

## Executive Summary

This technical report is the final establishment for senior thesis and includes information on the Indiana Regional Medical Center. This building will be referred to as IRMC throughout the entirety of this document. The report includes a summary of the building's existing structural system, a concrete redesign of the lateral and gravity systems, a vibration analysis, a lighting breadth, and a construction management breadth.

The IRMC is a full-service health facility that rests in rural western Pennsylvania. It consists of six separate buildings with the main seven story building standing 97 feet high. This main central building is 208 feet by 96 feet and contains a concrete footing and pier foundation. A standard bay in the IRMC is 26 feet by 16 feet and is utilized throughout the building. Composite metal decking is used for the floor system and is placed upon a steel support structure. The rest of the gravity systems contain W14 steel columns that vary in weight throughout the building. The lateral system is comprised of steel moment frames and braced moment frames on the perimeter of the building.

Three alternative floor systems were taken into account when redesigning the gravity system of the building. A two-way flat plate system was chosen due to its low floor-to-floor heights and ease of construction. The new concrete system was designed to meet ACI minimum thickness standards and to resist punching shear. Column sizes and reinforcing were then determined using RAM Structural System and hand calculations. Concrete shear walls were utilized in the redesign of the lateral system. Relative stiffness and drift checks were completed with the assistance of an ETABS model.

A lighting breadth was completed that focused on a redesign of a lobby/waiting room area in the facility. New LED luminaires were selected and exchanged for the current fluorescent luminaires. The tasks of the space were redefined and used in the design.

The construction management breadth included a comparison of the existing structure and the new structure of the building in both cost estimate and scheduling aspects.