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№ 8930

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October 3, 2022

ICBIIEM 2022
International Conference on Business Intelligence, Industrial Engineering and Management
28 – 29 November 2022

4D AND 5D PROJECT MANAGEMENT PLANNING AND SCHEDULING BY BIM APPLICATION OF PARCO STATION

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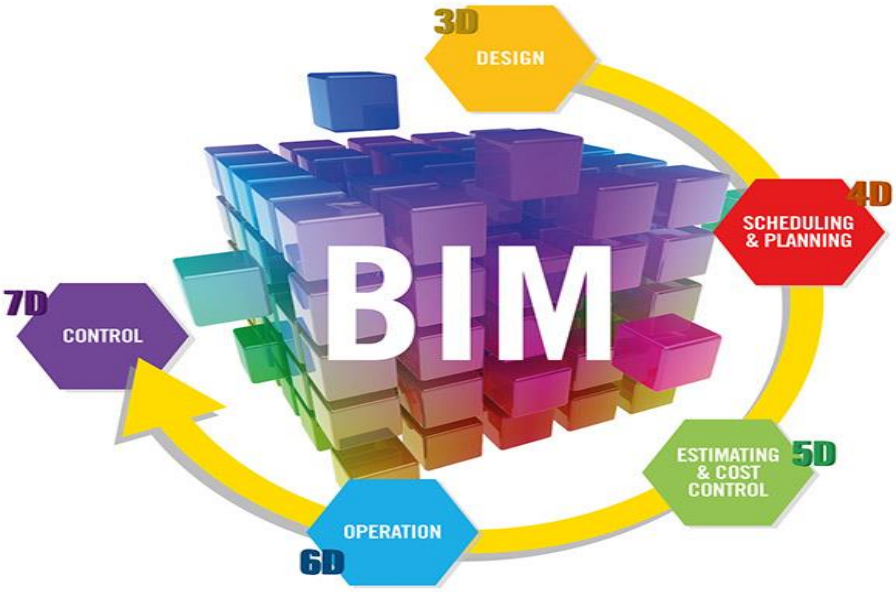
ABSTRACT

4D and 5D Planning and Scheduling of the Construction Project Using Project Management Software in contrast with the past, presently construction industry concerned about optimal execution of project. For this to achieve, the construction industry needs a systematic planning, scheduling and management process which in turn permit the overall optimization of cost, time and resources. Usage of conventional project management software tools for explaining the status of the vast projects to the various parties involving in the construction is not up to the mark. The traditional construction industry's production efficiency is comparatively low and the waste of resources is serious, which has seriously hindered the construction industry. The planning and scheduling can be integrated on a software to create a 4D and 5D view of the project. With the application of BIM 4D and 5D in the planning phase of the construction project, the level of meticulous management in the construction stage being improved effectively, the waste of the project being reduced and the construction quality and construction progress being ensured.

Keywords: Scheduling, Systematic planning, BIM ,construction quality

INTRODUCTION

Building information modelling is the process of developing a three-dimensional (3D) design platform that enables real-time participation from the architect and engineering experts. BIM is a ground-breaking strategy that is thought to be more likely to be used as a tool to increase the speed of any design and construction operations at every single stage of a project as well as to improve collaboration between various parties, control the cost of altered order, and minimise potential inefficiencies so that overall productivity can be sped up. Numerous new terminologies and ideas have been used, including the discovery of various BIM applications like 4D and 5D. In this context, the term "D" refers to a dimension with a number of uses in the building sector. 3D BIM includes the height, length and width, 4D BIM includes 3D plus the factor of time, which in the context of BIM used in construction planning implies, the project schedule. 5D BIM includes 4D plus cost estimation .



OBJECTIVE:

- Enhances site planning and scheduling optimization.
- Improved visualization and productivity of projects.
- Assisting companies by undertaking their one of the project to implement 4D planning and scheduling
- Helps in developing budget estimation accurately.

SCOPE:

Implementing 5D & 4D Planning and scheduling with the help of ASTA PowerProject OR Autodesk Navisworks and enables our team member to perform these task read and interpret drawings, take off quantities and making B.O.Q, development of work schedule and development of 3D model.

LITERATURE REVIEW

BUILDING INFORMATION MODELING

There was a time when we used pencil, paper for creating drawings and complex drawings would be the base of a construction planning. It would be a tiring process but things have changes it is now all about BIM or Building Information Modeling has part of a construction industry for some time now. BIM is model based process for planning, designing, building and managing buildings and infrastructure. It connects AEC professionals in more efficiently design, build and operate infrastructure through BIM. BIM is more than just digital 2D or 3D model. It is a process of designing a building by collaborating using one coherent system of computer models rather than a separate sets of drawings. If an element in a model is changed then BIM changes it in all views that display that element. Structural engineers, architects and contractors can work more collaboratively accessing and updating the design, the information is captured in model and remains there consistent and

coordinated. Information is heart of BIM at any time in the life cycle of the project the information is there the helps to reduce the time consuming errors. You can use the information in the model to improve your design before it is built. Realistic visualization can get you immediate approvals and buy-ins. BIM does not solely refer to buildings, but to all sectors that have to do with construction including: roads, railway, bridges, structures, architectures, topography etc.

FROM CAD TO BIM:

In the late 80's due to the advancement in graphics of computer AEC industry adopted 2D CAD to replace hand drawings to create engineering drawings. The fundamental representation of 2D of engineering information remained the same but the tool was changed to 2D CAD software on computer so, we can say 2D CAD was just digitization of engineering drawings. When 3D CAD was introduced architects used it as design tool to express his or her design directly in virtual 3D space. But for civil engineers the design task is more than just geometric shapes therefore 3D CAD was not a sufficient design tools for engineers but it was helpful. In 90's research from Stanford University started to promote about 4D CAD applications. In a 4D CAD, 3D CAD model components integrates with time or schedule related information to simulate the construction process. In early 2000 BIM was introduced as a new technology in the industry of AEC. It is a model-based approach for better way of managing engineering information needed for collaboration and decision-making with BIM technology we can do virtual construction in the digital space first and when we are satisfied with our planned process outcomes, we can then engage in real construction in the fig below you can see the real construction followed the virtual construction very well. In BIM engineering informations are managed in model. This model contains elements which correspond to unique real objects or components in physical world. Unlike the 2D drawings information management in traditional methods, this model based approach significantly improves the information management consistency. If you modify a 2D drawing, you need to make sure that all other drawings related to that 2D drawing are also modified to maintain information consistency and it can become quite complicated especially in large projects. In BIM model the information is managed in the 3D BIM model and all the needed 2D drawings are automatically generated by the computers any modification made in the 3D BIM model can be updated to the 2D drawings without any efforts or time consuming task with BIM there is no doubt contains much better product information management is supported and a lot better process of information management will come.

METHODOLOGY

STEP 1:

Reading and interpreting drawings of project and then performing quantity take-off and BBS (Bar Bending Schedule) by using drawings of project after quantity take off and bar bending schedule local market survey for the rates of materials

STEP 2:

CREATING 3D MODEL PROJECT MODEL CAN BE DIRECTLY DESIGNED IN THE AUTODESK REVIT. HOWEVER IF THE ARCHITECT IS USING AUTOCAD FOR DESIGNING THE ARCHITECTURAL DRAWING THAN 2D CAD DRAWING CAN BE IMPORTED TO THE REVIT USING LINK CAD OPTION AND LATER MODEL IS CREATED.

STEP 3:

EXPORT 3D MODEL FOR ASTA POWERPROJECT. AFTER CREATING THE 3D MODEL IN THE AUTODESK REVIT FOR THE PREPARATION OF 4D MODEL.

STEP 4:

INITIATING SCHEDULING PROCESS ASTA POWERPROJECT IS USED AS THE SCHEDULING TOOL. THE PROJECT IS SCHEDULED BASED ON THE ACTIVITIES OF THE PROJECT, SHOWING THE START AND COMPLETION DATES.

