Building Information Modeling 4D integration of residential building using BIM, Primavera 6, and Power Project "A case study of Non-MPT Residence Building –JHANG."

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***Abstract*: 4D Preparation and Coordination of the Construction Project Using Project Management Tools and BIM In contrast to the past, the new construction sector is concerned with optimum project execution. To do this, the construction industry needs structured Planning, scheduling, and management mechanism that will enable the overall utilization of costs, time, and resources. The use of traditional project management software systems to clarify large-scale schemes to the different stakeholders participating in the development is not up to the mark. Direct use of scheduling sheets prepared with traditional drawing tools is a struggle to execute the operations' timetable. Instead, drawings and the development plan can be integrated on a geospatial framework to create a 4D view of the project's progress with BIM and Primavera P6 combined with the Power Project. Geographical Information Systems (GIS) as a spatial platform can be connected to the drawings and its accompanying project management tools extracted from the timetable for the successful execution of the project's development.**

***Keywords*: Power Project, BIM, GIS, Primavera P6, etc.**

I. INTRODUCTION

1.1 BUILDING INFORMATION MODELING

BIM is the Building Knowledge Simulation acronym. It is an ultimate progression that requires various partners and AEC (architecture, engineering, construction) experts to collaborate to plan, design, and install a building within a single 3D model. That may also be applied to the operation and maintenance of buildings using the data that the owners have access to. This data helps owners and stakeholders to make decisions on the basis of the relevant knowledge obtained from the Model—even after the building has been completed.

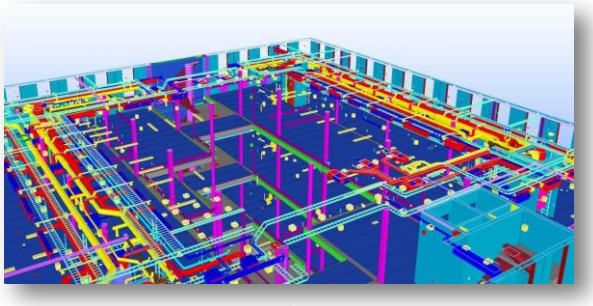


Figure 1.1 Building Information Modeling

1.2 THE COMPONENTS OF BIM

We also discussed the views of the BIM industry and the variety of alternatives to this collective exhibition venue. We addressed common myths and how exactly they are wrong. We've seen how BIM can promote a project company. This leaves us with a reasonably substantial sympathy for what BIM is and what it is not so that we can move towards an invaluable description. Let's go through the BIM process to unpack its real purpose.

B IS FOR BUILDING.

- *I IS FOR INFORMATION.*
- *M IS FOR MODELING.*

1.3 WHAT ARE BIM LEVELS?

Various stages of BIM can be accomplished with a number of forms of projects. Each level represents a separate position for standards that show a diligent level of growth. BIM levels begin at 0 and go to 4D, 5D, and even 6D BIM. The principle of these levels is to estimate how effective or to a large degree, how life-form knowledge is communicated and handled during the whole

process. So what's going on at any level, and how do you know what level you're operating on?

1.4 THE FUTURE OF BIM

Because of the clear advantages, BIM is persuaded that it is here to stay. It has established goals and objectives that are beneficial to all those who use their way through the stages. Undoubtedly, the future of building will be much more interactive and interactive. As BIM gets increasingly more advanced, 4D, 5D, and even 6D BIM can start playing a component in the process. In addition, there is an initiative across the globe to minimise pollution in building. To a considerable degree, this is due to supply chain inefficiencies, clashes, and reworking. As a result of operating collaboratively in a BIM setting, all this becomes, to a significant degree, less likely to set the juncture for an improved tomorrow.

