

Executive Summary

The purpose of Technical Assignment #2 is to investigate alternative structural floor systems for the existing hollow core plank system used in the Pearl Condominiums. After the investigation of these systems, I will do a comparative analysis to see which of these solutions are viable based on numerous economic, construction and structural criteria.

Existing System:

The existing floor system is comprised of a 10" Precast Concrete Plank with a ¾" concrete thick topping. These planks are supported by 8" metal stud bearing walls.

Alternative Systems:

Four alternative systems were investigated as alternative for Pearl Condominiums:

1. Non-Composite Steel Framing
2. Composite Steel Framing
3. Two Way Slab with Drop Panels
4. Precast Beam with Hollow Core Planks



Conclusion:

After analyzing the four alternative systems it has been determined that the existing floor system was the correct choice for Pearl Condominiums. The precast floor planks work well for use in long spans and the metal stud bearing wall type is easy to construct and is also used to resist lateral forces.

During the analysis, the non-composite and the two way slab with the drop panel were found not to work as well in this situation as the other two possible alternative systems. This is the result from the high total depths and the time needed to construct each floor. The precast beams and hollow core planks work well as long as there is no restriction on overall depth. Also the precast concrete planks can span a greater length while having a shorter depth than a steel beam with a concrete slab. Overall the best system out of the alternative possibilities was the composite steel framing system. The formwork and shoring is minimal because of the metal floor deck. Also the ability for an open floor plan possibility is greater because of the limited reliance on load bearing walls. While these two alternatives performed well enough to be researched further, I feel that the current hollow core planks with metal stud bearing walls as the floor system of the building is the best solution for the structure.