

SCHEDULING OF BUILDING USING PROJECT MANAGEMENT SOFTWARE PRIMAVERA P6

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Abstract: Oracle Primavera P6 is a project management software that is used for planning, managing and executing project work. It provides solution to entire project cycle starting from project initiation, planning, execution, controlling, evaluating and closure. Effective use of this tool increases the reliability and profitability of any organization. The construction world is growing day by day and it is also experiencing delay problem in projects. There is need of better plan to execute these larger and complex projects. Primavera is the solution for this. The main objective of this project is to use a project management software Primavera P6 for scheduling of the ongoing as well as residential buildings located in and near Shirpur, district Dhule. Data required for the scheduling is collected from the contractor and software is studied. Various literatures from international journals were studied to understand it effectively. EPS, OBS, WBS, activities, calendar, baselines, etc. are the different elements of the primavera software. Based on data obtained network diagram is prepared and relations are assigned between the activities to calculate the critical path and the total duration of project is calculated by primavera. Three baselines are used in ongoing project. Baseline 1, Baseline 2 and Baseline 3 is shown by the yellow solid color, red hatch and violet cross pattern respectively. Baseline is maintained and it is then assigned to the project. Once any critical activity takes more time than its schedule time Baseline 2 is created. In this residential building of ongoing construction project manual method is used because project is not going exactly as baseline plan. Status of the project is updated by entering actual start date and end date of the project. After the delay primavera automatically shifts the date of the project. Primavera P6 results into the effective planning and scheduling of the project. It helps to understand and forecast the progress of the construction project. From the study of primavera it is concluded that the total duration of the project as per primavera software is calculated and estimated duration is reduced when the project plan is followed as per software scheduling.

Key Words - scheduling, planning, primavera software, Gantt chart, baselines.

1. INTRODUCTION

The project scheduling plan is the main plan in every project management strategy. Common problems with building projects include delayed tasks and spending more than estimated. Effective project planning and management will ensure successful construction project outcomes. The project schedule connects the time line with the tasks. To complete each work that has been set on time, the project team requires a tool that can be used to plan, schedule, and manage the project's activities. Tools for project management like Oracle Primavera P6 are used to plan, manage, and carry out work of projects. It can be used to manage projects of any size, from small to complex and large-scale. In industries including manufacturing, energy, oil & gas, information technology and construction, it is used all over the world.

Primavera enables the breakdown of complex tasks into simpler, smaller ones. The critical path method (CPM) is used by Primavera P6 to organize project activities. It offers solutions for every stage of the project lifecycle, including initial planning, execution, control, evaluation, and closing. Any organization's efficiency and profitability are increased by effective use of this tool. Activities can be filtered, sorted, and categorized. It becomes easy to monitor and visualize project performance compared to the original plan.

The construction world is growing day by day and it is also experiencing delay problem in project work. There is need of better planning for these larger and complex projects. There are many reasons for the delay of the project such as lack of proper care, natural causes like rain and mistakes by contractor.

It can be quite challenging for the project manager to monitor and manage the root of schedule inefficiency. Proper software for the project management should be chosen for effective and efficient project planning. Primavera P6 is the most commonly used project management software in Indian construction industry. It can be used as a standalone tool or as web based.

2. OBJECTIVES:

- 1) To study the project "scheduling of residential building using project management software Primavera P6" by using journals & literatures.
- 2) To study the project management software, Oracle Primavera P6.
- 3) To use primavera software for the execution of ongoing as well as completed project of building construction.

4) To compute the total duration of project using primavera and compare it with estimated duration.

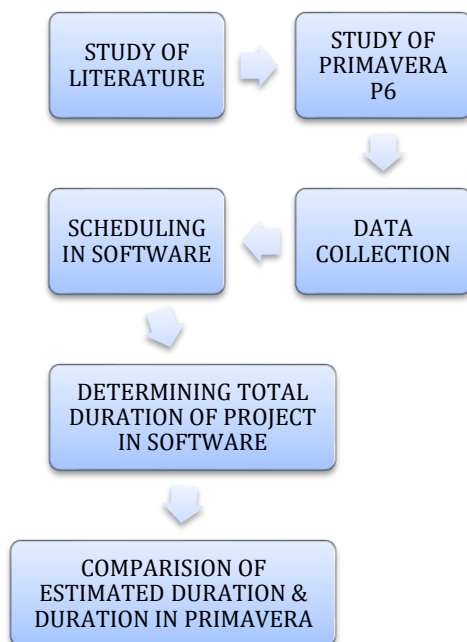
3. STUDY AREA OF THE PROJECT:

The scheduling and planning of a residential building project is done in project management software. The purpose of the project is to schedule a residential building construction activities with help of primavera P6 PPM (Professional Project Management).

Ten building sites and one ongoing or in progress residential building site are taken for the project to study and schedule in project management software P6.

First ten building of residential building project are chosen to study, understand and find out total duration of project and is compared with its original completed duration. For ongoing construction building, schedule is prepared in software & its duration is calculated using same and is compared with the estimated duration. As scheduling and planning project manually can be troublesome to the engineer, so to reduce drawbacks of it, primavera software is used.

4. METHODOLOGY



4.1. STUDY OF LITERATURE:

Pravinkumar Jagtap et al (2022) [1] have studied Planning, Scheduling, Budgeting and Tracking of a Multi-Storey Building Using Primavera P6. The main goal and the mission of the study was to learn and analyze of Planning and Management of the residential building with timely accomplishment of any construction project. To reach the objectives of the project author collected data of a building for creating schedule and computed total duration of project

using primavera p6 software. The project completion date and total duration of the project according to the planned schedule is 15 Apr-2024 and 749 days respectively. Total of 281 activities are involved with this project from its initiation to delivery. It shows the critical activities and path which helps to keep more focus on them to avoid schedule overrun.

Mr. S. V. Siva Raju et al (2021) [2] have used primavera software for Planning, Analysis and Construction Controlling of G+5 Building. Objective of this study was to understand the role of monitoring and control in the progress and timely completion of the project. The scheduling of the project which is G+5 building is done in the software and calendar Corporate-Standard Full Time is assigned to the project work. Author created different WBS structure according to the need of the project like substructure superstructure and superstructure were subdivided into 1st floor, 2nd floor, 3rd floor, 4th floor and 5th floor. The objective of the study was reach by studying literatures and journal papers. Methodologies involved helped in understanding the project's progress and problems coming while executing the project activities were identified. Results of this study shows the drawbacks of the present project management system in running project effective new project management plan using project management software which is primavera p6 is brought to conclusion.

Hansashree Govindrao Pawar & Mithil Prasad Shirke (2021) [3] have studied Scheduling and Estimation of Residential Structures using Primavera. Primavera is tool is applied for the planning, scheduling and resource allocation for the G+4 building construction project. Project schedule was prepared by the author with all the activities of project with proper sequence and assigning relationships to the activities and resources were assigned. The human resources then increased in number thereby reducing duration of each activity. The data required such as drawings were collected from Mumbai and nearby region for the development of successful estimation and scheduling purpose. The total duration of the G+4 building project is 456 days with a total of 288 activities were in the project is calculated by using primavera software. By doing the project conclusion of the project drawn by author is primavera is effective tool in handling projects schedule. Total duration and critical path were identified in it. With the help of gannt chart it is easy to track the project. User can further update their project in primavera software.

Rajat & Masoom Reza (2020) [4] has studied Time and Cost management using Primavera P6 in Construction Building. The objective of the research paperwork is to schedule the residential building construction using primavera p6 and to determine the critical activities which can cause the delay of project or successor activities. Methodologies like collection of literature and data, selection of project, planning and monitoring of project and complete project observation were adapted to complete goal. The project work selected is located at Golf Link, New Delhi. In this paper, the result was observed that the reasons for the delay of the project were bad planning and financial shortness. Conclusion of this research paper were brought by the author as, to reduce the cost of

project must be completed in time. By selecting and using proper planning and management software or tool one can reduce duration as well as the cost of the project. Contractor must ensure to complete activities in time as per planned in software.

Meghana Kadiyala et al (2020) [5] have studied Planning and Scheduling of a Multi-Storey Building Using Primavera P6. The objectives of this study are to identify the scheduling techniques used by the organization in developing plan and scheduling and to compute the practical durations required to carry out the activities and to identify the construction sequence. In this project work author used the primavera P6 software to schedule the activities. Project is under the enterprise project structure named L & T enterprise and created enterprise OBS under which comes project manager, general manager, sales manager, E & C, energy and manufacturing. Author created WBS structure according to project work and defined relationships between the activities. By scheduling and updating the project work in primavera, author was able to find the total duration of the project work, linking of the activities, determined the critical path and tracking of on-site project is done. The project has been completed in an efficient manner with the understanding of proper scheduling using Primavera P6 software.

K. Suresh Kannan (2019) [6] has studied the Planning and Scheduling Residential Building Using Primavera Software. Planning and scheduling of the two stored building is done in primavera p6 software. The objectives of the study are to find the sequence of the project in project management software, to find out the total duration using primavera, to prepare proper planning and scheduling of the residential building using primavera software and to monitor the project progress and work done according to schedule created in software. The goals were reached by following methodologies like creating schedule and assigning relations between activities. Data collected was of two storied residential building. The construction start date and end date was 21 July 2017 and 21 December 2017 respectively. The contract period of the project was 5 months. Total days required to complete the project estimated by the contractor were 243 days and the duration calculated by primavera was 209 days. Thus the optimization of the project is done with help of software.

