

Executive Summary

The following technical report is written about Memorial Vista, an office building for an undisclosed aviation tenant in northern Virginia. This report analyzes the detailed project schedule, structural and MEP estimates, site layout plans for various phases, a general conditions estimate, constructability challenges, and the uses of building information modeling (BIM) on the project.

The detailed project schedule breaks down the Memorial Vista Project into the sequence of work being done by each trade to easily show the flow of work on the project. The project start date was set to be April of 2011, and is scheduled to finish in January of 2014. This translates to total project duration of approximately 26 months or 540 working days. It is important to remember, like stated in Technical Assignment I, the building is split up into a North and South Wing to allow for an easier flow of work up the building. The schedule also has very few interior fit-out activities included within it. This is because the building is a core and shell structure being performed by James G. Davis Construction (Davis). The interior fit-out will be bid out after the completion of the base building.

A detailed structural systems estimate was calculated from modules within the P2 level, the first level, and the second level of the structure and interpolated throughout the building to come up with a detailed structural estimate. Since Memorial Vista is a structure made primarily of concrete, the estimate is made up of cast in place concrete, the formwork included, reinforcing, and the labor involved. The total detailed estimate for the building came out to be \$16.4 Million, which is 3.20% off of the actual cost of the building, which is \$16.9 Million. This difference in price could be from lack of detail in the estimate, the use of R.S. Means instead of actual cost data for the region, and the fact that the estimate performed does not include the post tensioning that takes place above the Lobby Space or Multipurpose Space.

This report also includes the four individual phases of the site layout throughout the project. The first phase plan shows the layout of the site during the demolition phase, where the structures that originally accompanied the site are shown to be removed. The next site layout plan showed the excavation of the North and South Wing. The third plan shows both the initial phases of the foundation of the structure and also the excavation of the rest of the site. This full excavation of the site was being completed based on the owners request to ensure there was no contaminated soil on the site. The final site layout plan shows the building during the erection of the superstructure. This includes both the concrete structure, and the façade of the building.

The general conditions estimate for Memorial Vista came out to be \$2.6 Million, which translates to around \$101,000 per month. For this project, Davis was brought in when the design phase was 90% completed. This means the GMP had not been fully negotiated, so Davis had a fairly low general conditions estimate, where a majority of the line items that would normally show up as a line item are actually charged to the job. The break down for the general

conditions estimate performed is that 73% of the cost goes towards personnel costs, whereas the remaining 27% goes to miscellaneous costs. These miscellaneous costs include things such as temporary power, field and office equipment, signage, and various other items.

The main constructability issues the Memorial Vista faced in the phases that it has completed so far are the lack of knowledge of the contents below the earth at the project site and the unknown time frames for certain long lead items. One of the first constructability issues the team faced was the fact that the utilities below grade were extremely cluttered, unmarked, and even in some instances – mismarked. This led to a longer utility relocation process than anticipated, and caused early scheduling problems that would need to be fixed quickly and efficiently. One of the second constructability issues that arose was in the excavation phase. In the initial phase of the project, only twenty-four bore holes had been completed for the geotechnical report. If more were done, the team would have found suitable soil for their foundation and the loads created by the buildings loads. If the foundation had been studied more, it would have been noted that the piles would have been redundant and could have been value engineered out of the project. Since the team found this information out in the excavation process, the piles were already ordered and set to be delivered for use. The third issue was the fact that the bus duct that was used to run a current from the switchboard to the panel board had a longer than anticipated delivery date. This then resulted in the delayed start of equipment and in turn pushed the schedule back.

Finally, the team on Memorial Vista completed a model for the project in order to aid in the 3-D coordination and clash detection, and also to aid in the phase planning on the project. The architectural, mechanical, electrical, plumbing, fire protection and structural systems were looked at when running the clash detections to find potential problems in the initial design and construction phases. Although using 3-D coordination provided a great deal of value to the Memorial Vista project team, there are many more BIM options that are outlined in the report that could have provided even more value to the project.