STEP 5:

FOR CREATION OF 4D MODEL, ACTIVITIES FROM THE SCHEDULE ARE LINKED WITH MODEL ELEMENTS.

STEP 6:

FOR CREATION OF 5D MODEL, ACTIVITIES FROM THE SCHEDULE ARE LINKED WITH MODEL ELEMENTS WITH COST ALSO.

STEP 7:

THE 4D AND 5D VISUALIZATION OF PROJECT IS SEEN THROUGH THE STARTING THE SIMULATION. THE AMOUNT OF WORK DONE ON THE VARIOUS WORK PACKAGES COULD BE SEEN IN THE 3D VIEW. THE PROJECT IS UPDATED AS PROGRESS INFORMATION BECOMES AVAILABLE FROM CORRESPONDING SCHEDUL

RESULTS

1 DRAWINGS:

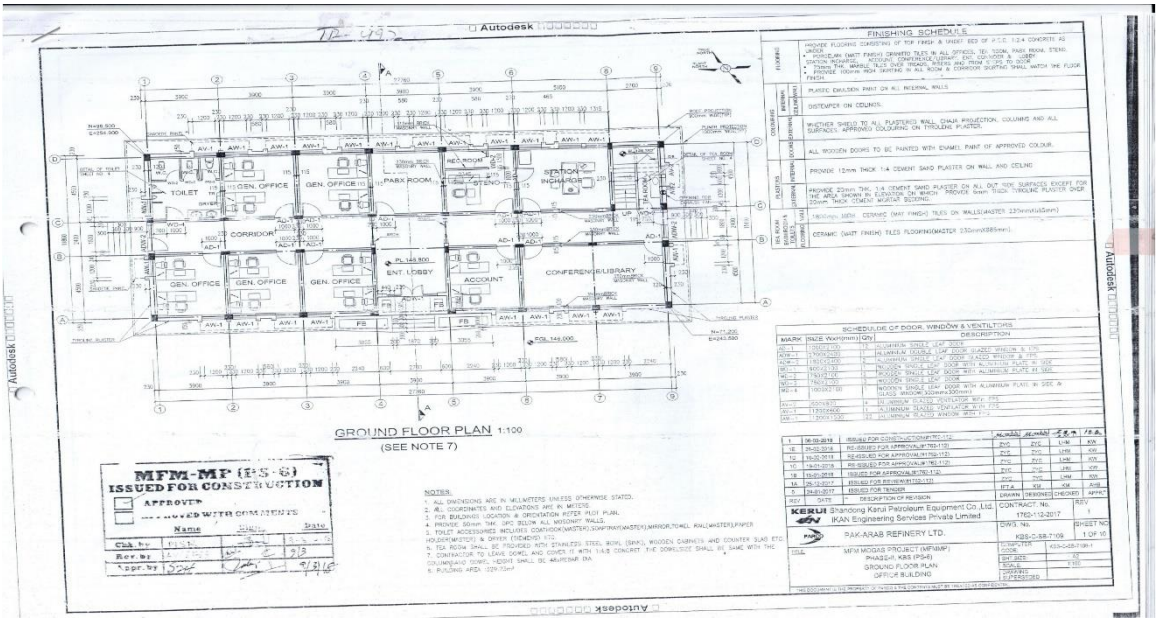


Figure 1 Ground Floor Plan

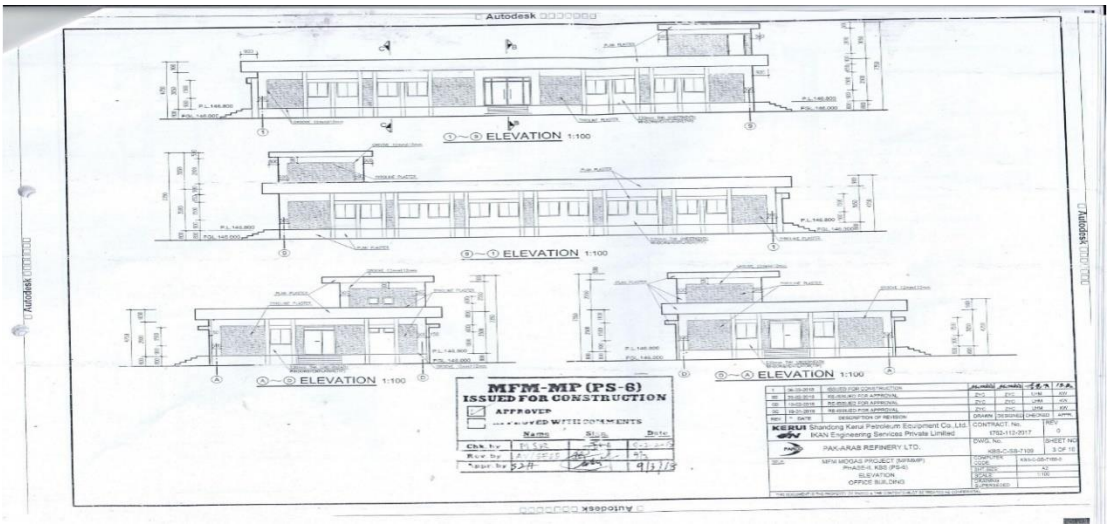


Figure 2 Elevations

REVIT

3D MODEL ON REVIT:

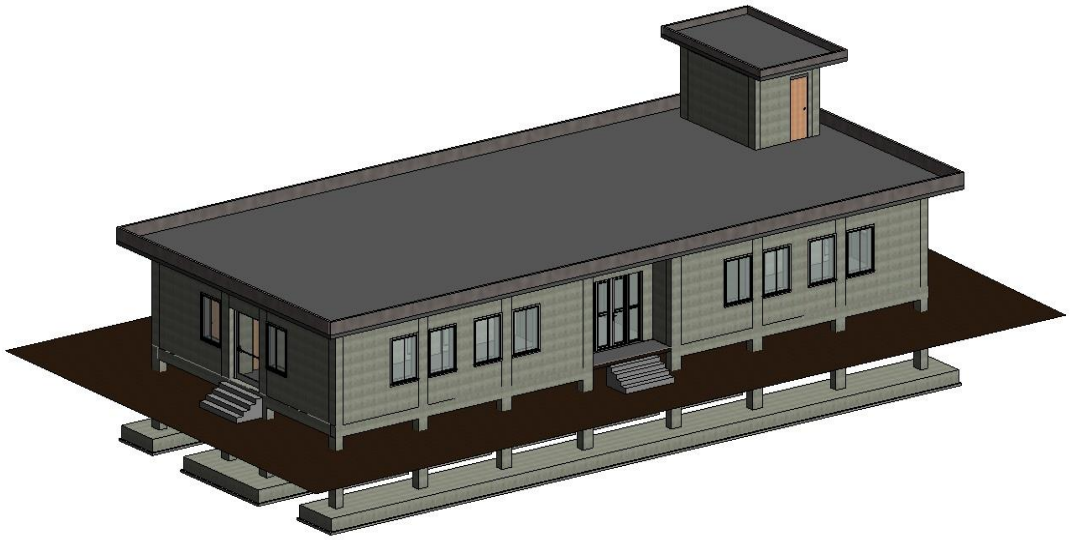


Figure 3 3D model

VIEWS

Figure 4 Front View

Figure 5 Back View

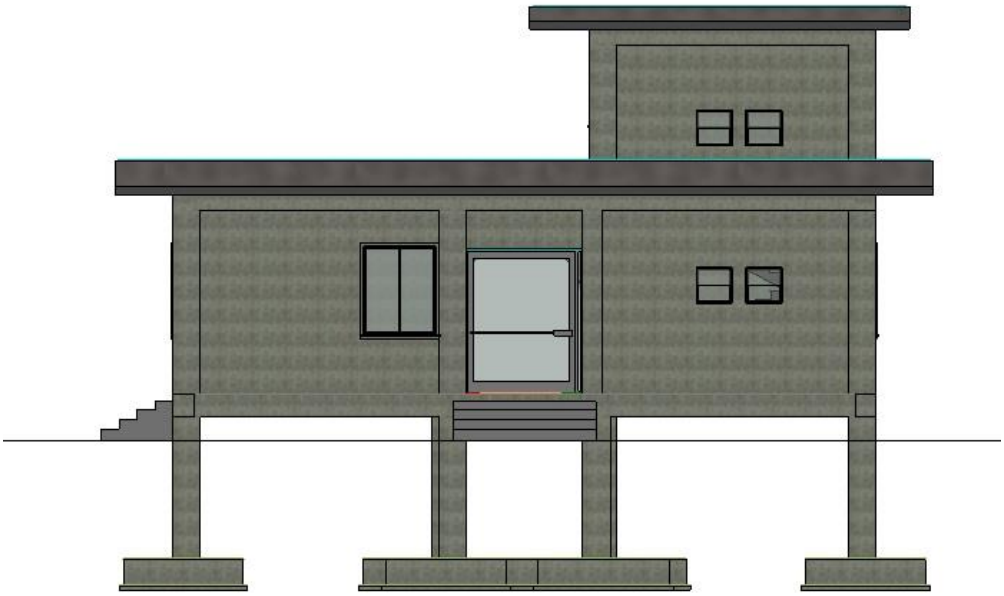
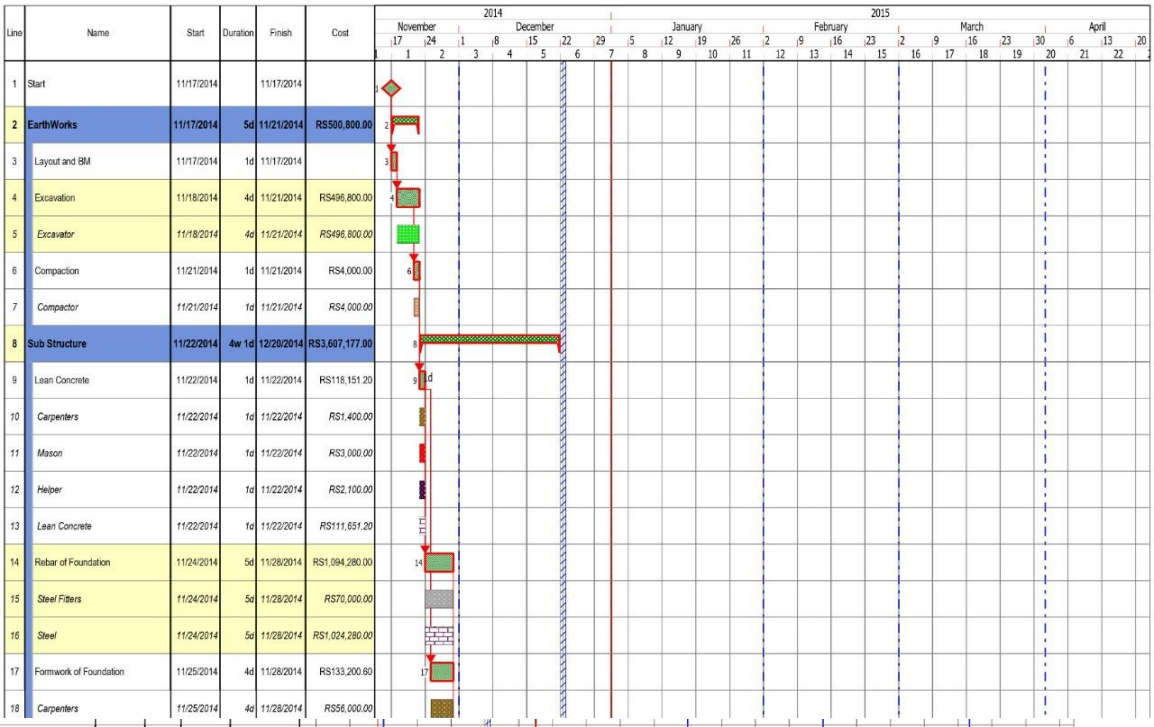


Figure 6 Right View

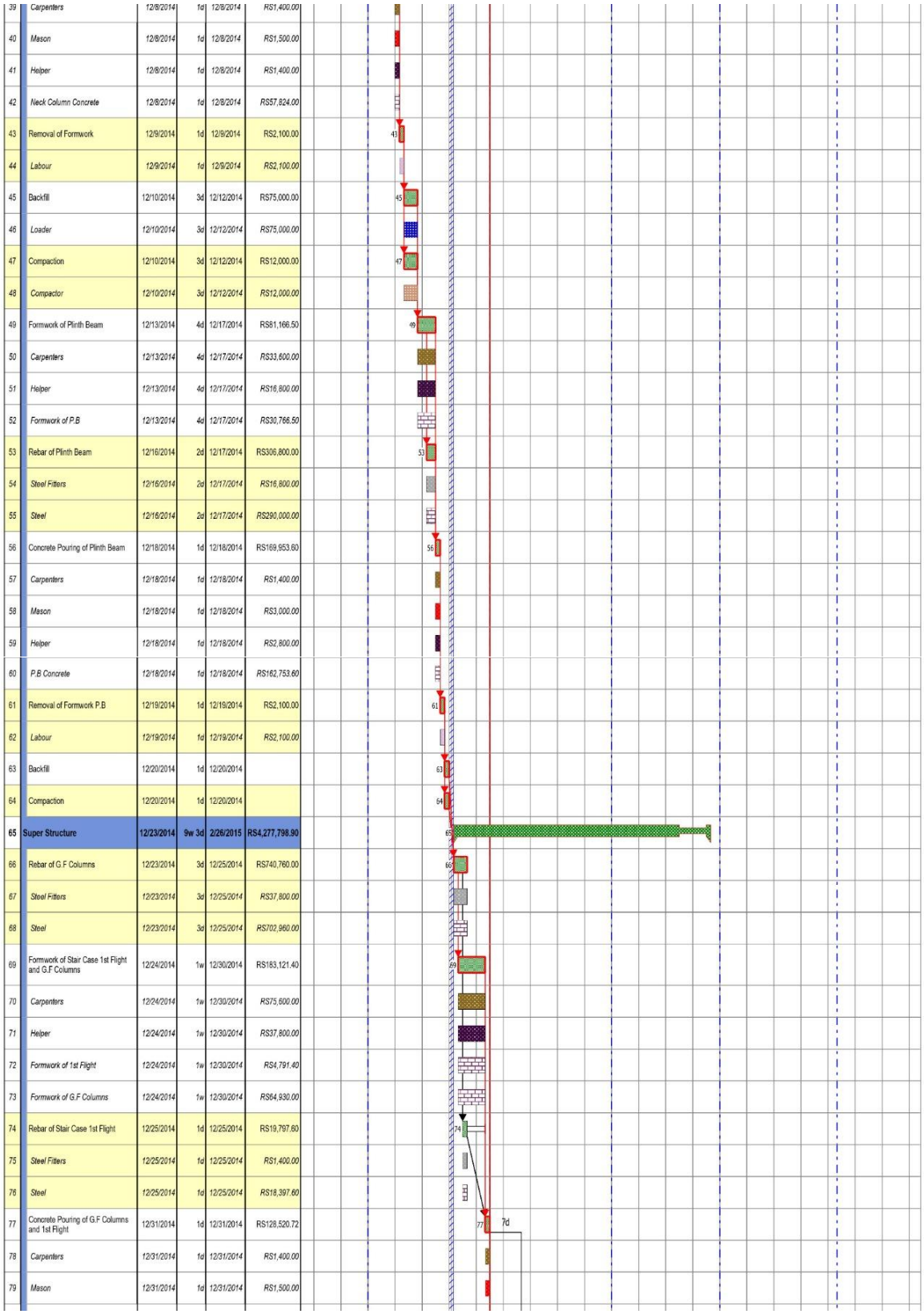
Figure 7 Left View

POWER PROJECT:

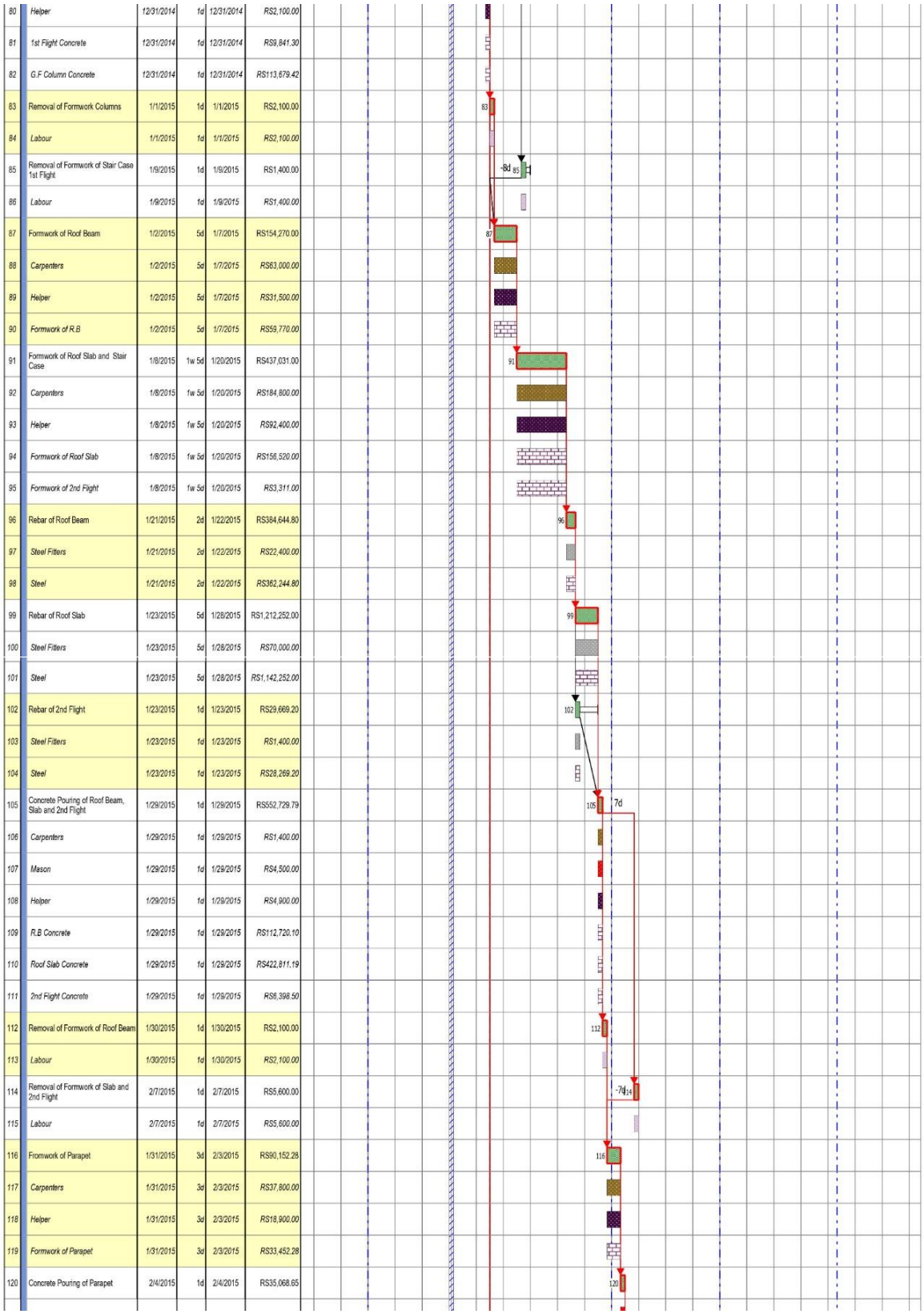
DETAILED SUMMARY OF POWERPROJECT



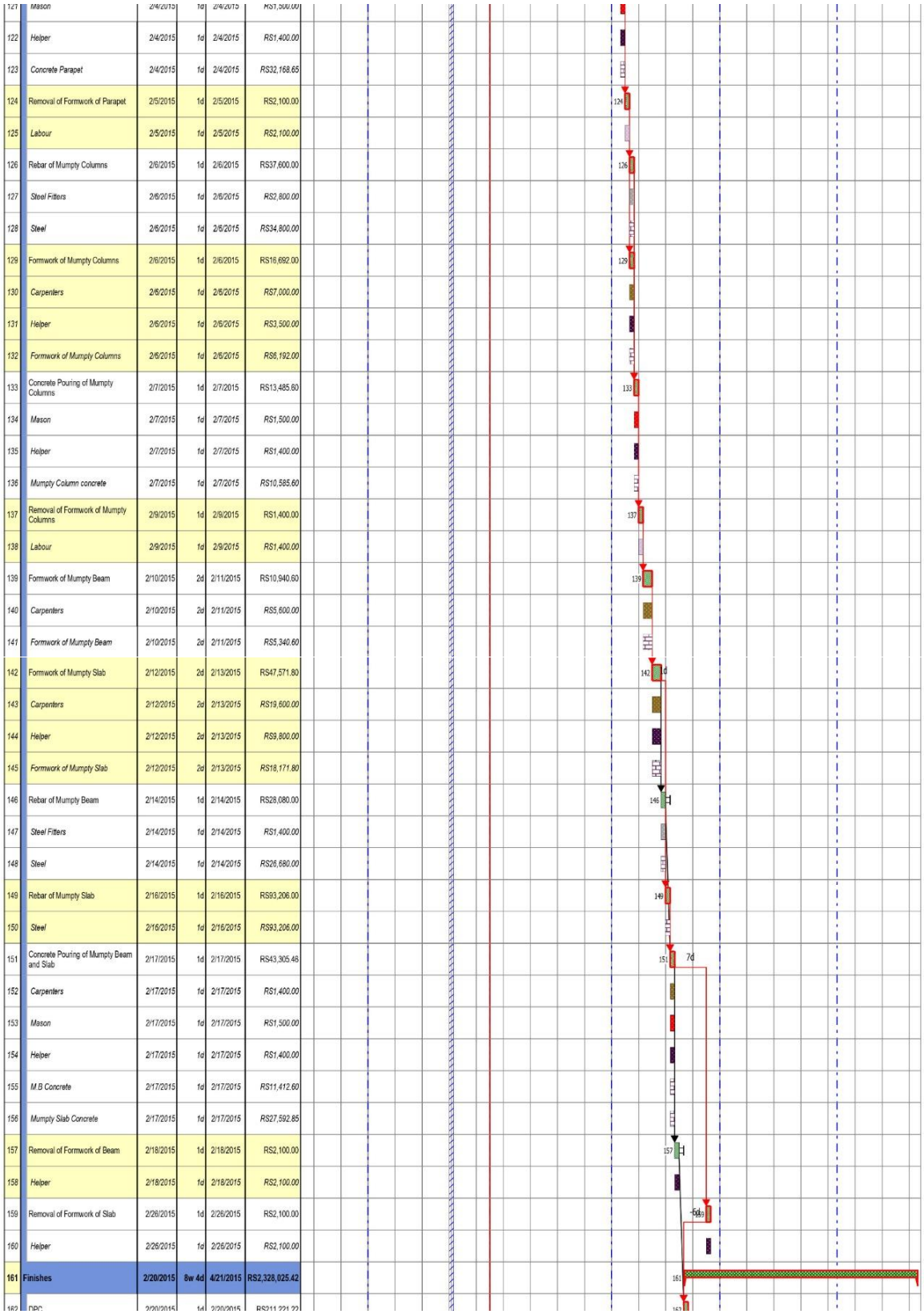
Line	Name	Start	Duration	Finish	Cost
1	Start	11/17/2014		11/17/2014	
2	**EarthWorks**	**11/17/2014**	**5d**	**11/21/2014**	**RS500,800.00**
3	Layout and BM	11/17/2014	1d	11/17/2014	
4	Excavation	11/18/2014	4d	11/21/2014	RS496,800.00
5	*Excavator*	*11/18/2014*	*4d*	*11/21/2014*	*RS496,800.00*
6	Compaction	11/21/2014	1d	11/21/2014	RS4,000.00
7	*Compactor*	*11/21/2014*	*1d*	*11/21/2014*	*RS4,000.00*
8	**Sub Structure**	**11/22/2014**	**4w 1d**	**12/20/2014**	**RS3,607,177.00**
9	Lean Concrete	11/22/2014	1d	11/22/2014	RS118,151.20
10	*Carpenters*	*11/22/2014*	*1d*	*11/22/2014*	*RS1,400.00*
11	*Mason*	*11/22/2014*	*1d*	*11/22/2014*	*RS3,000.00*
12	*Helper*	*11/22/2014*	*1d*	*11/22/2014*	*RS2,100.00*
13	*Lean Concrete*	*11/22/2014*	*1d*	*11/22/2014*	*RS111,651.20*
14	Rebar of Foundation	11/24/2014	5d	11/28/2014	RS1,094,280.00
15	*Steel Fitters*	*11/24/2014*	*5d*	*11/28/2014*	*RS70,000.00*
16	*Steel*	*11/24/2014*	*5d*	*11/28/2014*	*RS1,024,280.00*
17	Formwork of Foundation	11/25/2014	4d	11/28/2014	RS133,200.60
18	*Carpenters*	*11/25/2014*	*4d*	*11/28/2014*	*RS56,000.00*
19	*Helper*	*11/25/2014*	*4d*	*11/28/2014*	*RS28,000.00*
20	*Formwork of Foundation*	*11/25/2014*	*4d*	*11/28/2014*	*RS49,200.60*
21	Concrete Pouring of Foundation	11/29/2014	1d	11/29/2014	RS765,642.70
22	*Carpenters*	*11/29/2014*	*1d*	*11/29/2014*	*RS1,400.00*
23	*Mason*	*11/29/2014*	*1d*	*11/29/2014*	*RS8,000.00*
24	*Helper*	*11/29/2014*	*1d*	*11/29/2014*	*RS3,500.00*
25	*Foundation Concrete*	*11/29/2014*	*1d*	*11/29/2014*	*RS754,742.70*
26	Removal of Formwork	12/1/2014	1d	12/1/2014	RS2,100.00
27	*Labour*	*12/1/2014*	*1d*	*12/1/2014*	*RS2,100.00*
28	Waterproofing of Foundation	12/2/2014	1d	12/2/2014	RS70,500.00
29	*Labour*	*12/2/2014*	*1d*	*12/2/2014*	*RS2,100.00*
30	*Polycot*	*12/2/2014*	*1d*	*12/2/2014*	*RS68,400.00*
31	Rebar of Neck Columns	12/3/2014	3d	12/5/2014	RS622,867.80
32	*Steel Fitters*	*12/3/2014*	*3d*	*12/5/2014*	*RS29,400.00*
33	*Steel*	*12/3/2014*	*3d*	*12/5/2014*	*RS593,467.60*
34	Formwork of Neck Columns	12/4/2014	3d	12/6/2014	RS89,190.80
35	*Carpenters*	*12/4/2014*	*3d*	*12/6/2014*	*RS37,800.00*
36	*Helper*	*12/4/2014*	*3d*	*12/6/2014*	*RS18,900.00*
37	*Formwork of Neck Columns*	*12/4/2014*	*3d*	*12/6/2014*	*RS32,490.80*
38	Concrete Pouring of Neck Columns	12/8/2014	1d	12/8/2014	RS62,124.00