Anurag Mahure & Amit Kumar Ranit (2018) [7] have studied project management of 200 trainee hostel building by using primavera software. The main objective of the author to study it was to create a schedule for building construction and follow it by using software. The aim and goal of the project was reach by methodology like creating the schedule in primavera and finding out its start and end date. The project is located at the campus of Dr. Panjabrao, Deshmukh Prabodhini Amravati. The contract period of project construction was 24 months. Result of project work is that the time duration of project was reduced by nearly 3 months by an implementation of planning and scheduling using primavera software. The proper planning and scheduling done software will reduce the duration and there will be ease of handling the activities with the help of Gantt chart.

Fathima Zerine T & Angela C. Joy (2018) [8] have studied the Construction Management Using Primavera. Authors study proved to be a guideline in understanding the progress of construction work and to identify the specific problems arising during the process. Main objective of this study was to complete the work in time and to provide better working conditions and environment condition to workers. Author adapted different methodologies and project is done accordingly to achieve the objectives of the project. Author assigned EBS, OBS, and WBS to the project as per requirement. Results of this study show the drawbacks of the present project management system in running project. An efficient and cost-effective new project management plan is brought to conclusion.

Vishal Annappa Nimbale & Prof. Balasaheb Jamadar (2017) [9] had studied Planning Scheduling and Allocation of resources for Multi-storied structure using Oracle's Primavera P6 software. The main aim and goal of this study was to know role of scheduling, planning, monitoring and controlling project progress by completing it in time by following the scheduling done in primavera p6 software. Author created the project in the software primavera p6 and assigned the activity relationship so that it will be easier to user to follow schedule from Gantt chart. The project completion date was 7 December 2018 according to project planned and its estimated duration was 640 days that is 21.5 months. Hence there is reduction in the duration of the project when it is done according to schedule created in primavera software. 348 activities in total were there in the project schedule. The project was tracked, monitored and updated. The project helped in comparison of the baselines created with the revised schedule.

Raj Saran et al (2016) [10] have studied Planning and Scheduling of a Two Stored Building Using Primavera P6. Objectives of this study are to find the construction sequence of a residential building construction, to calculate practical durations required to carry out the activities and to develop scheduling using primavera P6 software. Research methodology were adapted by the author to reach requirements of the objectives. In this project author used 7x9 global calendar with considering the holidays like Labor Day on 1st May 2016 and Holi on 24th March 2016. Predecessors and successors were added to the activities. Author followed plan update to automatically update in the software. Duration of the project as per Primavera that is shortest time in which project can be completed is 109 days.

4.2. STUDY OF PRIMAVERA P6:

Primavera is the project management software which helps in scheduling of the project, helps in monitoring the project status at every stage. It is used for creating project baselines, from its initial phase to the end of the project. Primavera p6 PPM (Professional Project Management) & Primavera P6 EPPM (Enterprise Portfolio Project Management) are the two types of Primavera P6 product.

Using a locally installed database, P6 PPM is used as a standalone application. If a database server can be shared, it offers a multi-user system.

A web-based solution called P6 EPPM is more focused toward the enterprise as a whole and has strong portfolio management, enterprise dashboards, a tool for selecting future projects, etc.

Following are the elements involved in scheduling of the project:

a) Enterprise Project Structure(EPS):

EPS is Enterprise Project Structure. Primavera is an Enterprise Project Management software package that enables many projects to be managed in one database, these projects may be summarized under a hierarchical structure titled the Enterprise Project Structure (EPS) [11].

EPS is a hierarchical arrangement of projects in an organization. It is the complete structure of the company with its branches. It includes all projects or programs of an enterprise/organization. It is structured according to requirements of an organization. For example company may have energy, engineering & construction and manufacturing like divisions as given in following figure. So EPS can be created for manufacturing, construction and energy divisions.

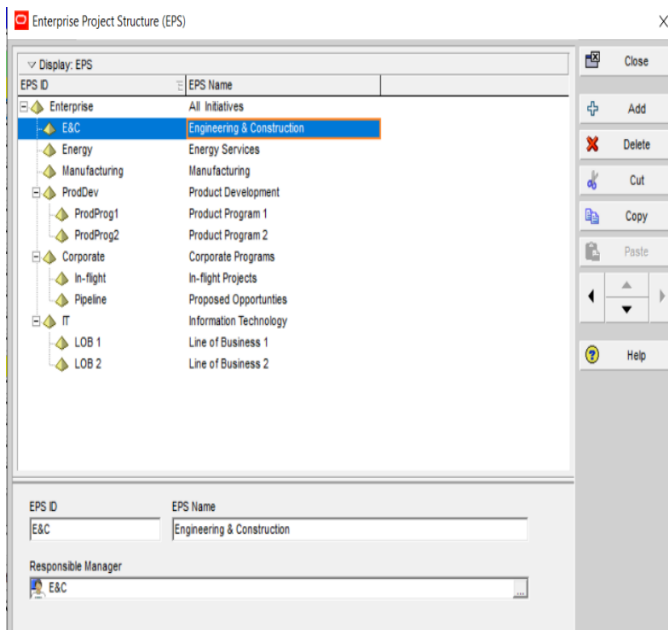


Fig.1.EPS

b) Organization Breakdown Structure(OBS):

It is created after creation of Enterprise Project Structure. It reflects people responsible for functioning of the organization. It defines how people within a company are organized and what access they have to various projects. Management structure of the organization is shown by the organization breakdown structure.

Different persons or managers responsible for the different works of the organization are shown by the OBS. It can be created based on type of project, its size whether it is small, simple or large and complex. For example, OBS can be CAD draftsman, project engineer, design engineer, etc.

c) Calendar in Primavera:

In Primavera you can create and assign calendars to each resource, each project and each activity. Any project is a time bound project, it has definite start and finish dates. So scheduler have to plan entire work within this duration. A standard 6 day workweek calendar is made with necessary holidays in it as work is carried out in 6 days per week. Primavera p6 supports three types of calendar namely global, project and resource calendar.

Global calendar is defined for all the EPS or for all the projects. Project Calendar is only applicable for project. Resource calendar is only applicable for resources. Calendar in the primavera can be modified according to users or contractors need.

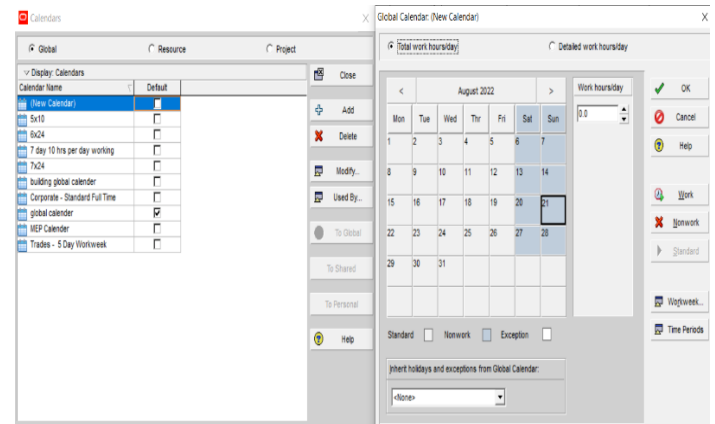


Fig.2.Creating Calendar

d) Work Breakdown Structure(WBS):

WBS, a work breakdown structure is a tool used to divide complex project into smaller tasks to manage it effectively. It is a key project deliverable that organizes project's total work into manageable sections. It is a particularly important project tool.

WBS can be divided up to any number of levels depending upon requirement of project. Different activities can be categories under the different section of the project. It makes complex project simpler and easier to handle.

According to Paul E Harris, "WBS should be as simple as possible to help the project participants comprehend hole components of the project; when decomposing the work scope, the lowest levels (Work Packages) should be countable and assignable" [11].

e) Project:

Project is a set of activities and data that makes up a plan for creating a product or service. It has a definite start and end. Project may include construction of new building, creating a After creating a new project, user have to make some setting into the primavera according to the needs of the project like creating calendar, creating activities of the project in respective WBS, column to be shown in classic schedule layout, etc.

f) Activities or Tasks:

WBS are further divided into tasks or activities. These are tasks that need to be performed to produce the deliverables. By default layout of the project window is classic schedule layout.

User can add as many columns required to be shown in the project window from toolbar by clicking on column or one can also add column by right clicking and then clicking on column.

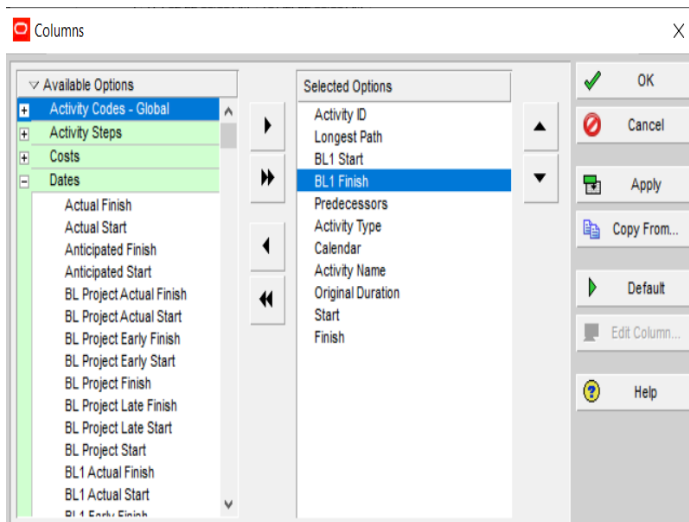


Fig.3. Activity columns

Types of Activities:

There are different type of activities such as task dependent activity, start milestone, finish milestone and WBS summary activity. The activity calendar of project is used by task dependent activity to calculate start and finish dates of the project. Mostly preferred activity type is task dependent activity.