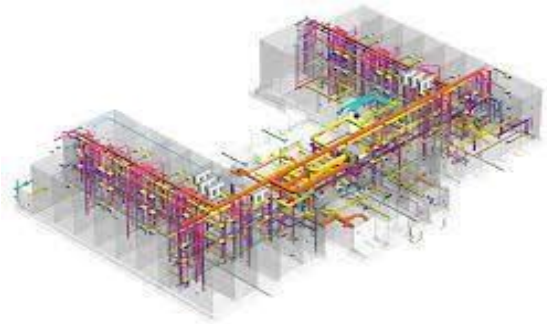


Figure 1.2 the Future of BIM

1.5 ASTA POWER PROJECT

Power project BIM is an interactive module for Powerproject that helps you to quickly relate the obligations of your project plan to the 3D Model Components for 4D planning with one relevance. This makes it superlative for tendering and tracking of progress. By integrating 3D models with scheduling resources in a single framework for powerful 4D preparation, Power project BIM allows you to: Identify problems that might not be perceptible via traditional schedules

- Run scenarios to evaluate the feasibility of execution and find the preeminent solutions
- Distinguish the impact in the 3D view as you update the Gantt chart
- Study how the build progression will come into view at different project stages
- Integrate as-built information
- Generate better tenders, faster
- Visually analyze each stage of a project
- See the crash of updating the Gantt chart in 3D view
- Contrast planned versus actual progress in 3D
- Identify problems that are frequently hidden using traditional methods
- Run scenarios to approximate the feasibility of planned execution
- Optimized decision-making to help decrease the possibility of a major setback

1.6 PRIMAVERA

The majority of Oracle's Primavera P6 Enterprise Project Portfolio Management is strong, vigorous and easy-to-use elucidation for prioritisation, preparation, management and assessment of projects, programmes and portfolios. Oracle's Primavera P6 EPPM is a cloud-based software system that serves the global network of Oracle Project Portfolio Management professionals and guarantees the security, scalability, consistency and maintenance of one of the world's largest cloud providers. It offers a 100% web-based approach for managing projects of any size, adapts to differing degrees of difficulty through projects, and astutely scales to address the demands of all positions, tasks, or ability levels within your company and your venture team.

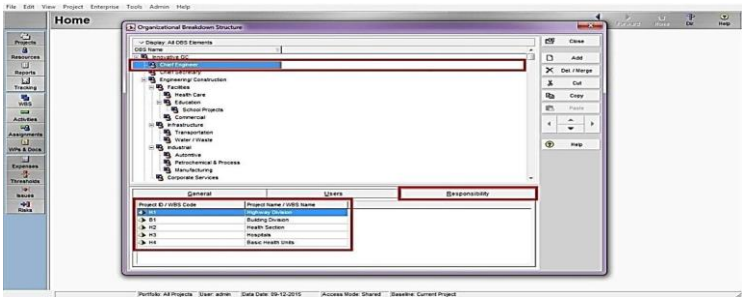


Figure: = 1.3 Activities of the Project

1.7 PROJECT INFORMATION

Project Name	NON-MPT BUILDING
Building	Residential
Client	Pak Arab Refinery Co-operation
Consultant	KERUI PETROLEUM
Design Consultant	KERUI PETROLEUM
Location	Kot Bahadur Shah, Jhang, Pakistan
Total Covered Area	453104 Sq.ft
Start time	Jan, 14 2018
Expected Duration	08 Months
Purposes	For Residents
Number of stories	Ground Floor

METHODS

READ AND INTERPRET DESIGN

⇩

TAKE OF QUANTITIES AND MAKING BOQ

⇩

LEARNING AND EXAMINE PRIMAVERA P6 (SAMPLE PROJECT)