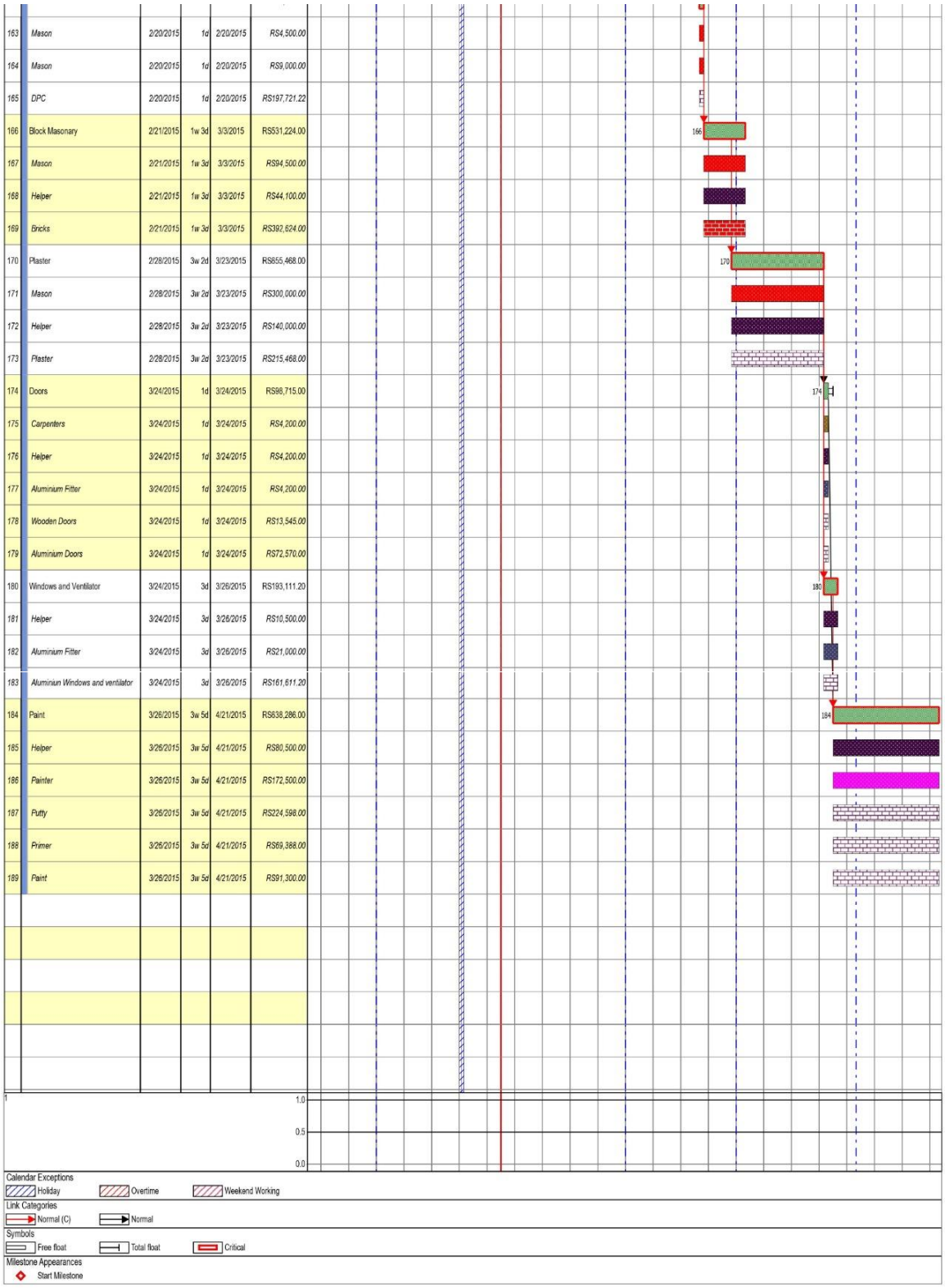
39	Carpenters	12/8/2014	1d	12/8/2014	RS1,400.00
40	Mason	12/8/2014	1d	12/8/2014	RS1,500.00
41	Helper	12/8/2014	1d	12/8/2014	RS1,400.00
42	Neck Column Concrete	12/8/2014	1d	12/8/2014	RS57,624.00
43	Removal of Formwork	12/9/2014	1d	12/9/2014	RS2,100.00
44	Labour	12/9/2014	1d	12/9/2014	RS2,100.00
45	Backfill	12/10/2014	3d	12/12/2014	RS75,000.00
46	Loader	12/10/2014	3d	12/12/2014	RS75,000.00
47	Compaction	12/10/2014	3d	12/12/2014	RS12,000.00
48	Compactor	12/10/2014	3d	12/12/2014	RS12,000.00
49	Formwork of Plinth Beam	12/13/2014	4d	12/17/2014	RS81,166.50
50	Carpenters	12/13/2014	4d	12/17/2014	RS33,600.00
51	Helper	12/13/2014	4d	12/17/2014	RS16,800.00
52	Formwork of P.B	12/13/2014	4d	12/17/2014	RS30,766.50
53	Rebar of Plinth Beam	12/16/2014	2d	12/17/2014	RS306,800.00
54	Steel Fitters	12/16/2014	2d	12/17/2014	RS16,800.00
55	Steel	12/16/2014	2d	12/17/2014	RS290,000.00
56	Concrete Pouring of Plinth Beam	12/18/2014	1d	12/18/2014	RS169,953.60
57	Carpenters	12/18/2014	1d	12/18/2014	RS1,400.00
58	Mason	12/18/2014	1d	12/18/2014	RS3,000.00
59	Helper	12/18/2014	1d	12/18/2014	RS2,800.00
60	P.B Concrete	12/18/2014	1d	12/18/2014	RS162,753.60
61	Removal of Formwork P.B	12/19/2014	1d	12/19/2014	RS2,100.00
62	Labour	12/19/2014	1d	12/19/2014	RS2,100.00
63	Backfill	12/20/2014	1d	12/20/2014	
64	Compaction	12/20/2014	1d	12/20/2014	
65	**Super Structure**	**12/23/2014**	**9w 3d**	**2/26/2015**	**RS4,277,798.90**
66	Rebar of G.F Columns	12/23/2014	3d	12/25/2014	RS740,760.00
67	Steel Fitters	12/23/2014	3d	12/25/2014	RS37,800.00
68	Steel	12/23/2014	3d	12/25/2014	RS702,960.00
69	Formwork of Stair Case 1st Flight and G.F Columns	12/24/2014	1w	12/30/2014	RS183,121.40
70	Carpenters	12/24/2014	1w	12/30/2014	RS75,600.00
71	Helper	12/24/2014	1w	12/30/2014	RS37,800.00
72	Formwork of 1st Flight	12/24/2014	1w	12/30/2014	RS4,791.40
73	Formwork of G.F Columns	12/24/2014	1w	12/30/2014	RS64,930.00
74	Rebar of Stair Case 1st Flight	12/25/2014	1d	12/25/2014	RS19,797.60
75	Steel Fitters	12/25/2014	1d	12/25/2014	RS1,400.00
76	Steel	12/25/2014	1d	12/25/2014	RS18,397.60
77	Concrete Pouring of G.F Columns and 1st Flight	12/31/2014	1d	12/31/2014	RS128,520.72
78	Carpenters	12/31/2014	1d	12/31/2014	RS1,400.00
79	Mason	12/31/2014	1d	12/31/2014	RS1,500.00



