

## **EXECUTIVE SUMMARY**

The current gravity system utilized in Three PNC Plaza is a composite system with a typical bay size of 30'-0" x 42'-6". The composite slab is composed of 2" 18-gauge metal floor deck with 3-½" light weight concrete, netting a total thickness of 5-½". The composite deck transfers its load to fill beams that are placed at 10'-0" on center and primarily W21X44 beams with W24X62 girders. The lateral forces from the building are resisted by concrete shear walls located throughout the core of the building along with the steel moment frame surrounding them. This system overall is an excellent design for the building to accomplish what the owners and architects wanted for the building.

The proposed thesis for Three PNC Plaza will be to redesign the current building using concrete as the main material of construction. This will require a new design to the gravity system which may result in altering the current layout of the building. However, if a Two-Way Post Tensioned slab is found as an applicable solution the large spans could still be achieved. This design alternative is being proposed to gain a better understand and more experience in concrete design. The proposed design for Three PNC Plaza has the potential to lower the depth of the existing floor system resulting in a greater floor to floor height. Switching from a lightweight concrete composite system to concrete system will increase the building weight resulting in significant changes to gravity and lateral loads placed on the building. The lateral system for the building will have to be reexamined and changed to deal with the updated loads.

The breadths topics being proposed for this thesis will be a Construction Management breadth, and an Architectural Breadth. From a Construction Management prospective changing the structural system to concrete will have dramatic effect on the cost of the building and the construction schedule. Because of this a new schedule will be proposed along with a new cost estimate for the structural system. The second breadth topic will revolve around the architectural changes required to the building from the new concrete system. The current layout of the building will most likely have to be altered to work with the new concrete structure. These changes will be explored to see the impact they have on the current building layout.