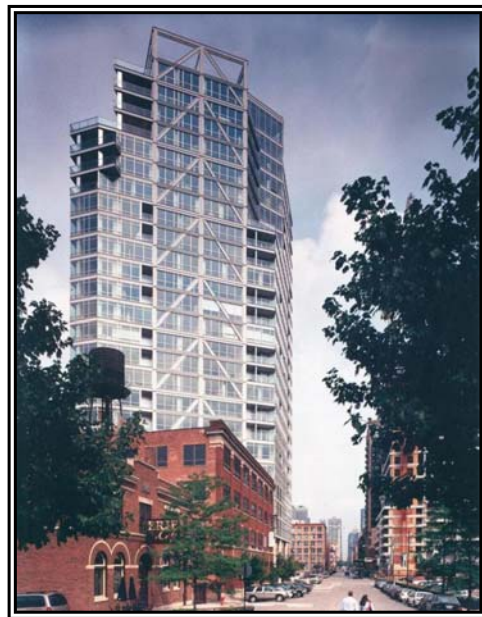


Executive Summary

Erie on the Park is a 25 story condominium complex on W. Erie St. in Chicago, IL. By using steel for the main structural system the architect on this project goes against the normal practice of using concrete as the major structural system for a residential high-rise building. In doing this he allows himself greater flexibility when designing the layout of each of the tenant spaces, and provides a strong architectural statement with the steel chevrons punctuating the building's façade. The entrance to the building is through a grand lobby with a 30' high ceiling. The next three stories are part of a parking garage with many spaces for tenants to park their cars out of the elements. The sixth floor has a fitness center. Floors five through 24 are condominiums that provide a dynamic living space and spectacular views of the Chicago skyline through floor-to-ceiling windows.

This report describes the in depth study of redesigning the structural system of this 25 story condominium complex as three different concrete structures. All three designs incorporated a flat-slab floor system in the attempt to reduce the costs of construction while minimizing the actual depth of the floor system. To further reduce the depth of the floor slab the inclusion of post-tensioning tendons was investigated. The three designs considered for this study were a shear wall lateral force resisting system, a shear wall and moment frame lateral force resisting system that utilizes a 10" reinforced concrete flat-slab as the beams of the frame, and a shear wall and moment frame lateral force resisting system that utilizes an 8" post-tensioned concrete flat-slab as the slab frame. The reason for these various designs was to first see the effect of integrating a moment frame with the shear walls and second to determine the effect of stiffening the floor slab through post-tensioning.



In conjunction with this in depth analysis of the floor and lateral force resisting system, two breadth studies were conducted. The first breadth study delved into the construction management issues of altering the systems from steel to concrete and then the issues between the various concrete systems. In this study the costs and construction schedule of each of the systems were determined and any constructability issues were investigated. The other breadth topic investigated was the implementation of a modification to the plumbing and storm water drainage systems to achieve LEED points. This modification is a rain water collection and storage system that then uses the rain water to flush the toilets in the building in an attempt to reduce the overall usage of potable. The costs and savings of this system were determined as well as any design implications.