



Executive Summary

This document was created to determine if moving the column placements within the building plan would make it more suitable by using a different floor system. The an analysis was started by taking the current column layout and altering it by keeping the position of some columns, moving the position of other, and adding a few where necessary. This was trying to accomplish the creation of typical bays that would make design much easier for a new floor system. With the columns in their current locations, the only viable floor system to use is a flat plate slab. By moving the columns to locations which create more of a grid layout, it becomes possible to run members between the columns and opens up other options for possible floor systems. Considering the architecture involved with the building, the use of high-performance glass and a shallow floor system gives the building a sense of seamlessness. To make sure the architecture was kept as a main focus, the use of a shallow replacement system was designed. Several different floor system alternatives were considered and a pre-cast concrete hollowcore plank system was chosen to be the best solution. The members were designed to rest upon steel beams which would then transfer the loads into the columns. As part of this re-design, the columns were re-located to make them more able to be connected by members. The pre-cast planks were then designed based on the loads outlined by the New York City Building Code. Once this was done, the columns were then re-designed considering the new loads. Comparing the two systems by serviceability, installation time, constructability, and other detail work shows that the pre-cast concrete plank floor system is a suitable if not preferable alternative. The use of a concrete plank system will give a more basic column layout which simplifies design and creates a grid for quick recognition of column locations. Using pre-cast planks eliminates the need for formwork and since they are created off-site, the quality of the members is very high. With all issues related to time of construction, the pre-cast system is much faster and this will also help with getting the other components of construction done faster, thus opening the building sooner leading to earlier occupancy which will help the owner begin making money much sooner on their investment. When all the conditions outlined in this document are taken into consideration, the new floor system is something which should seriously be considered as an option. Placing the columns in a more basic layout will open up several options for alternative floor systems and if this was given consideration, it would show that these possibilities could have proved to be better solutions.