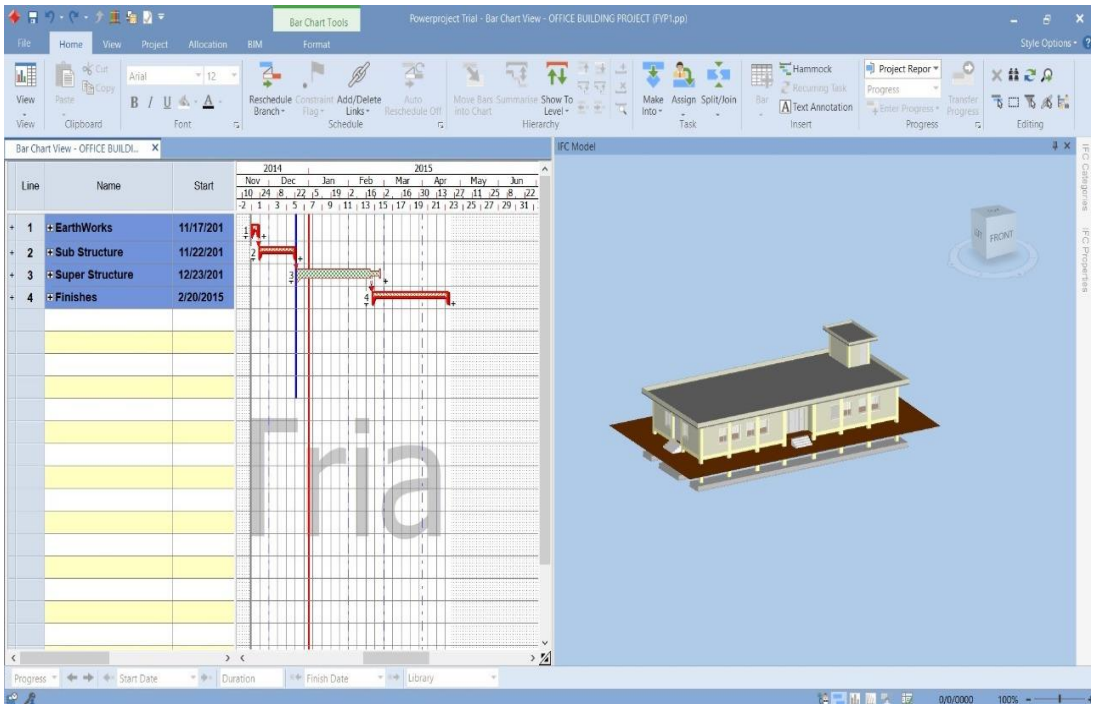
80	Helper	12/31/2014	1d	12/31/2014	RS2,100.00
81	1st Flight Concrete	12/31/2014	1d	12/31/2014	RS9,841.30
82	G.F Column Concrete	12/31/2014	1d	12/31/2014	RS113,679.42
83	Removal of Formwork Columns	1/1/2015	1d	1/1/2015	RS2,100.00
84	Labour	1/1/2015	1d	1/1/2015	RS2,100.00
85	Removal of Formwork of Stair Case 1st Flight	1/9/2015	1d	1/9/2015	RS1,400.00
86	Labour	1/9/2015	1d	1/9/2015	RS1,400.00
87	Formwork of Roof Beam	1/2/2015	5d	1/7/2015	RS154,270.00
88	Carpenters	1/2/2015	5d	1/7/2015	RS63,000.00
89	Helper	1/2/2015	5d	1/7/2015	RS31,500.00
90	Formwork of R.B	1/2/2015	5d	1/7/2015	RS59,770.00
91	Formwork of Roof Slab and Stair Case	1/8/2015	1w 5d	1/20/2015	RS437,031.00
92	Carpenters	1/8/2015	1w 5d	1/20/2015	RS184,800.00
93	Helper	1/8/2015	1w 5d	1/20/2015	RS92,400.00
94	Formwork of Roof Slab	1/8/2015	1w 5d	1/20/2015	RS156,520.00
95	Formwork of 2nd Flight	1/8/2015	1w 5d	1/20/2015	RS3,311.00
96	Rebar of Roof Beam	1/21/2015	2d	1/22/2015	RS384,644.80
97	Steel Fitters	1/21/2015	2d	1/23/2015	RS22,400.00
98	Steel	1/21/2015	2d	1/22/2015	RS362,244.80
99	Rebar of Roof Slab	1/23/2015	5d	1/28/2015	RS1,212,252.00
100	Steel Fitters	1/23/2015	5d	1/28/2015	RS70,000.00
101	Steel	1/23/2015	5d	1/28/2015	RS1,142,252.00
102	Rebar of 2nd Flight	1/23/2015	1d	1/23/2015	RS29,669.20
103	Steel Fitters	1/23/2015	1d	1/23/2015	RS1,400.00
104	Steel	1/23/2015	1d	1/23/2015	RS28,269.20
105	Concrete Pouring of Roof Beam, Slab and 2nd Flight	1/29/2015	1d	1/29/2015	RS552,729.79
106	Carpenters	1/29/2015	1d	1/29/2015	RS1,400.00
107	Mason	1/29/2015	1d	1/29/2015	RS4,500.00
108	Helper	1/29/2015	1d	1/29/2015	RS4,900.00
109	R.B Concrete	1/29/2015	1d	1/29/2015	RS112,720.10
110	Roof Slab Concrete	1/29/2015	1d	1/29/2015	RS422,811.19
111	2nd Flight Concrete	1/29/2015	1d	1/29/2015	RS8,398.50
112	Removal of Formwork of Roof Beam	1/30/2015	1d	1/30/2015	RS2,100.00
113	Labour	1/30/2015	1d	1/30/2015	RS2,100.00
114	Removal of Formwork of Slab and 2nd Flight	2/7/2015	1d	2/7/2015	RS5,600.00
115	Labour	2/7/2015	1d	2/7/2015	RS5,600.00
116	Fromwork of Parapet	1/31/2015	3d	2/3/2015	RS90,152.28
117	Carpenters	1/31/2015	3d	2/3/2015	RS37,800.00
118	Helper	1/31/2015	3d	2/3/2015	RS18,900.00
119	Formwork of Parapet	1/31/2015	3d	2/3/2015	RS33,452.28
120	Concrete Pouring of Parapet	2/4/2015	1d	2/4/2015	RS35,068.65