Start milestone is the type of activity which is used to show the start of the project with zero duration. It has only a start date and not finish date. Finish milestone is used to show finish of the project.

Activity Relationship:

Once activities are defined user needs to find out the relation between activities so that every activity can be linked to the other activity forming a network. Dependency of the activity on one another means, one activity can start after the completion of the other activity. For example marking of the footing can start after cleaning of the site is done.

Finish to start relationship, finish to finish relationship, start to start relationship and start to finish relationship are the four different types of the relationship.

Finish to start relationship is the type relationship in which successor activity starts only when predecessor activity is ended.

Finish to finish relationship is defined as the relationship of an activity in which finish date of predecessor is defined by the finish date of successor.

In start to finish type of relationship, the successor activity cannot finish until predecessor activity has started.

Lead and Lag:

Lead and lag is added to the activities to produce a schedule in which we have sufficient risk incorporated without changing relationships of the activities. Without changing relationship between the activities and duration of activity, buffer time can be added using lead and lag.

When there is chance of delay of activity, user think that delay might occur, then user adds days to successor activity so that even after delay of the activity, relationship between the activities remains same, this added duration to the activity is called as lag. User can add lag to the activity in activity detail window directly.

Lead is also known as negative lag. Lead time is time by which we can accelerate successor activity without changing their relationship. For example, site clearance of a project is predecessor to the excavation. Both works can be done simultaneously, excavation work can be started after the cleaning of we can say 75 % of site. By using lead user can start one task without waiting for other task to end and can save time.

Activity Duration:

The duration of a particular task is the time required for an activity to complete its work. The duration required for each task can be entered directly in activity window in 'original duration' column.

By entering the duration of each activity, primavera schedules entire project. To do this user has to put starting date of the project in 'current data date' of 'schedule window'. By doing this primavera calculates start date and finish date of each activity.

If there is any delay in any activity, primavera shifts the dates of the other activities.

Longest path:

CPM (critical path method) is used in the primavera to calculate longest path of the project. After adding and scheduling the activities, primavera automatically calculates the longest path of the activity.

Critical path is shown in the Gantt chart. From the Gantt chart representation given by the primavera one can easily identify the critical and non-critical activities. The representation of the activities in the form of Gantt chart helps user to understand the project with ease.

Status of the activity:

After the scheduling whole project with appropriate sequence, scheduler needs to update the activity whether it is completed or incomplete. Adding duration or time required for each activity in to column, primavera schedules activity by only entering starting date of the project. In activity detail window user can update progress of project.

Dissolving activity:

When user wants to delete or remove certain activity, the dissolve command from edit tab is used. By using this command user can remove any activity without disturbing sequence of the other activities.

It deletes the certain activity user wants to remove from its project schedule and rejoin the predecessor and successor

activities with finish to start relationship. To give you an idea, if user wants to remove painting from schedule of construction project of residential building, as owner does not want to paint his house yet, user will just dissolve ‘painting’ from the schedule of tasks.

4.3. DATA COLLECTION:

Data of the buildings were collected from the contractor which is used for the scheduling of the building. The 10 buildings are taken to study and understand the software primavera P6.

Table no. 1: Project Building No. 1 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Ramesh Sutar
4	Total built up area	1328 Sq.ft
5	Project start date	5 December 2020
6	Project end date	17 August 2021
7	Total duration of project	241 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Kharde, Shirpur

Table no. 2: Project Building No. 2 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. K. J. Rajput
4	Total built up area	1449.5 Sq.ft
5	Project start date	12 December 2020
6	Project end date	5 January 2022
7	Total duration of project	389 days
8	No. of storeys	2
9	Status of construction	Completed
10	Site location	Vidyavihar Colony, Shirpur

Table no. 3: Project Building No. 3 Details

1	Project name	Residential building project
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2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Nanusing Rajput
4	Total built up area	1125 Sq.ft
5	Project start date	11 February 2021
6	Project end date	26 September 2021
7	Total duration of project	227 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Degav, Tal – Shindkheda, Dist - Dhule

Table no. 4: Project Building No. 4 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Mangalsing Rajput
4	Total built up area	640 Sq.ft
5	Project start date	21 February 2021
6	Project end date	23 August 2021
7	Total duration of project	183 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Chilane, Tal – Shindkheda, Dist. - Dhule

Table no. 5: Project Building No. 5 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Kishor Koli
4	Total built up area	1503 Sq.ft
5	Project start date	5 October 2021
6	Project end date	29 June 2022
7	Total duration of project	267 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Bajirao Nagar, Shirpur

Table no. 6: Project Building No. 6 Details

1	Project name	Institutional building project
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2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Dr. Rahul Badgujar
4	Total built up area	602.67 Sq.ft
5	Project start date	8 November 2021
6	Project end date	21 May 2022
7	Total duration of project	194 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Arthe, Shirpur

Table no. 7: Project Building No. 7 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Ishwar Bagul
4	Total built up area	1449.5 Sq.ft
5	Project start date	12 November 2021
6	Project end date	12 August 2022
7	Total duration of project	273 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Waghadi, Shirpur

Table no. 8: Project Building No. 8 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Sonu Rajput
4	Total built up area	920 Sq.ft
5	Project start date	20 November 2021
6	Project end date	29 May 2022
7	Total duration of project	190 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Degav, Tal – Shindkheda, Dist. - Dhule

Table no. 9: Project Building No. 9 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Shirsath
4	Total built up area	1205.4 Sq.ft
5	Project start date	2 December 2021
6	Project end date	12 August 2022
7	Total duration of project	253 days
8	No. of storeys	1
9	Status of construction	Completed
10	Site location	Shingave, Shirpur

Table no. 3.10: Project Building No. 10 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Ganesh Patil
4	Total built up area	1107.6 Sq.ft
5	Project start date	25 December 2021
6	Project end date	12 September 2022
7	Total duration of project	261 days
8	No. of storeys	1
9	Status of construction	Ongoing
10	Site location	Chilane, Tal – Shindkheda, Dist. - Dhule

The project of Ongoing residential building is also taken, in order to understand the updating of the project, which is located at Bijasani Nagar, Shingave Shivar, Shirpur using project management software Primavera P6.

Table no. 3.11: Project Building No.11 Details

1	Project name	Residential building project
2	Name of agency	Mauli Constructions and Developers, Shirpur
3	Name of Owner	Mr. Maharu Nimba Koli
4	Total built up area	1233.75 Sq.ft
5	Project start date	17 Feb 2022

6	Expected Project end date	17 Oct 2022
7	Total duration of project	8 Months (242 days)
8	No. of storeys	1
9	Status of construction	Ongoing
10	Site location	Bijasani Nagar, Shingave Shivar, Shirpur



Fig.6: Ground Beam

Site photos:



Fig.4: Excavation



Fig.5: Footing



Fig.7: Brick work and casting of plinth beam



Fig.8: Backfilling



Fig.9: Brickwork



Fig.10.Slab

Using the features of primavera the project duration is reduced without using conventional methods like PERT & CPM.

The following plan has been considered for the scheduling of project with the help of primavera p6:

- 1) **Creation of New Project:**
 Project consist of different activities. This project is created under division E&C. For creating new project, project name, project ID and project start date are specified. Different project name and ID's are given to the different projects like Project 01, Project 02, Project 03, Project 04, Project 05, Project 06, Project 07, Project 08, Project 09 and Project 10 are the project names given to the project ID's PROJ01, PROJ02, PROJ03, PROJ04, PROJ05, PROJ06, PROJ07, PROJ08, PROJ09 and PROJ10 respectively. Here in this ongoing project 'RESIDENTIAL BUILDING 1' is the name of the project and 'NEWBUILDPROJ' is the project id of the project. The project start date of the building constructions are entered in the dialogue box like the project start date of the ongoing residential building is 17th February 2022. Textbox to enter finish date of project is also given in dialogue box as 'Must Finish by', but user don't need to enter this value and if he wish to enter this value it is utilized as a project late finish date, the date at which project must be completed.

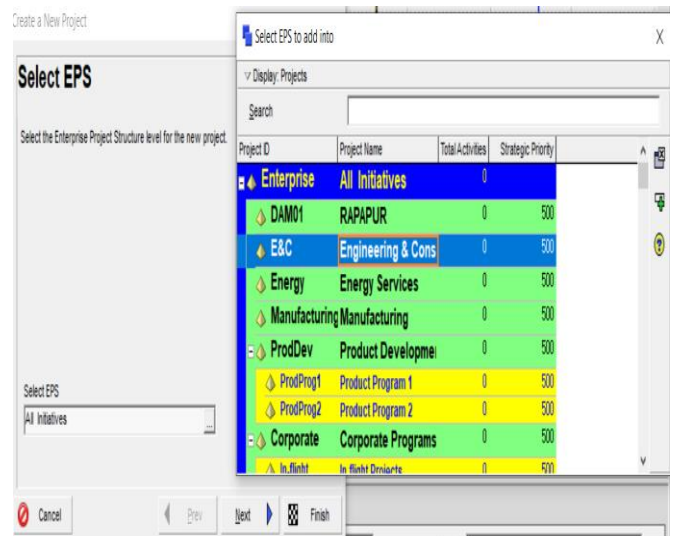


Fig 11.Selection of EPS as E & C

4.4. SHEDULING OF BUILDINGS IN SOFTWARE:

Eleven buildings construction project are taken for the planning and scheduling in project management primavera p6.

