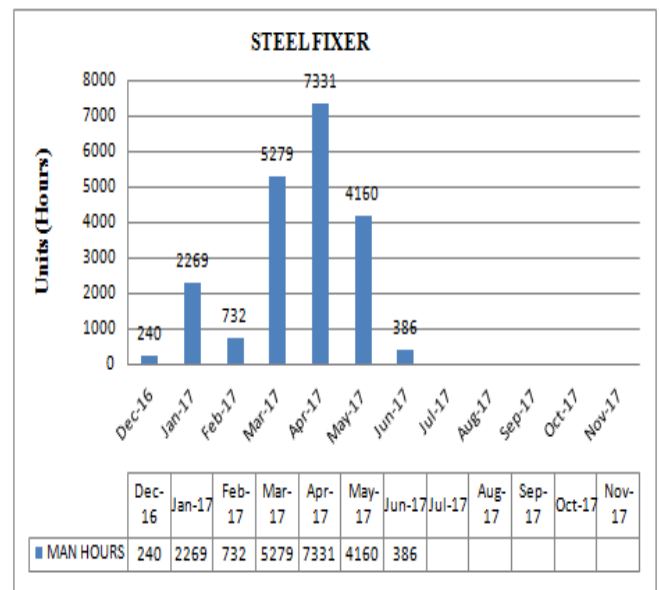


Chart 5: Resource Histogram for Steel Fixer

V. CONCLUSION

- ✓ The first and foremost thing which we can get by effective planning in primavera is Start date of the project and Finish date of the project i.e Start date is 08 December 2016, And Finish date is 29 November 2017.
- ✓ Primavera P6 helps in effectively scheduling the project by assigning two relationships at a time to each activity and considerably reduces the float.
- ✓ Resources allocated to activities can be visually assessed for each activity & can be managed and reassigned at point of time.
- ✓ The multiple resources required for the each activity can be allocated in effectively may it be in the form at Manpower, Machinery or Material.
- ✓ The S-Curve lets us know the flow of resources against time and lets us to manage the resources accordingly.
- ✓ Resource Histograms Show the Peak months for the each resource and lets us to plan in advance for the quantity of resource required to accomplish the task or an activity.
- ✓ Resource Histograms lets us to know that a particular resource is in need for a particular month or a duration of time, Later the resource is freed up or allocated at different working location
- ✓ Resource Histograms give the information about the Daily, monthly or yearly payments need to be made for each resource may it be Manpower, Machinery or Material.
- ✓ Overall, Precise manage of time till the end of Project.

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