⇩

DEVELOPMENT OF WORK SCHEDULE ON PRIMAVERA P6

⇩

DEVELOPMENT OF 3D MODEL ON AUTODESK REVIT

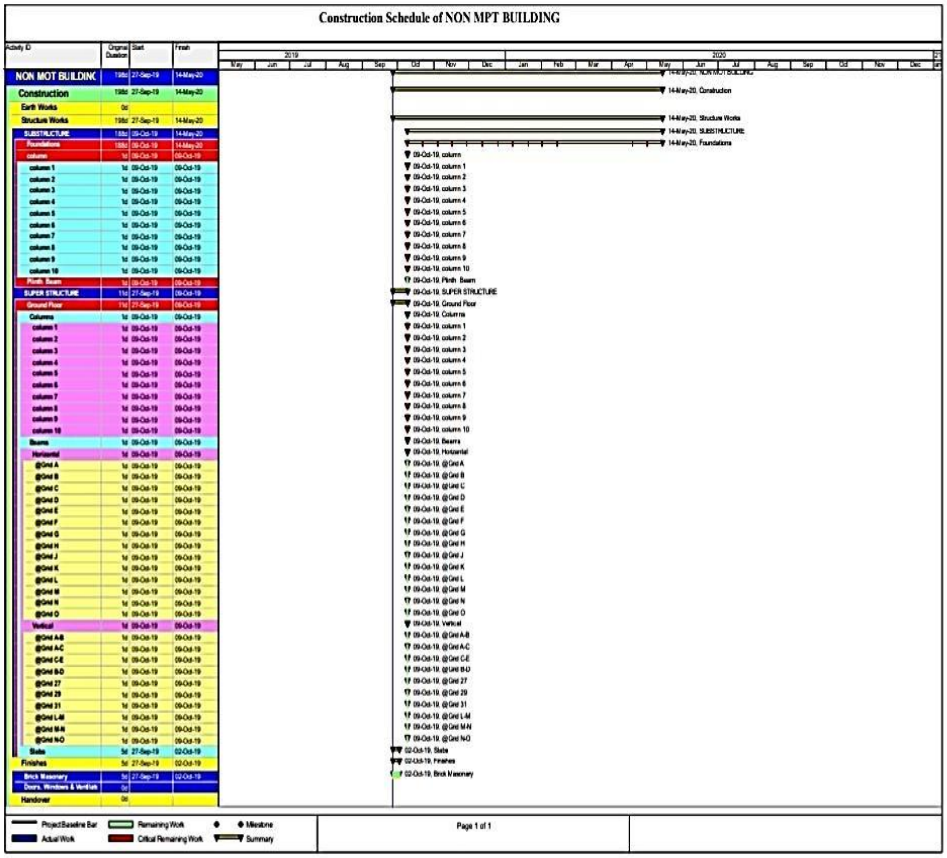
⇩

MAKING 4D MODELS BY INTEGRATING PRIMAVERA P6 & REVIT

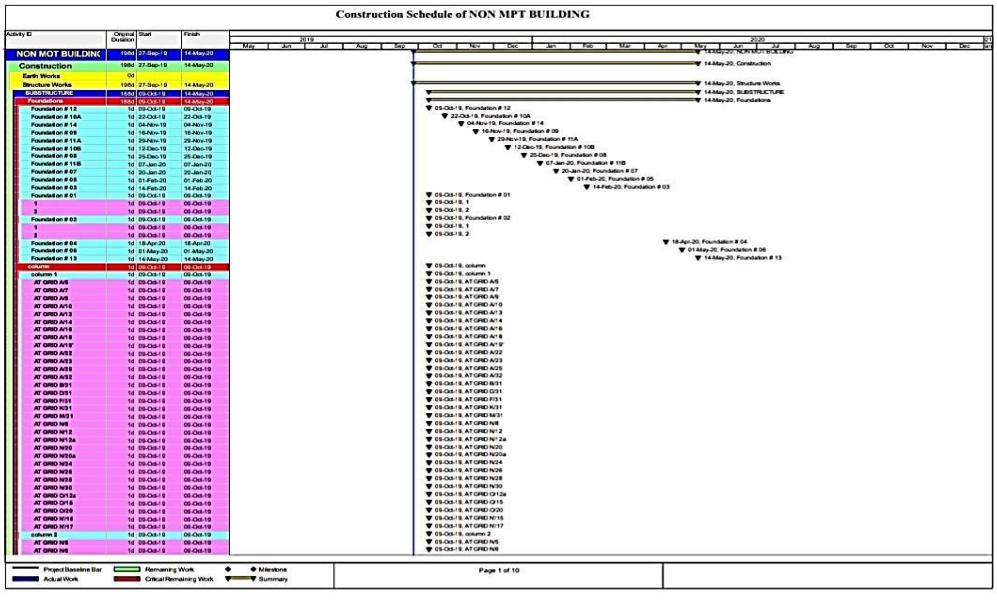
II. RESULTS

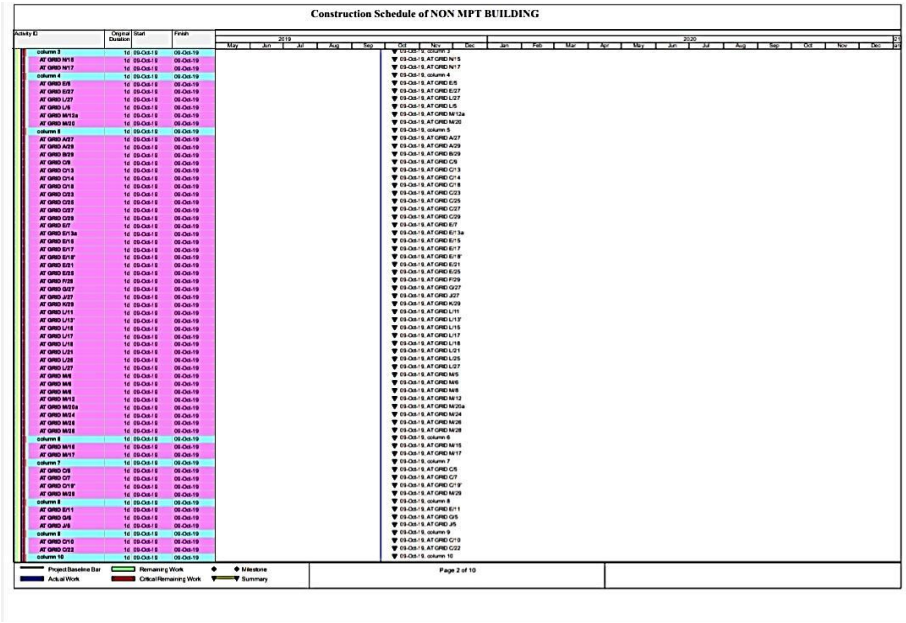
A. PRIMAVERA

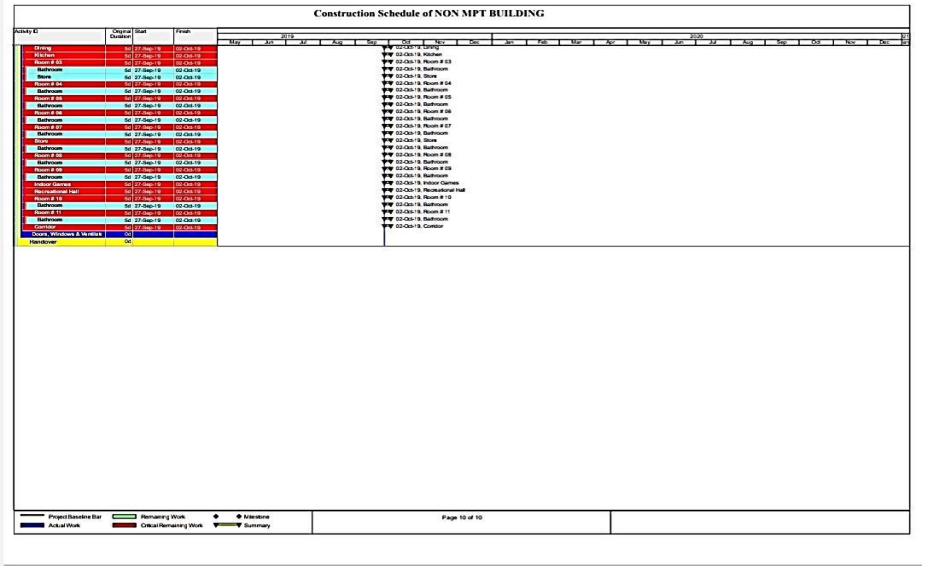
1) PRIMAVERA DETAILED SUMMARY



2) *SUMMARY OF PRIMAVERA WORKING*

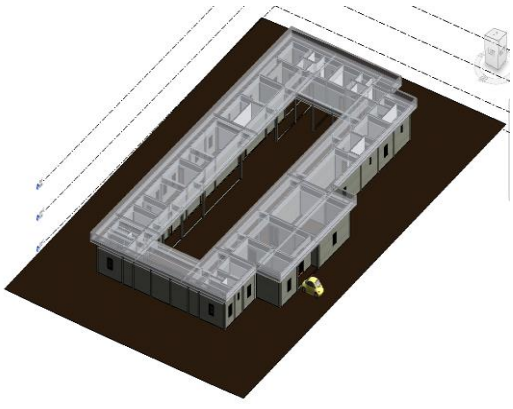






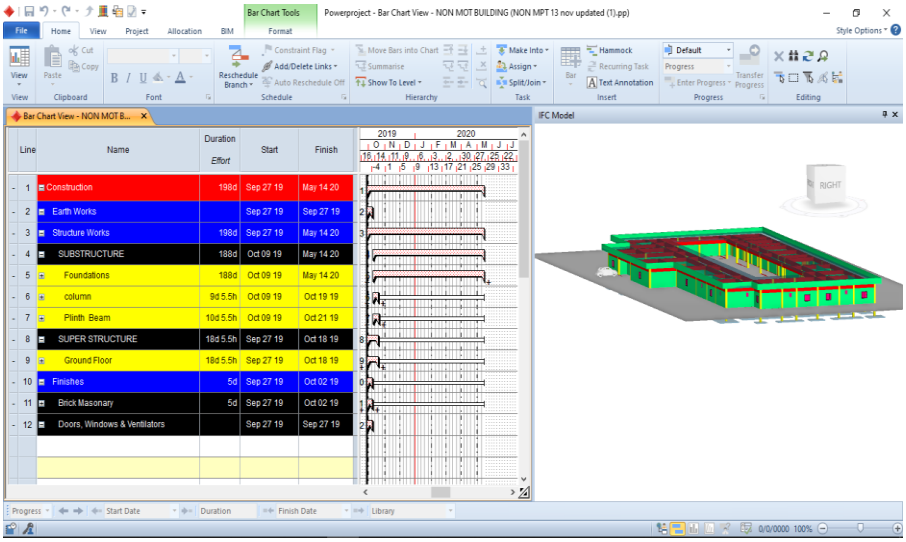
B. *REVIT*

1) *3D MODEL ON REVIT*

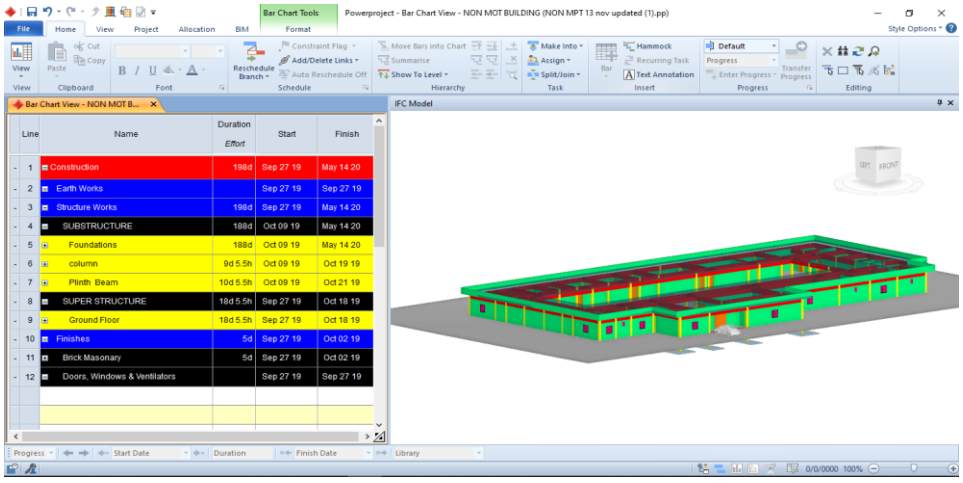


C. POWER PROJECT

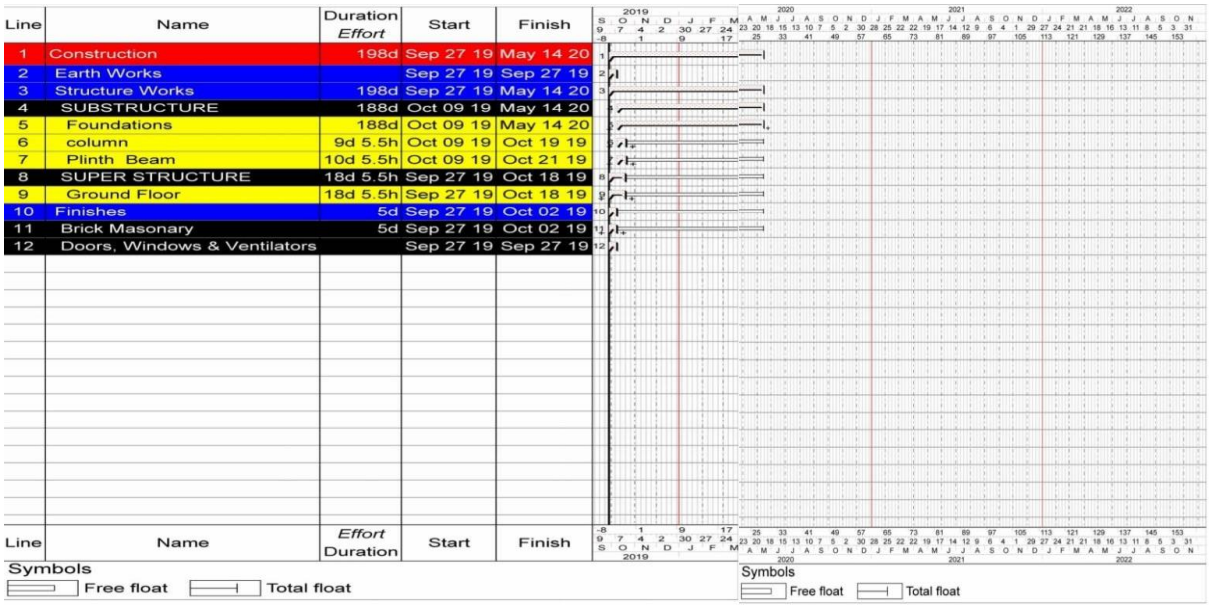
1) DETAILED SUMMARY OF POWERPROJECT



2) TABULAR AND MODAL VIEW

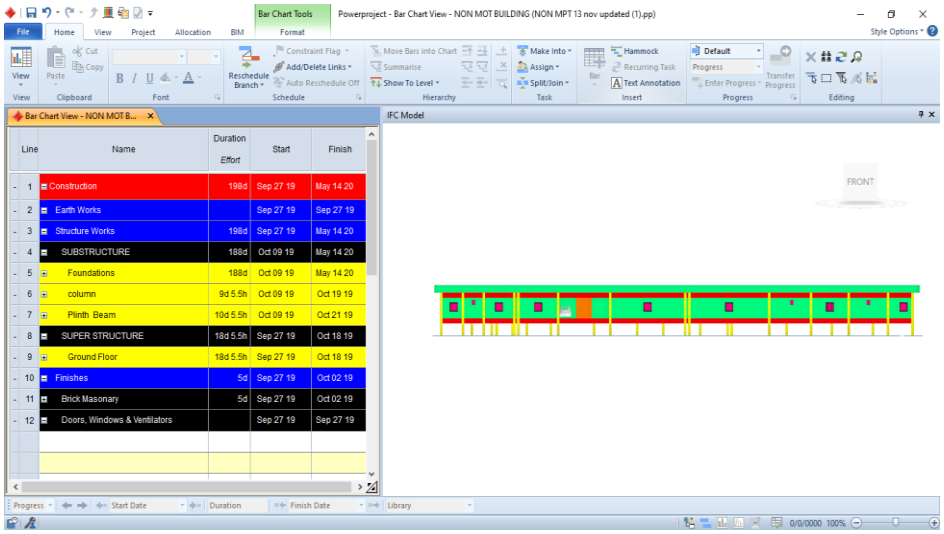