The ongoing construction project is located at Bijasani Nagar, Shingave Shivar, Shirpur in district Dhule. This project is ongoing project and it is started on 17th February 2022. The requisite data has been collected from prevailing site conditions.

Based on data of different buildings obtained from the contractor network diagram is prepared and relations are assigned between the activities to calculate the critical path and the total duration of project is calculated by primavera.

and Substructure. For different buildings different WBS were adapted according to need of that construction building.

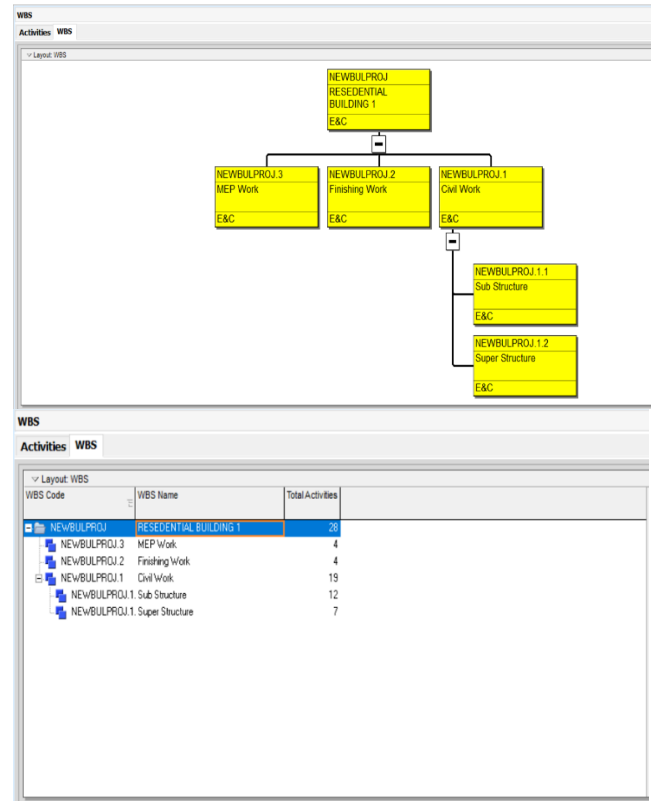


Fig 14.WBS of Project

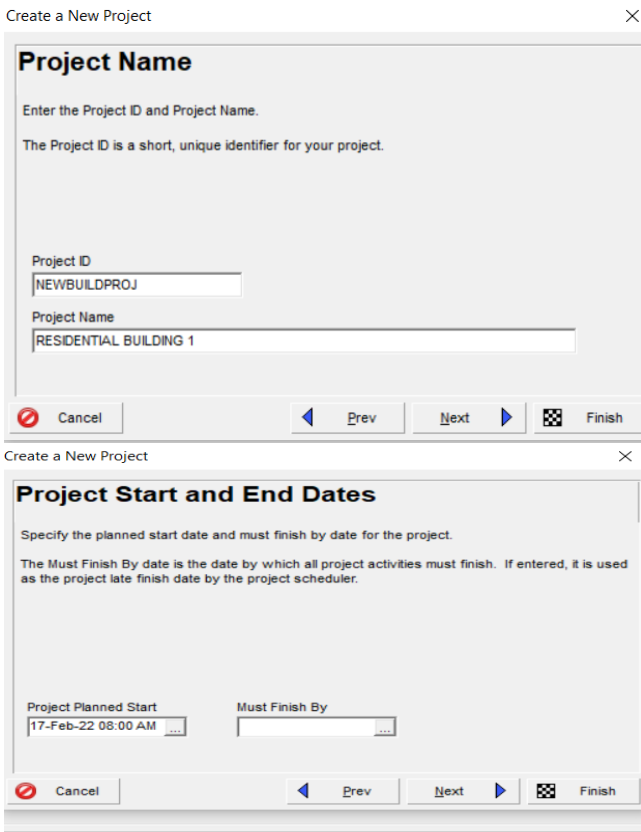


Fig 12.Entering project details

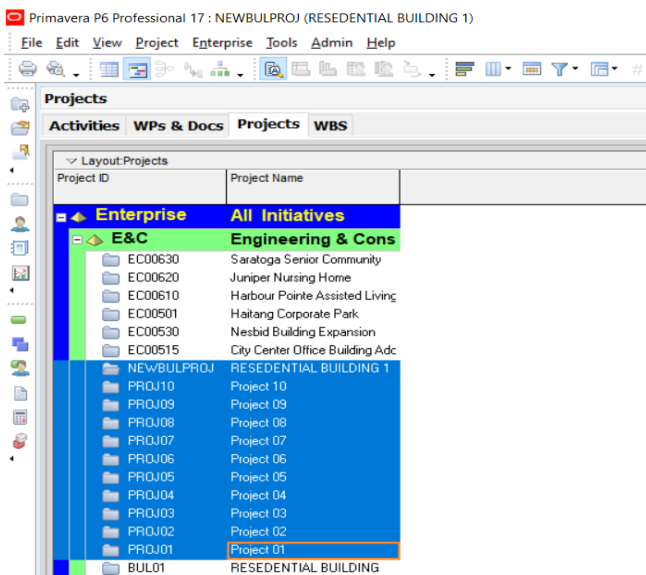


Fig 13.Projects created under EPS

2) Creating a WBS:

The following figure shows WBS of the ongoing NEWBULPROJ project work. WBS divides activities of the project work into different phases. This project is divided into different phases as civil work, MEP work and Finishing work. Civil work is further subdivided into Superstructure

3) Creating Activities:

Different activities comes under various WBS of the project. Different WBS structure is adapted for different construction buildings as per its requirement.

In this project, for ongoing residential building, under WBS Civil Work there are 2 sub division of WBS Civil Work, Substructure and Superstructure which contains different sets of activities.

Substructure has activities which takes place while constructing substructure of the residential building like cleaning, marking, excavation, etc. whereas Substructure has activities which takes place while constructing superstructure of the residential building as shown in below figure.

