Hiro McNulty – Structural Option
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Hyatt Regency – Hotel and Conference Center
Pittsburgh International Airport, PA
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Technical Assignment 2

EXECUTIVE SUMMARY

This report is a comparison study of the existing floor system of the Hyatt Regency to four possible alternatives. The alternatives being considered are: one-way slab with concrete joists, two-way flat slab with drop panels, non-composite steel framing, and open-web steel joist framing. A preliminary design of each system is included along with corresponding layout sketches. Each system's advantages and disadvantages are discussed to compare which may be the best alternative and to contrast to the existing design.

The first alternative, 1-way concrete slab with joists, resulted in a 15" floor, but also had the advantage of being a more typical construction technique for contractors.

The second alternative, a 2-way concrete flat slab with drop panels, resulted in a slab thickness of only 9", but near columns, the required drop panels increased the thickness to 17.5".

The third alternative, non-composite steel framing accommodated faster construction along with a lighter building; however, the floor thickness increased to 14.3" at beams and 18" at girders as well as increasing the cost of fire-protection.

The fourth alternative, open-web steel joists, resulted in decreased building weight and faster construction, but had a very deep, 22.5" floor thickness. The joists are also very difficult to fire-proof.

After comparing the various systems, the open-web steel joists have been removed from further consideration. The advantages you gain from using the joists are similar to those that you gain with the non-composite steel beams; however, the system has the greatest disadvantages of all the systems: 22.5" floor thickness and very difficult fire-proofing. These factors would greatly increase cost and height of the building. The other systems can be further investigated. Although the filigree system that was used in construction may be the most suitable for the conditions, the other systems could be adapted for use in the building with further analysis.