

Executive Summary

George Pearl Hall is the School of Architecture and Planning at the University of New Mexico and is located in Albuquerque, New Mexico. Antoine Predock was the design architect for the building, creating a Spanish-Pueblo style architecture school.

The building is approximately 108,000 square feet and the height is 71.33 feet. The design and construction of the project lasted seven years, from 2000 until 2007. The programmatic addition of the Fine Arts Library, as well as the fluctuating budget led to the lengthy construction time. The architect intended to create a building that would teach students about making architecture. Therefore, the structure and HVAC equipment is exposed throughout the building.

Pearl Hall has received numerous construction merits and design awards. The tectonic structure that is both aesthetic but can also be challenging in terms of structural design.

This report focuses on the structural system in Pearl Hall. Yet, two breadth studies were performed to evaluate the mechanical system and architectural features.

The structural system in Pearl Hall is composed of concrete slab on deck and uses steel beams, girders, and columns as the framing system. The typical interior bay is 30 feet by 32 feet. Special reinforced concrete shear walls function as the lateral force resisting system for Pearl Hall. According to ASCE 7-05, Pearl Hall is located in Seismic Design Category D. The building is designed for seismic forces and drift as the controlling lateral load case.

The design goal is to provide possible cost savings of an alternative lateral force resisting system. The proposed redesigns are: a modified special reinforced shear wall system, special concentric braced frames, and a special moment frame system. The cost was decreased 3.5 times by using the moment frames instead of the existing shear walls.

The architecture breadth study looks at the cost impact of enclosing the breezeway in Pearl Hall by adding architectural glazing. This would increase more functional space for Pearl Hall to use as classrooms and faculty offices. It was determined that the material cost for the redesign would be \$2032.

The mechanical breadth study focused on the performance issue in regards to occupant thermal comfort on the critique bridge on level 2. The results of the study showed evidence using more insulating glazing, VNE 1-30 Glazing that it will provide the most energy cost savings for Pearl Hall. VNE 1-30 glazing provides 9.73% decrease in consumption than the current VRE 3-54 glazing.

The goal of this thesis was to investigate more cost effective lateral force resisting system for Pearl Hall. In addition, it was a personal goal to learn ETABS and investigate design requirement for high seismic regions. In addition, it was to design a usable enclosure for the breezeway and investigate a solution for the heat loss on the critique bridge.

Based on the results discussed, these goals are clearly met.