

Thesis Proposal

Executive Summary

The FDA OC/ORA Office Building is designed as a reinforced concrete structure with a two-way flat slab for the gravity system. This thesis proposes to pursue the development of Progressive Collapse Design and implement that design to the FDA OC/ORA Building. The office building will be redesigned using a steel superstructure.

The gravity system will be redesigned using a typical steel on metal deck flooring system. Beams and girders will be designed using AISC Steel Manual Thirteenth Edition, the gravity loads were determined in the second technical report using ASCE 07-05. The lateral loads were recalculated using the new building weight, and the lateral system will be redesigned. The lateral system will be composed of braced frames at the two elevator cores, and exterior moment resisting frames.

The gravity system will be designed as a typical steel on metal deck flooring system, and after the initial design is completed the critical members will be re-evaluated using the standards for progressive collapse design. Progressive collapse design assumes the loss of a primary structural element and with redistribution of forces, no other structural losses occur. A main contributing factor to the resistance of progressive collapse is the connections. The design of connections that meet the requirements for progressive collapse will be implemented as a part of the master's integration for this thesis.

The impact on the cost and schedule of the overall project will be performed to determine the feasibility of the change in the structural systems. The scheduling changes that would involve the additional construction time for erecting the steel and additional lead time to order the steel. The increased complexity with the connections will also increase the cost of the steel system when compared to the concrete monolithic design.

Using the existing ceiling height, and re-evaluating the existing MEP through a section of the building. The intent is to redesign the MEP passing through a section to account for the added depth of the gravity system without impacting the architecture of the office building.