

EXECUTIVE SUMMARY

The HBBCH is a convention center as well as a hotel in downtown Baltimore. It consists of two towers of hotel rooms as well as a large podium that includes a pool/fitness area, grand ballroom, and parking garage.

The existing structural systems consist of normal weight two-way flat plate concrete slab with drop panels on six floors, a foundation system that consists of caissons and spread footings, and a lateral system that consists of rigid moment frames that are inherent in monolithic concrete-framed construction as well as shear walls placed around the elevator shafts and stairwells.

Although the structural systems are designed to be as efficient as possible different systems were looked at in three technical reports, and it was found that the only gravity system that could perform as well as the current is a post-tensioning slab system. This will hopefully allow for larger floor-to-floor heights, lower building weight, and larger spans between columns. Also the steel framing system underneath the pool/fitness area could be changed from steel braced frames to steel staggered trusses, which will allow for larger spans, and hopefully a decrease in overall building weight. Due to the chance of a significant change in building weight there will be an impact on the foundation system as well.

Of course when modifying the structural system of a building, the construction process and costs will be affected directly. In order to fully understand the impact of the modifications of the structural systems the schedule and construction costs of the building will be taken into account.

Finally in order to demonstrate the improved environment for the tenants of the hotel and groups that use the ballroom from the redesigned structural systems, sound and vibration control studies will be conducted. In regards to the sound study various wall/partition, and floor assemblies will be analyzed and assigned STC and NR ratings. With the aid of extensive research, a report will be made to show how the existing two-way flat plate floor system and the proposed post-tensioning slab system compare in sound transmission and vibration control.