3) TABULAR AND GANTT CHART

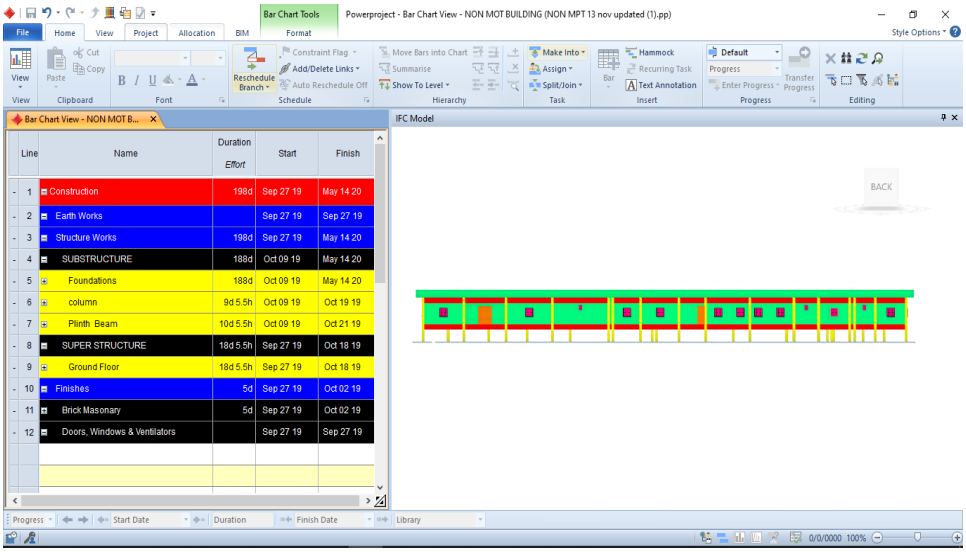


4) *Views*

5) *Front View*



6) *Back View*



III. CONCLUSIONS

Inside 4D Planning, A 3d Model of a project container is integrated with the construction schedule in a single application to generate a robust 4D Environment. It is after that step in project planning. 4D Planning contains the visual power of 3d Model. It identifies problems. It helps in effortless communiqué; with 4D Planning, the individual becomes an enhanced planner. Getting started is tremendously simple. Applications akin to Asta Power Project construct things easy to get done with 4D Planning. In Asta Power Project, solitary can easily drag and drop objects; Searches are completed