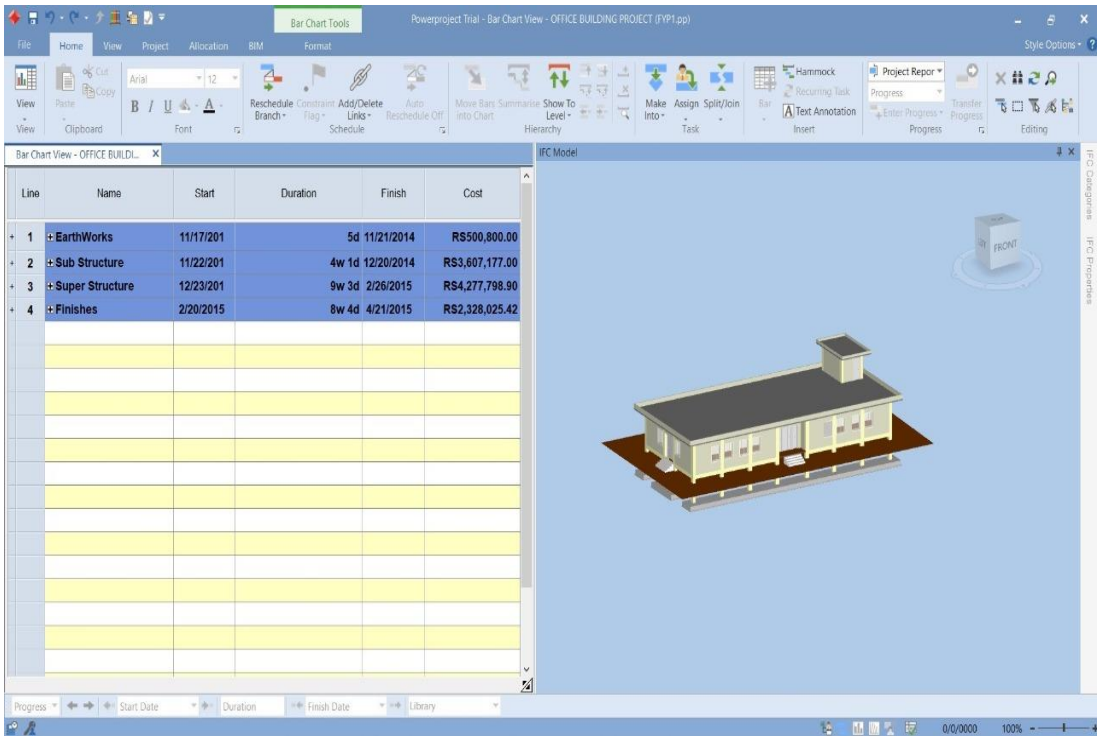


122	Helper	2/4/2015	1d	2/4/2015	RS1,400.00
123	Concrete Parapet	2/4/2015	1d	2/4/2015	RS32,168.65
124	Removal of Formwork of Parapet	2/5/2015	1d	2/5/2015	RS2,100.00
125	Labour	2/5/2015	1d	2/5/2015	RS2,100.00
126	Rebar of Mumpty Columns	2/6/2015	1d	2/6/2015	RS37,600.00
127	Steel Fitters	2/6/2015	1d	2/6/2015	RS2,800.00
128	Steel	2/6/2015	1d	2/6/2015	RS34,800.00
129	Formwork of Mumpty Columns	2/6/2015	1d	2/6/2015	RS16,692.00
130	Carpenters	2/6/2015	1d	2/6/2015	RS7,000.00
131	Helper	2/6/2015	1d	2/6/2015	RS3,500.00
132	Formwork of Mumpty Columns	2/6/2015	1d	2/6/2015	RS6,192.00
133	Concrete Pouring of Mumpty Columns	2/7/2015	1d	2/7/2015	RS13,485.60
134	Mason	2/7/2015	1d	2/7/2015	RS1,500.00
135	Helper	2/7/2015	1d	2/7/2015	RS1,400.00
136	Mumpty Column concrete	2/7/2015	1d	2/7/2015	RS10,585.60
137	Removal of Formwork of Mumpty Columns	2/9/2015	1d	2/9/2015	RS1,400.00
138	Labour	2/9/2015	1d	2/9/2015	RS1,400.00
139	Formwork of Mumpty Beam	2/10/2015	2d	2/11/2015	RS10,940.60
140	Carpenters	2/10/2015	2d	2/11/2015	RS5,600.00
141	Formwork of Mumpty Beam	2/10/2015	2d	2/11/2015	RS5,340.60
142	Formwork of Mumpty Slab	2/12/2015	2d	2/13/2015	RS47,571.80
143	Carpenters	2/12/2015	2d	2/13/2015	RS19,600.00
144	Helper	2/12/2015	2d	2/13/2015	RS9,800.00
145	Formwork of Mumpty Slab	2/12/2015	2d	2/13/2015	RS18,171.80
146	Rebar of Mumpty Beam	2/14/2015	1d	2/14/2015	RS28,080.00
147	Steel Fitters	2/14/2015	1d	2/14/2015	RS1,400.00
148	Steel	2/14/2015	1d	2/14/2015	RS26,680.00
149	Rebar of Mumpty Slab	2/16/2015	1d	2/16/2015	RS93,206.00
150	Steel	2/16/2015	1d	2/16/2015	RS93,206.00
151	Concrete Pouring of Mumpty Beam and Slab	2/17/2015	1d	2/17/2015	RS43,305.46
152	Carpenters	2/17/2015	1d	2/17/2015	RS1,400.00
153	Mason	2/17/2015	1d	2/17/2015	RS1,500.00
154	Helper	2/17/2015	1d	2/17/2015	RS1,400.00
155	M.B Concrete	2/17/2015	1d	2/17/2015	RS11,412.60
156	Mumpty Slab Concrete	2/17/2015	1d	2/17/2015	RS27,592.85
157	Removal of Formwork of Beam	2/18/2015	1d	2/18/2015	RS2,100.00
158	Helper	2/18/2015	1d	2/18/2015	RS2,100.00
159	Removal of Formwork of Slab	2/26/2015	1d	2/26/2015	RS2,100.00
160	Helper	2/26/2015	1d	2/26/2015	RS2,100.00
161	Finishes	2/20/2015	8w 4d	4/21/2015	RS2,328,025.42

