

THESIS PROPOSAL

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STRUCTURAL OPTION
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NORTHBROOK CORPORATE
CENTER

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EXECUTIVE SUMMARY

The Northbrook Corporate Center is a 5 story building located on 1150 Northbrook Drive, Philadelphia, PA. The building provides roughly 104,000 square foot of usable space for office occupants. The total height of the building is 74 feet, with each story being 14 feet high. The building provides a parking garage on its lowest level. The structural system of the building consists of steel columns, steel girders, and steel joists. Steel joist support a 4 inch concrete slab on metal deck; joists are spaced at 3 feet o.c., and span 30 feet between the girders. Steel girders, typically W24x68, are connected to steel columns, typically W12x72, with a moment resisting connection in order to resist the lateral loads.

The design of Northbrook Corporate Center incorporates steel joists and 4 inch concrete slab on metal deck, as explained above. There are several disadvantages involved with this system. High levels of vibration are often observed when steel joists are used in high traffic areas. Due to the properties of the steel joist section, the overall depth of the system is extremely large. Consequently, the design of mechanical systems could be negatively affected. The existing disadvantages of the system, and the lack of clear understanding of this topic creates the need for further study and investigation of the building's floor system. Thus, this thesis proposal suggests that a two-way waffle concrete slab is possibly a more favorable solution to the Northbrook Corporate Center's floor system design. The details of the existing system will be verified and an in-depth study performed. The system's strength, deflection, and vibration levels will be checked. The waffle concrete slab system will be design with the help of CRSI 2002 Concrete Design Handbook, and two systems will be compared.

This thesis proposal includes the description of existing building, buildings structural system, lateral force resisting system, and floor system. This is followed by the problem statement, problem solution, method used to solve the problem, two breath studies, tasks, and finally, the time table.