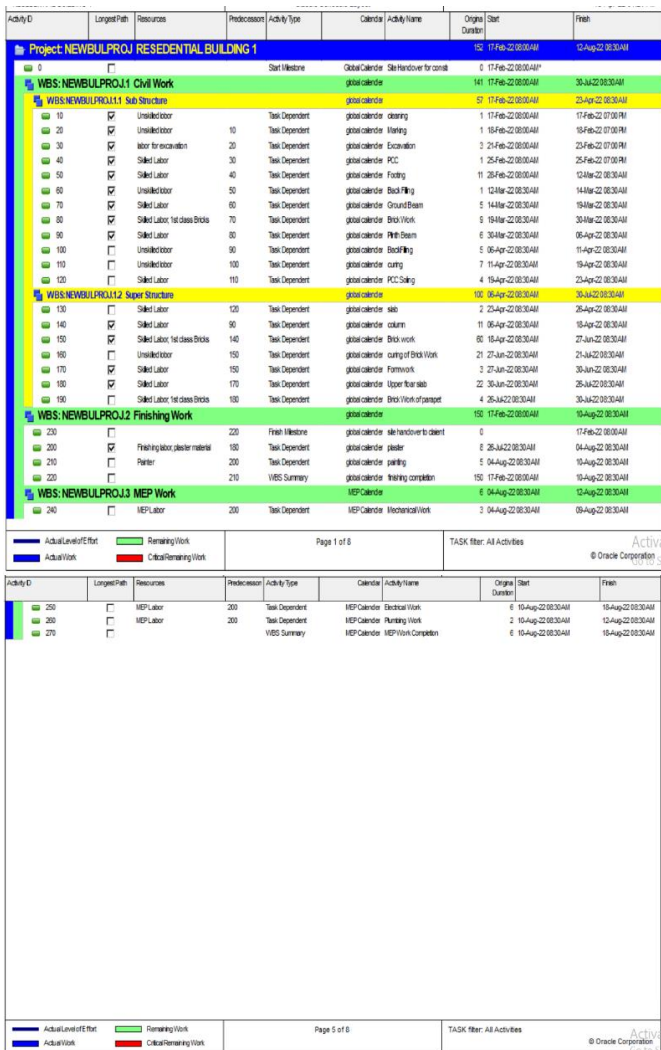


Fig 15. Activities in Project

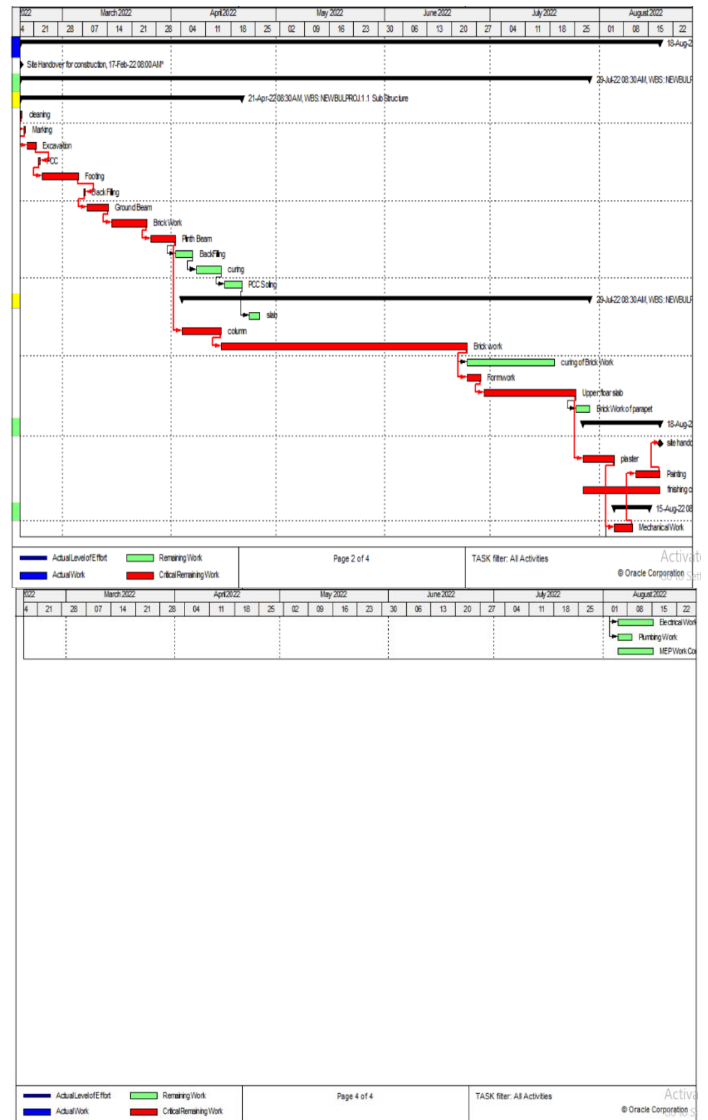


Fig 16. Gantt chart of activities

Gantt chart:

The illustration of the project schedule is shown by the Gantt chart on the right hand side of the primavera window. Gantt chart provides greater insight into schedule flexibility. It gives overview of the project tasks they must complete along with a timetable to finish their work.

Critical Activities:

A critical activity in project management is the activity whose delay results in the delay of whole project. Understanding the critical path of the project allows to prioritize which tasks requires a greater focus. These activities are shown by the red bars in the Gantt chart whereas non-critical activities are shown by the green bars in Gantt chart. For non-critical activities, if there is any delay in these areas, it is still possible to finish on time without any activity being affected. It is a zero float activity.

Out of huge numbers of activities, it helps to identify activity which impact overall duration of project & hence must not be delayed to prevent delay of the project.

The critical and non-critical activities shown in the Gantt charts helps user to understand project without even looking at schedule. Gantt chart provides ease of understanding the schedule of project by giving all in a diagrammatic form.

4) **Creating baselines:**

Baseline is a complete copy of the project. It is the fixed project schedule that reflects all formally authorized scope and schedule changes against which project performance is

measured. Baseline is created at the very beginning of the project so that it can be compared with the current state of project. Primavera P6 allows to create many baselines for comparison to the current schedule and gives each user the ability to assign up to three baselines to the current schedule for data comparisons.

Three baselines are used in this project. Baseline 1, Baseline 2 and Baseline 3 is shown by the yellow solid color, red hatch and violet cross pattern respectively. Bar style can be changed from 'Bar Setting'. Baseline is maintained and it is then assigned to the project. Once any critical activity takes more time than its schedule time Baseline 2 is created.

The screenshot shows the 'Maintain Baselines' dialog box for 'RESEDENTIAL BUILDING 1'. It lists 'BASELINE 1' and provides options to Add, Delete, Copy, Restore, and Help. Below this is the 'Assign Baselines' dialog box, where 'NEWBULPROJ : RESEDENTIAL BUILDING 1' is selected as the Project and 'BASELINE 1' as the Project Baseline. Under 'User Baselines', 'BASELINE 1' is set as the Primary baseline, while Secondary and Tertiary are set to '<None>'. The 'OK' button is highlighted.

Fig 17. Assigning and Maintaining Baseline 1

Activity ID	Longest Path	Resources	Prede	Activity Type	Calendar	Activity Name	Orign	Start	BL1 Start	Finish	BL1 Finish
0				Start/Endnote	globalcalendar	Site Handover to	0	17-Feb-22 08:00 AM	17-Feb-22 08:00 AM	22-Aug-22 07:00 PM	18-Aug-22 07:30 AM
Project NEWBULPROJ RESEDENTIAL BUILDING											
10		Unskilled labor		Task/Dependent	globalcalendar	clearing	1	17-Feb-22 08:00 AM	17-Feb-22 08:00 AM	17-Feb-22 07:00 PM	17-Feb-22 07:00 PM
20		Unskilled labor		Task/Dependent	globalcalendar	laying	1	18-Feb-22 08:00 AM	18-Feb-22 08:00 AM	18-Feb-22 07:00 PM	18-Feb-22 07:00 PM
30		labor for excavation	20	Task/Dependent	globalcalendar	Excavation	2	19-Feb-22 08:00 AM	19-Feb-22 08:00 AM	21-Feb-22 07:00 PM	21-Feb-22 07:00 PM
40		Skilled labor	30	Task/Dependent	globalcalendar	PCC	1	22-Feb-22 08:00 AM	22-Feb-22 08:00 AM	22-Feb-22 07:00 PM	22-Feb-22 07:00 PM
50		Skilled labor	40	Task/Dependent	globalcalendar	Forming	10	23-Feb-22 08:00 AM	23-Feb-22 08:00 AM	06-Mar-22 07:00 PM	05-Mar-22 07:00 PM
60		Unskilled labor	50	Task/Dependent	globalcalendar	Backfilling	1	07-Mar-22 08:00 AM	07-Mar-22 08:00 AM	07-Mar-22 07:00 PM	07-Mar-22 07:00 PM
70		Skilled labor	60	Task/Dependent	globalcalendar	Concret Beam	5	08-Mar-22 08:00 AM	08-Mar-22 08:00 AM	14-Mar-22 08:00 PM	14-Mar-22 08:00 AM
80		Skilled labor / technical Dth	70	Task/Dependent	globalcalendar	Block Work	8	15-Mar-22 08:00 AM	15-Mar-22 08:00 AM	25-Mar-22 07:00 PM	25-Mar-22 08:30 AM
90		Skilled labor	80	Task/Dependent	globalcalendar	Fit & Beam	6	26-Mar-22 08:00 AM	26-Mar-22 08:00 AM	02-Apr-22 07:00 PM	03-Apr-22 08:30 AM
100		Unskilled labor	90	Task/Dependent	globalcalendar	Backfilling	4	02-Apr-22 08:00 AM	02-Apr-22 08:00 AM	07-Apr-22 07:00 PM	07-Apr-22 08:30 AM
110		Unskilled labor	100	Task/Dependent	globalcalendar	cutting	8	08-Apr-22 08:00 AM	08-Apr-22 08:00 AM	15-Apr-22 07:00 PM	15-Apr-22 08:30 AM
120		Skilled labor	110	Task/Dependent	globalcalendar	PCC Slab	6	16-Apr-22 08:00 AM	16-Apr-22 08:00 AM	21-Apr-22 07:00 PM	21-Apr-22 08:30 AM
WBS:NEWBULPROJ1.2 Super Structure											
130		Skilled labor	120	Task/Dependent	globalcalendar	slab	3	23-Apr-22 08:00 AM	23-Apr-22 08:00 AM	26-Apr-22 07:00 PM	26-Apr-22 08:30 AM
140		Skilled labor	90	Task/Dependent	globalcalendar	column	14	04-Apr-22 08:00 AM	04-Apr-22 08:00 AM	18-Apr-22 07:00 PM	18-Apr-22 08:30 AM
150		Skilled labor / technical Dth	140	Task/Dependent	globalcalendar	Block work	61	15-Apr-22 08:00 AM	15-Apr-22 08:00 AM	26-Jun-22 07:00 PM	24-Jun-22 08:30 AM
160		Unskilled labor	150	Task/Dependent	globalcalendar	cutting of brick W	21	26-Jun-22 08:00 AM	26-Jun-22 08:00 AM	22-Jul-22 07:00 PM	19-Jul-22 08:30 AM
170		Skilled labor	160	Task/Dependent	globalcalendar	Formwork	4	26-Jun-22 08:00 AM	26-Jun-22 08:00 AM	02-Jul-22 07:00 PM	28-Jun-22 08:30 AM
180		Skilled labor	170	Task/Dependent	globalcalendar	Upper floor slab	22	05-Jul-22 08:00 AM	26-Jun-22 08:00 AM	29-Jul-22 07:00 PM	25-Jul-22 08:30 AM
190		Skilled labor / technical Dth	180	Task/Dependent	globalcalendar	Block Work of par	4	30-Jul-22 08:00 AM	25-Jul-22 08:00 AM	02-Aug-22 07:00 PM	29-Jul-22 08:30 AM
WBS:NEWBULPROJ2 Finishing Work											
200			200	Finish/Endnote	globalcalendar	site Handover to	0	22-Aug-22 08:00 PM	22-Aug-22 08:00 PM	18-Aug-22 08:30 AM	18-Aug-22 08:30 AM
210		Finishing labor, plaster	190	Task/Dependent	globalcalendar	plaster	8	02-Aug-22 08:00 AM	27-Jul-22 08:30 AM	15-Aug-22 07:00 PM	05-Aug-22 08:30 AM
220		Painter	210	Task/Dependent	globalcalendar	Painting	5	15-Aug-22 08:00 PM	11-Aug-22 08:30 AM	22-Aug-22 08:00 PM	18-Aug-22 08:30 AM
230		WBS Summary		WBS Summary	globalcalendar	finishing complete	17	02-Aug-22 08:00 AM	27-Jul-22 08:30 AM	22-Aug-22 08:00 PM	18-Aug-22 08:30 AM
WBS:NEWBULPROJ3 MEP Work											
240		MEP labor	200	Task/Dependent	MEP calendar	Mechanical Work	3	11-Aug-22 07:00 AM	05-Aug-22 08:30 AM	15-Aug-22 08:00 PM	15-Aug-22 08:30 AM

