

## **Executive Summary**

The following report contains a preliminary analysis of the existing floor system and several alternatives. Northside Piers, a 29-story condominium tower located in Brooklyn, New York, is currently being built with a concrete structure. It consists of two-way flat plate slabs, shear walls around the central core, and a pile foundation. The gravity loads for this analysis, determined by the New York City Code, were found to be a 40 psf live load and a 30 psf superimposed dead load. The existing floor system is designed to have an exposed finish over the bedroom and living rooms. It will be held up by columns located sporadically throughout the plan.

Initial considerations of depth, constructability, and serviceability led to the choice of four possible alternative floor systems: flat slab with drop panels, pan joist floor system, post-tensioned slab, and composite beams with metal deck. The analysis for these systems was carried out by looking at two approximate strips in the plan. This is just to get initial ideas about the systems and a more exhaustive analysis should take place at a later stage.

Many factors were considered for each of the possible systems including the estimated cost, weight, depth, constructability, fire proofing, acoustic insulation, vibration, deflection, durability, architectural effects, lateral system effects, and foundation effects. It was determined that all of the concrete structural systems will perform fairly well. The variance between systems is not significant enough to make it obvious which system is the best choice at this point. However, the composite beam system would clearly have the worst performance in terms of serviceability due to its thinner slab and the beams that stick 12" below the ceiling. This protrusion fits awkwardly with the architecture and blocks views out the windows, therefore this system is not a viable solution.