

EXECUTIVE SUMMARY

The Roberts Pavilion is a patient care center located in Camden, NJ. It is part of the Cooper University Hospital and serves a large range of patient needs. Standing 10 stories above grade, it is a noticeable landmark when entering Camden. The pavilion was built between two existing hospital buildings and now serves to connect them. During construction, renovations updated the façades on the adjacent buildings to give a sense of uniformity to the complex. Aluminum and glass panels make up the main façade and provide patients with excellent views to the outside. Structurally, the building is framed in steel, with composite deck flooring. Lateral loads are resisted by four ordinary steel concentrically braced frames in each direction of the building.

Purpose and Scope

The following pages contain a detailed report on the Roberts Pavilion. An overview of the existing building is provided as part of this report. The second major portion is composed of a redesign of the building and the studies that were involved in that process. Originally the structure of the building was built out of steel. A choice was made to redesign the building with a reinforced concrete structure. This consisted of designing the gravity system as well as the lateral system.

The redesign was broken into two main portions, gravity and lateral systems. The gravity system was redesigned using a two way slab with drop panels. The lateral system was also adjusted. Braced frames were changed to shear walls and moment frames. To assist with lateral calculations, a computer model was created in ETABS. Both systems were also designed using hand calculations.

In addition to the main structural redesign, breadths in acoustics and construction were done. Acoustics were studied to find the impact of a concrete structure on building acoustics, as well as to study the noise levels in a typical patient room. The construction breadth was split into a cost analysis and a schedule analysis. Cost of the concrete structure was calculated and compared to the steel structure. To analyze the effect of a concrete structure on the project length, a schedule was created and compared to that of the steel structure.

It was determined in the end that a concrete system is feasible. However, it was shown that neither structure held a particular advantage over the other. A concrete structural system was able to be placed in roughly the same space as the steel structure, meaning very minimal changes to the architecture of the building, which was the primary concern. The first breadth found that acoustically, the concrete structure performed better than the steel. The second breadth showed that the cost of the concrete system was found to be less than the steel. This was expected, but the cost was not as low as was previously thought. Finally, project length was increased, as would be expected with a concrete structure. Balancing the advantages with the disadvantages, it was decided that while a feasible alternative, a concrete structure offered no significant advantage over the existing steel structure.