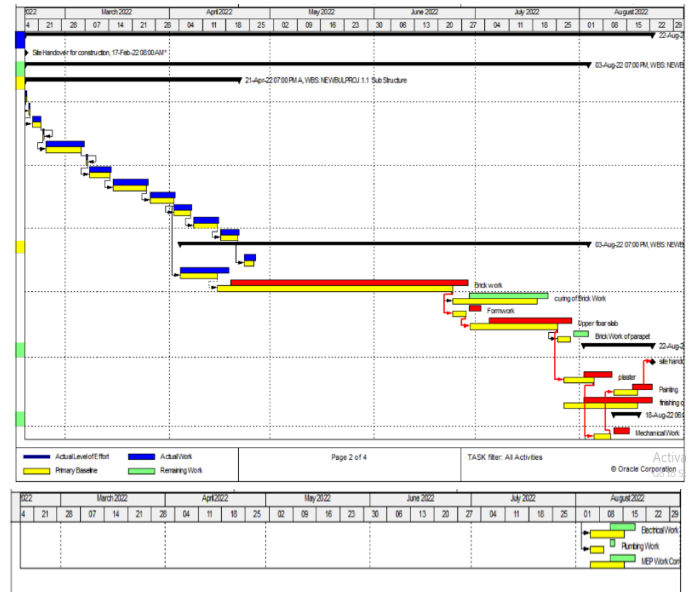


Fig 18. Gantt chart and schedule for Baseline 1

The screenshot shows the 'Assign Baselines' dialog box for 'RESEDENTIAL BUILDING 1'. It lists 'BASELINE 1' and 'BASELINE 2'. Below this is the 'Assign Baselines' dialog box, where 'NEWBULPROJ : RESEDENTIAL BUILDING 1' is selected as the Project and 'BASELINE 1' as the Project Baseline. Under 'User Baselines', 'BASELINE 1' is set as the Primary baseline, 'BASELINE 2' as the Secondary baseline, and Tertiary is set to '<None>'. The 'OK' button is highlighted.

Fig 19. Assigning and Maintaining Baseline 2

Fig 21. Assigning and Maintaining Baseline 3

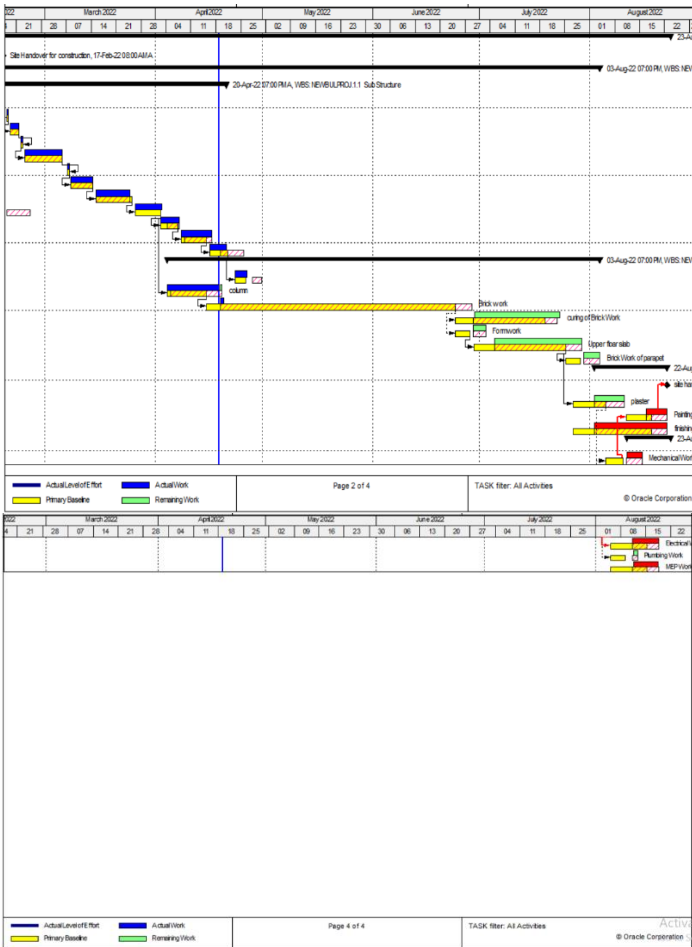


Fig 20. Gantt chart for Baseline 2

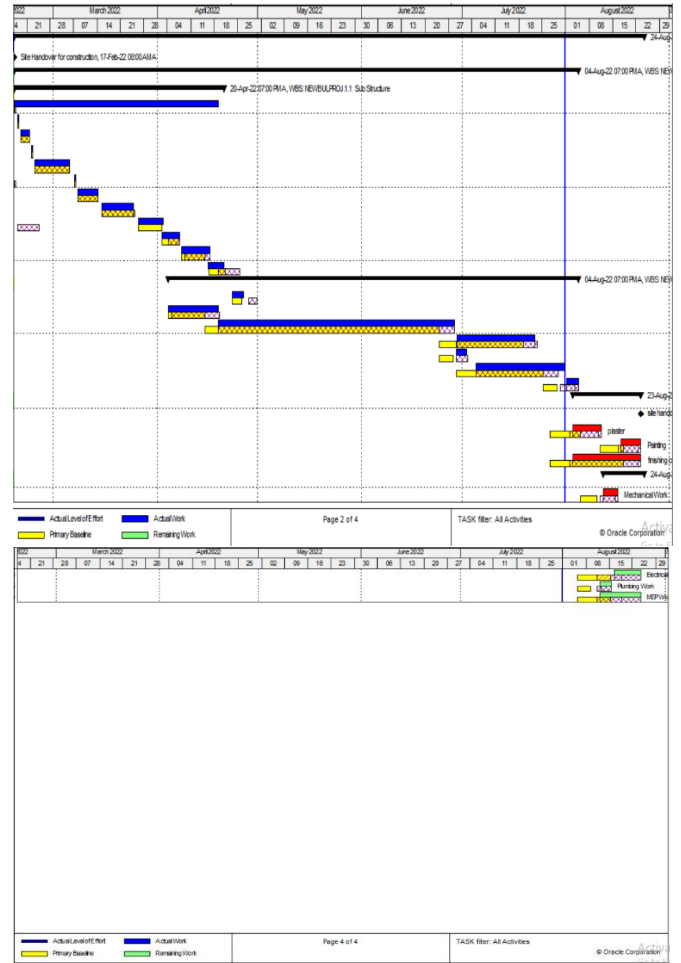


Fig 22. Gantt chart for Baseline 3

Maintain Baselines

Project Name/Baseline Name: RESEDENTIAL BUILDING 1

- BASLINE 1
- BASLINE 2
- BASLINE 3

Baseline Name: BASLINE 3

Baseline Type: Mid Project Status Be

Data Date: 01-Aug-22 12:1

Assign Baselines

Project: NEWBULPROJ : RESEDENTIAL BUILDING 1

Project Baseline: BASLINE 3

User Baselines

- Primary: BASLINE 1
- Secondary: BASLINE 2
- Tertiary: BASLINE 3

5)

Updating of project:

Updating of the project in Primavera P6 is the process of gathering information from the field and updating the schedule of the project. After setting up of baseline of project, next step is to update a project by taking field observations of activities. In Primavera there are two methods for updating a project, by automatically and by manually. Automatic updating of project is done by using "Update Progress" option present in "Tools" of the primavera software. This feature is used only when project is going exactly as per the baseline plan, otherwise manual method of updating progress of the project is used.

In this residential building project manual method is used because project is not going exactly as baseline plan. Status of the project is updated by entering actual start date and end date of the project as shown in the below fig.

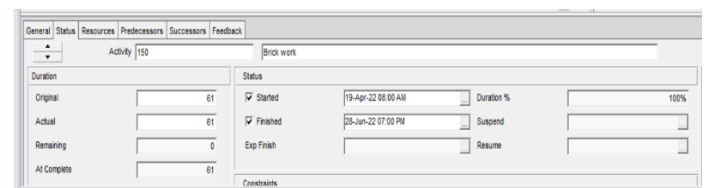


Fig 23. Updating of project progress

6) Tracking of Project Progress:

Tracking of project progress is the process of monitoring a projects progress against the original schedule of the project. It provides basis to capture work progress against the baseline plan. Because of this, early visibility of schedule problems is possible. The tracking is done by going to the schedule tab. “View Log” option opens notepad which shows the project progress, whether the activity is completed or not completed, number of activities and in progress activity, etc.

