



Executive Summary

The building that was used for this senior thesis project is the Kennedy Krieger Institute Outpatient Medical Center. The Outpatient Medical Center is a developmental and disabilities center for children and adolescences. It is located in downtown Baltimore next to the Existing Kennedy Krieger Institute and the John Hopkins Medical University. This final report includes alternatives to the existing building structure and systems to try and find improved ways of constructing the building.

The first analysis looks at the structural system. The current structural system is cast in place concrete. The concrete created issues with time because the subcontractors under estimated their schedule. The proposed system was using a structural steel design which created a much shorter schedule and got the building out of the ground 3 months earlier than the original system. The cost of using steel was found to be several hundred thousand dollars cheaper and therefore was found to be a better system when it comes to the cost and schedule of the project.

The second analysis looked at the mechanical system. The original mechanical system included 3 air handling units that required 100% exhaust air. This became of some concern due to the large amount of lost energy through the exhausted air. The proposed solution was to install a heat recovery system into each air handling unit. The best choice for the heat recovery system was an enthalpy wheel. However, the enthalpy wheels turned out to be too expensive even though they saved money on the energy costs. Unfortunately cost savings were outweighed by the cost of the equipment.

The third analysis looked at another critical issue. The critical issue that was researched for this analysis was implementing 3D design coordination and utilizing it for mechanical, electrical, and plumbing clash detection. The overall results from a survey on the topic showed that 3D design is a good system to utilize on projects, though smaller companies still do not have the resources to get involved with it. However, the companies feel that once the demand for 3D design coordination increases more companies will start purchasing and utilizing it.