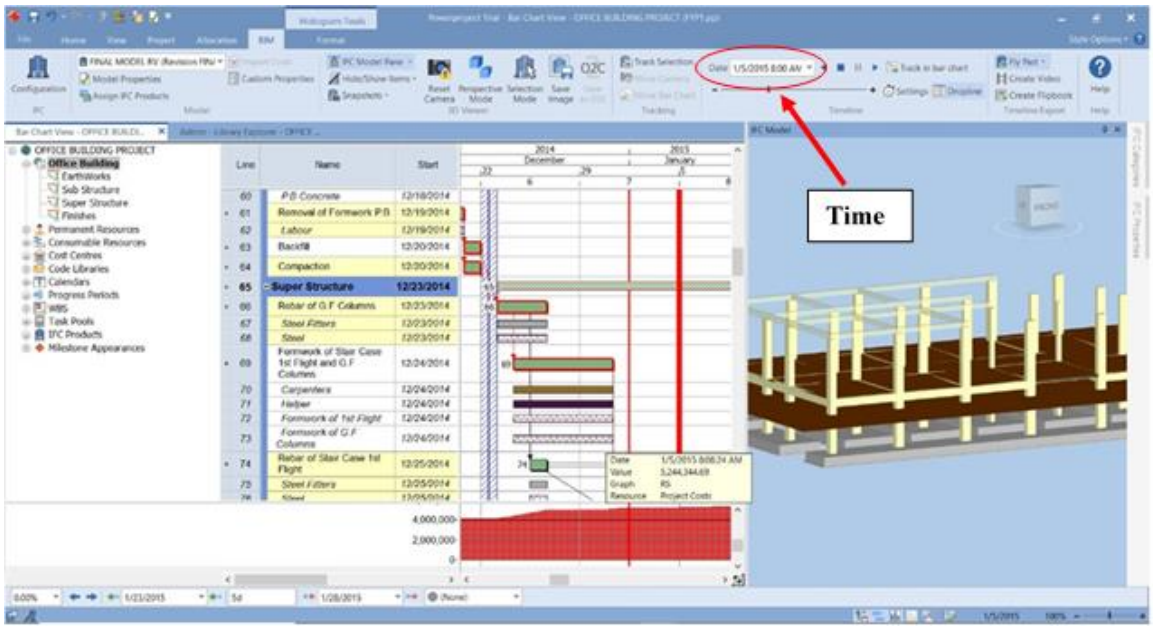

163 Mason 2/20/2015 1d 2/20/2015 RS4,500.00
164 Mason 2/20/2015 1d 2/20/2015 RS9,000.00
165 DPC 2/20/2015 1d 2/20/2015 RS197,721.22
166 Block Masonary 2/21/2015 1w 3d 3/3/2015 RS531,224.00
167 Mason 2/21/2015 1w 3d 3/3/2015 RS94,500.00
168 Helper 2/21/2015 1w 3d 3/3/2015 RS44,100.00
169 Bricks 2/21/2015 1w 3d 3/3/2015 RS392,624.00
170 Plaster 2/28/2015 3w 2d 3/23/2015 RS855,468.00
171 Mason 2/28/2015 3w 2d 3/23/2015 RS300,000.00
172 Helper 2/28/2015 3w 2d 3/23/2015 RS140,000.00
173 Plaster 2/28/2015 3w 2d 3/23/2015 RS215,468.00
174 Doors 3/24/2015 1d 3/24/2015 RS98,715.00
175 Carpenters 3/24/2015 1d 3/24/2015 RS4,200.00
176 Helper 3/24/2015 1d 3/24/2015 RS4,200.00
177 Aluminium Fitter 3/24/2015 1d 3/24/2015 RS4,200.00
178 Wooden Doors 3/24/2015 1d 3/24/2015 RS13,545.00
179 Aluminium Doors 3/24/2015 1d 3/24/2015 RS72,570.00
180 Windows and Ventilator 3/24/2015 3d 3/26/2015 RS193,111.20
181 Helper 3/24/2015 3d 3/26/2015 RS10,500.00
182 Aluminium Fitter 3/24/2015 3d 3/26/2015 RS21,000.00
183 Aluminiun Windows and ventilator 3/24/2015 3d 3/26/2015 RS161,611.20
184 Paint 3/26/2015 3w 5d 4/21/2015 RS638,286.00
185 Helper 3/26/2015 3w 5d 4/21/2015 RS80,500.00
186 Painter 3/26/2015 3w 5d 4/21/2015 RS172,500.00
187 Putty 3/26/2015 3w 5d 4/21/2015 RS224,598.00
188 Primer 3/26/2015 3w 5d 4/21/2015 RS69,388.00
189 Paint 3/26/2015 3w 5d 4/21/2015 RS91,300.00
1.0
0.5
0.0
Calendar Exceptions
Holiday
Overtime
Weekend Working
Link Categories
Normal (C)
Normal
Symbols
Free float
Total float
Critical
Milestone Appearances
Start Milestone

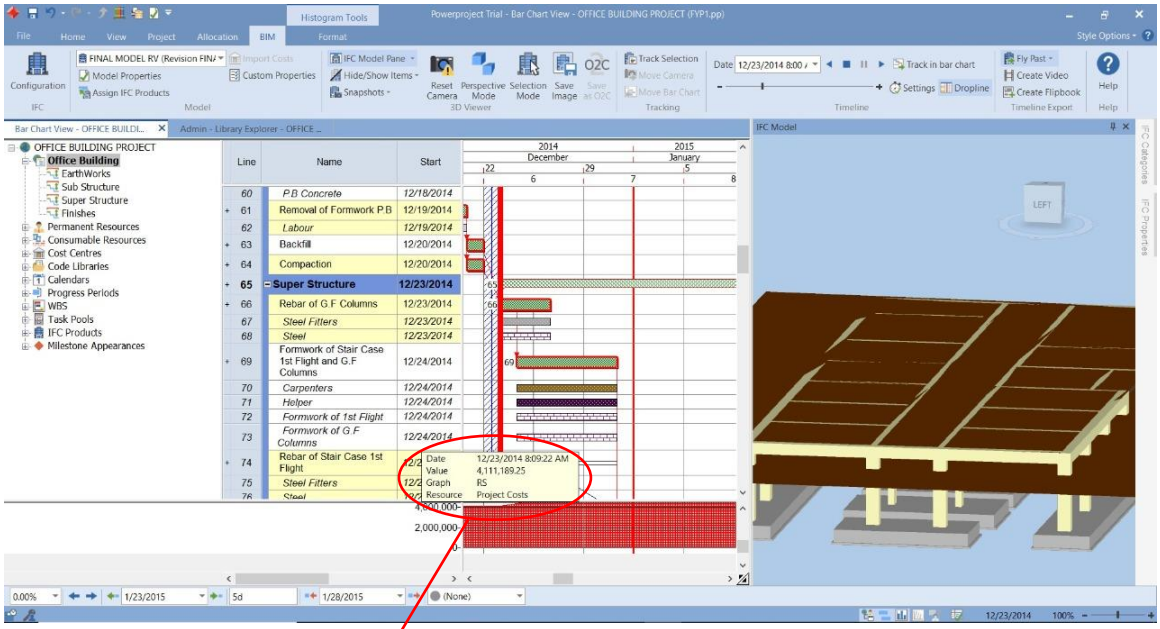
TABULAR AND MODEL VIEW:





INTEGRATED MODEL





COST

CONCLUSIONS AND RECOMMENDATION

In 4D and 5D BIM planning we can integrate 3D model of a project with construction schedule as well as cost in a single application to create a powerful 4D and 5D BIM environment which reflects how build sequence actually work and helps in easy communication between project teams. It is next step in project planning you can play project timeline from initiation to completion with 4D and 5D visualization, during the sequence of construction animation, we can see its time as well as cost from the cash flow graph.

It is apparent that 4D and 5D BIM are revolutionizing the construction industry. The integration of information rich 3D BIM models with added dimensions of scheduling (4D) and cost estimation (5D) ensure better management. However, there are perceived barriers to 5D-BIM implementation within the construction industry: culture resistance, companies having lack of protocols for coding objects within building information model, and lack of qualified staff to adopt this technology.

ACKNOWLEDGEMENT

All Praise to Almighty Allah, who gave us the vigor and strength to complete our project with success. All acknowledgements are to Department of Civil Engineering, Sir Syed University of engineering and Technology, Karachi, for the Support it provided and to those who guided us for the completion of this project.

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