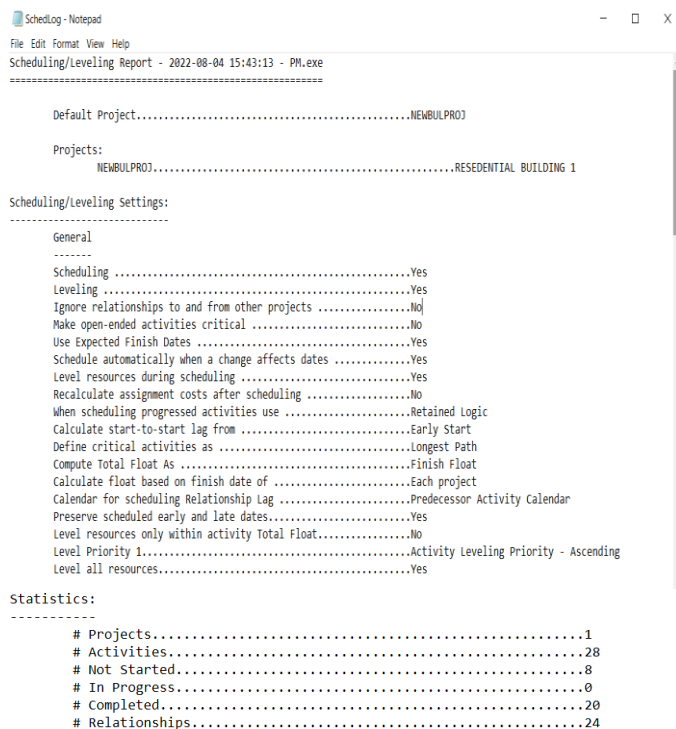


Fig 24. Tracking of Project Work

For ‘Residential Building 1’ start date and end date of the project before applying actual dates were 17 February 2022 and 15 August 2022 respectively. After updating, the start date is 17 February 2022 and end date is 23 August 2022 as there were some delays in the project work. Three baselines were assigned and maintained as required. After the delay primavera automatically shifts the date of the project.

The total duration of the project as per primavera software is 180 days and estimated duration of the project is 242 days that is 8 months. Hence project duration of the project is reduced by 62 days that is nearly about 2 months.

Table No. 12: Comparison of durations

Project ID	Start date in Primavera	End date in Primavera	Actual end date (Days)	Actual Total duration	Total duration in primavera	Duration reduced by (days)
Proj01	5/12/20	29/6/21	17/10/21	241	206	35
Proj02	12/12/20	6/11/21	5/1/22	389	329	60
Proj03	11/2/21	17/8/21	26/9/22	227	187	40
Proj04	21/2/21	22/7/21	23/8/21	183	151	32
Proj05	5/10/21	29/4/22	29/6/22	267	206	61
Proj06	8/11/21	12/4/22	21/5/22	194	155	39
Proj07	12/11/21	14/1/22	12/8/22	273	214	59
Proj08	20/11/21	26/4/22	29/5/22	190	157	33
Proj09	2/12/21	25/6/22	12/8/22	253	205	48
Proj10	25/12/21	19/6/22	12/9/22	261	206	55
Newbulproj	17/2/22	23/8/22	17/10/22	242	180	62

4.5. DETERMINING TOTAL DURATION OF PROJECT IN SOFTWARE:

The total duration of the project is found out by scheduling the project in the software. The user has to put on the date of starting of the project while creating a new project. The activities were sequenced and created under different WBS structure. After clicking on the schedule tab from the software, the activities are being scheduled automatically and each activity has start date and end date of its own. Thus just by creating a project, entering its start date and scheduling activities gives the expected project end date to the scheduler.

4.6. COMPARISON OF ESTIMATED DURATION AND DURATION CALCULATED BY PRIMAVERA:

Updating of the progress is done in the pre-planned schedule. Following table shows the start date according to primavera, end date according to primavera, actual end date, duration reduced and actual duration of the project, total duration in primavera.

5. RESULTS & CONCLUSIONS

Figures are given below showing result of a particular project from schedule log which is obtained in tools tab.

Scheduling/Leveling Results:

```

# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....23
# Relationships with other projects.....0
Data Date.....05-Dec-20 12:00 AM
Earliest Early Start Date.....05-Dec-20 08:00 AM
Latest Early Finish Date.....29-Jun-21 07:00 PM
Exceptions:
Critical Activities.....15
Project: PROJ01 Activity: 10 cleaning
Project: PROJ01 Activity: 140 Column
Project: PROJ01 Activity: 150 Brick Work
Project: PROJ01 Activity: 170 Form work
Project: PROJ01 Activity: 180 Upper Floor Slab
Project: PROJ01 Activity: 20 Marking
Project: PROJ01 Activity: 200 Plaster
Project: PROJ01 Activity: 220 Finishing Completion
Project: PROJ01 Activity: 30 Excavation
Project: PROJ01 Activity: 40 PCC
Project: PROJ01 Activity: 50 Footing
Project: PROJ01 Activity: 60 Backfilling
Project: PROJ01 Activity: 70 Ground Beam
Project: PROJ01 Activity: 80 Brick Work
Project: PROJ01 Activity: 90 Plinth Beam

```

Fig 23.Result from schedule log for project – Project 01

Scheduling/Leveling Results:

```

# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....23
# Relationships with other projects.....0
Data Date.....11-Feb-21 12:00 AM
Earliest Early Start Date.....11-Feb-21 08:00 AM
Latest Early Finish Date.....17-Aug-21 07:00 PM
Exceptions:
Critical Activities.....15
Project: PROJ03 Activity: 10 cleaning
Project: PROJ03 Activity: 140 Column
Project: PROJ03 Activity: 150 Brick Work
Project: PROJ03 Activity: 170 Form work
Project: PROJ03 Activity: 180 Upper Floor Slab
Project: PROJ03 Activity: 20 Marking
Project: PROJ03 Activity: 200 Plaster
Project: PROJ03 Activity: 220 Finishing Completion
Project: PROJ03 Activity: 30 Excavation
Project: PROJ03 Activity: 40 PCC
Project: PROJ03 Activity: 50 Footing
Project: PROJ03 Activity: 60 Backfilling
Project: PROJ03 Activity: 70 Ground Beam
Project: PROJ03 Activity: 80 Brick Work
Project: PROJ03 Activity: 90 Plinth Beam

```

Fig 25.Result from schedule log for project – Project 03

Scheduling/Leveling Results:

```

# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....27
# Relationships with other projects.....0
Data Date.....12-Dec-20 12:00 AM
Earliest Early Start Date.....12-Dec-20 08:00 AM
Latest Early Finish Date.....06-Nov-21 07:00 PM
Exceptions:
Critical Activities.....18
Project: PROJ02 Activity: 10 cleaning
Project: PROJ02 Activity: 140 Column
Project: PROJ02 Activity: 150 Brick Work
Project: PROJ02 Activity: 170 Form work
Project: PROJ02 Activity: 180 Upper Floor Slab
Project: PROJ02 Activity: 190 column
Project: PROJ02 Activity: 20 Marking
Project: PROJ02 Activity: 200 FF brick work
Project: PROJ02 Activity: 210 Curing of FF brickwork
Project: PROJ02 Activity: 220 slab
Project: PROJ02 Activity: 230 Parapet wall Brickwork
Project: PROJ02 Activity: 30 Excavation
Project: PROJ02 Activity: 40 PCC
Project: PROJ02 Activity: 50 Footing
Project: PROJ02 Activity: 60 Backfilling
Project: PROJ02 Activity: 70 Ground Beam
Project: PROJ02 Activity: 80 Brick Work
Project: PROJ02 Activity: 90 Plinth Beam

```

Fig 24.Result from schedule log for project – Project 02

Scheduling/Leveling Results:

```

# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....23
# Relationships with other projects.....0
Data Date.....21-Feb-21 12:00 AM
Earliest Early Start Date.....22-Feb-21 08:00 AM
Latest Early Finish Date.....22-Jul-21 07:00 PM
Exceptions:
Critical Activities.....15
Project: PROJ04 Activity: 10 cleaning
Project: PROJ04 Activity: 140 Column
Project: PROJ04 Activity: 150 Brick Work
Project: PROJ04 Activity: 170 Form work
Project: PROJ04 Activity: 180 Upper Floor Slab
Project: PROJ04 Activity: 20 Marking
Project: PROJ04 Activity: 200 Plaster
Project: PROJ04 Activity: 220 Finishing Completion
Project: PROJ04 Activity: 30 Excavation
Project: PROJ04 Activity: 40 PCC
Project: PROJ04 Activity: 50 Footing
Project: PROJ04 Activity: 60 Backfilling
Project: PROJ04 Activity: 70 Ground Beam
Project: PROJ04 Activity: 80 Brick Work
Project: PROJ04 Activity: 90 Plinth Beam