efficiently in Power Project, It reflects how to build progression works, It uses various colors to differentiate flanked by the elements of the structure such as Slabs, beams, and columns in case of the building project. The client can easily export animation of harmonization. You can participate in your project timeline from initiation to completion. Camera Movement beginning different perspective, Compared planned and actual, better progress reporting. A client can manage model revisions, add additional models, Filter a program, Access IFC Properties, and Improve Efficiency

IV. RECOMMENDATIONS

- With the help of BIM integrated with primavera p6 through Power Project, all construction firms recommend that all construction firms, either contractors or consultants, do Planning before the execution of work.
- Client satisfaction

- At any stage, if the project, we can trace the timeline with the 5D & 6D approach of cost & recourse loading for our long-lead items.

REFERENCES

[1]. "About the National BIM Standard-United States." National Institute of Building Sciences. 2010. Web. Apr. 2010. <buildingsmartalliance.org>.
[2]. Becerik-Gerber, Burcin, and Samara Rice. "The Perceived Value of Building Information Modeling in the U.S. Building Industry." Journal of Information Technology in Construction 15 (2010): 185-201. Feb. 2010. Web. Sept. 2010. <itcon.org>.
[3]. Eastman, Chuck, Paul Tiecholz, Rafael Sacks, and Kathleen Liston. BIM Handbook. New Jersey: John Wiley & Sons, 2008. Print.
[4]. Grant, Jason, and Michael Coviello. "Autodesk® Revit® API Examples from Real Office Applications." 2009. Web. May 2010. <autodesk.com>.
[5]. Hajian, Hamid, and Burcin Becerik-Gerber. "A Research Outlook for Real-time Project Information Management by Integrating Advanced Field Data Acquisition Systems and Building Information Modeling." The University of South California. Sept. 2009. Web. July 2010. <usc.edu>.
[6]. Reinhardt, Jan. "Appendix C: BIM Tools Matrix." The Contractor's Guide to BM. 2nd ed. AGC of America, 2009. 57-67. Print.
[7]. Salazar, Guillermo F. "Building Information Modeling." BIM CE590 Lecture Series.
[8]. Worcester Polytechnic Institute, Worcester. Jan. 2010. Lecture.