

## Executive Summary

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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, a comparative analysis will be done 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. Flex-Frame
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 precast beams\ hollow core planks were found not to work as well in this situation as the other two alternative systems. This is the result from the higher total depths of the floors and the higher overall building weight for the foundation to support. From the four alternatives, the best system from my analysis was the Flex Frame system.

This system is similar to the original system, but with using the Flex Frame system, the floor plan is more flexible resulting from the elimination of the need for interior load bearing walls. With this system, the floor depths will be same depth as the precast concrete planks, similar to the original system. Compared to the other two steel alternatives, the amount of steel required for the flex frame is substantially less. With respect to the fourth option, the weight of the overall building will be less. Overall the Flex Frame system is an economic and efficient alternative to load bearing walls and precast planks. The Flex Frame system will be researched further for the use in the redesign of the building.