```

Fig 26.Result from schedule log for project – Project 04

Scheduling/Leveling Results:

```

-----
# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....23
# Relationships with other projects.....0
Data Date.....05-Oct-21 12:00 AM
Earliest Early Start Date.....05-Oct-21 08:00 AM
Latest Early Finish Date.....29-Apr-22 08:30 AM
Exceptions:
-----
Critical Activities.....15
Project:    PROJ05 Activity: 10   cleaning
Project:    PROJ05 Activity: 140  Column
Project:    PROJ05 Activity: 150  Brick Work
Project:    PROJ05 Activity: 170  Form work
Project:    PROJ05 Activity: 180  Upper Floor Slab
Project:    PROJ05 Activity: 20   Marking
Project:    PROJ05 Activity: 200  Plaster
Project:    PROJ05 Activity: 220  Finishing Completion
Project:    PROJ05 Activity: 30   Excavation
Project:    PROJ05 Activity: 40   PCC
Project:    PROJ05 Activity: 50   Footing
Project:    PROJ05 Activity: 60   Backfilling
Project:    PROJ05 Activity: 70   Ground Beam
Project:    PROJ05 Activity: 80   Brick Work
Project:    PROJ05 Activity: 90   Plinth Beam

```

Fig 27.Result from schedule log for project – Project 05

Scheduling/Leveling Results:

```

-----
# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....23
# Relationships with other projects.....0
Data Date.....12-Nov-21 12:00 AM
Earliest Early Start Date.....12-Nov-21 08:00 AM
Latest Early Finish Date.....14-Jun-22 08:30 AM
Exceptions:
-----
Critical Activities.....15
Project:    PROJ07 Activity: 10   cleaning
Project:    PROJ07 Activity: 140  Column
Project:    PROJ07 Activity: 150  Brick Work
Project:    PROJ07 Activity: 170  Form work
Project:    PROJ07 Activity: 180  Upper Floor Slab
Project:    PROJ07 Activity: 20   Marking
Project:    PROJ07 Activity: 200  Plaster
Project:    PROJ07 Activity: 220  Finishing Completion
Project:    PROJ07 Activity: 30   Excavation
Project:    PROJ07 Activity: 40   PCC
Project:    PROJ07 Activity: 50   Footing
Project:    PROJ07 Activity: 60   Backfilling
Project:    PROJ07 Activity: 70   Ground Beam
Project:    PROJ07 Activity: 80   Brick Work
Project:    PROJ07 Activity: 90   Plinth Beam

```

Fig 29.Result from schedule log for project – Project 07

Scheduling/Leveling Results:

```

-----
# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....23
# Relationships with other projects.....0
Data Date.....08-Nov-21 12:00 AM
Earliest Early Start Date.....08-Nov-21 08:00 AM
Latest Early Finish Date.....12-Apr-22 08:30 AM
Exceptions:
-----
Critical Activities.....15
Project:    PROJ06 Activity: 10   cleaning
Project:    PROJ06 Activity: 140  Column
Project:    PROJ06 Activity: 150  Brick Work
Project:    PROJ06 Activity: 170  Form work
Project:    PROJ06 Activity: 180  Upper Floor Slab
Project:    PROJ06 Activity: 20   Marking
Project:    PROJ06 Activity: 200  Plaster
Project:    PROJ06 Activity: 220  Finishing Completion
Project:    PROJ06 Activity: 30   Excavation
Project:    PROJ06 Activity: 40   PCC
Project:    PROJ06 Activity: 50   Footing
Project:    PROJ06 Activity: 60   Backfilling
Project:    PROJ06 Activity: 70   Ground Beam
Project:    PROJ06 Activity: 80   Brick Work
Project:    PROJ06 Activity: 90   Plinth Beam

```

Fig 28.Result from schedule log for project – Project 06

Scheduling/Leveling Results:

```

-----
# Projects Scheduled/Leveled.....1
# Activities Scheduled/Leveled.....23
# Relationships with other projects.....0
Data Date.....20-Nov-21 12:00 AM
Earliest Early Start Date.....20-Nov-21 08:00 AM
Latest Early Finish Date.....26-Apr-22 08:30 AM
Exceptions:
-----
Critical Activities.....13
Project:    PROJ08 Activity: 140  Column
Project:    PROJ08 Activity: 150  Brick Work
Project:    PROJ08 Activity: 170  Form work
Project:    PROJ08 Activity: 180  Upper Floor Slab
Project:    PROJ08 Activity: 200  Plaster
Project:    PROJ08 Activity: 220  Finishing Completion
Project:    PROJ08 Activity: 30   Excavation
Project:    PROJ08 Activity: 40   PCC
Project:    PROJ08 Activity: 50   Footing
Project:    PROJ08 Activity: 60   Backfilling
Project:    PROJ08 Activity: 70   Ground Beam
Project:    PROJ08 Activity: 80   Brick Work
Project:    PROJ08 Activity: 90   Plinth Beam

```

Fig 30.Result from schedule log for project – Project 08

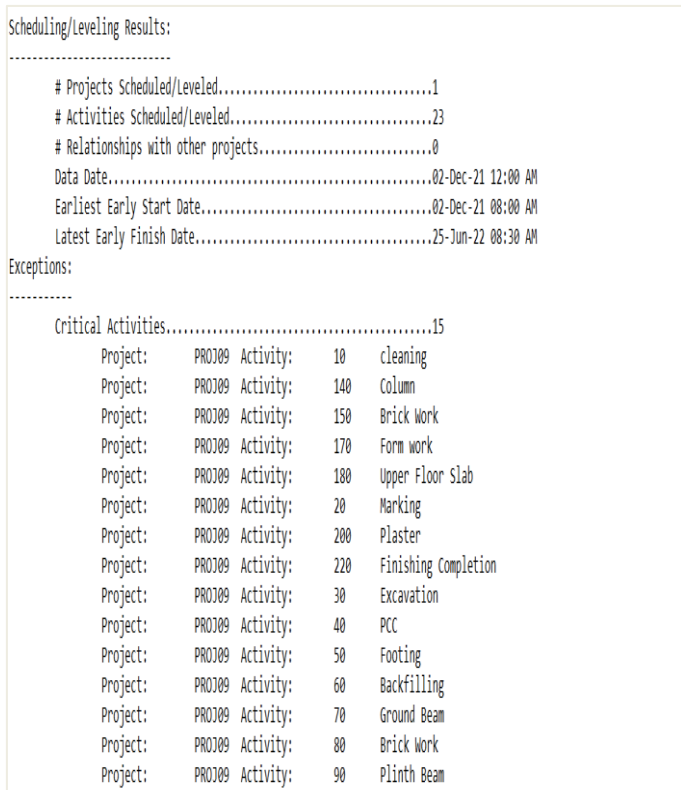


Fig 31.Result from schedule log for project – Project 09

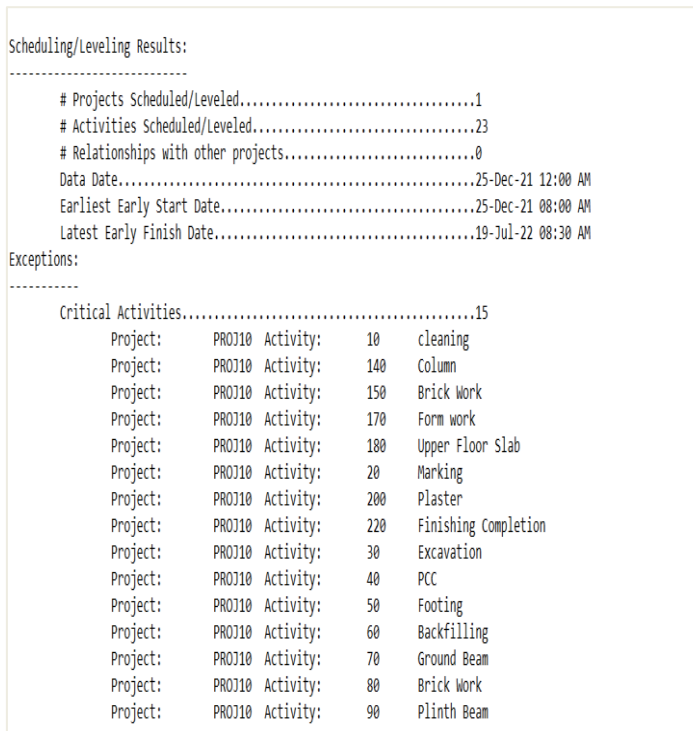


Fig 32.Result from schedule log for project – Project 10

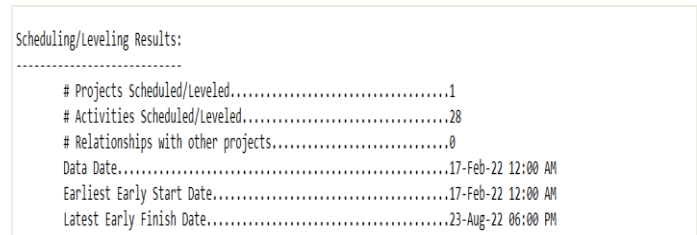


Fig 33.Result from schedule log for project - Residential building 1

Project duration of eleven buildings were computed in this project and time reduced by software is calculated. The project is studied with the help of various literatures and books.

By using management software Primavera P6, for the scheduling of ongoing construction project of residential building, the total duration of the project is calculated and baselines were created when there is delay in activity. Activities were rescheduled and compared with baseline.

- 1) Primavera P6 results into the effective planning and scheduling of the project and it helps to understand and forecast the progress of the construction project.
- 2) Problems coming into the project can be eliminated by the tracking of the project in primavera.
- 3) It helps to analyse the project more wisely with the help of Gantt chart – a diagrammatic representation of project activities.
- 4) Baselines created in the project helps contractor to track the project and compare it with reschedule activities.
- 5) When project is followed by the schedule in primavera then possibility of delay of activities can be reduced.

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