Executive Summary

Oklahoma University Children's Medical Office Building is an office building located in Oklahoma. It is situated next to an existing hospital and parking garage. The building houses offices, examination rooms and labs for the expanding OU Children's Hospital. It is the largest free standing clinical office in the state and provides much needed medical services to the children of Oklahoma and their families. The building is twelve stories tall for a total of 170 feet and is approximately 320,000 psf.

The structure of the building is reinforced concrete. The building uses a flat slab system supported by columns and exterior beams. Drop panels are used at the column locations to provide extra shear and moment capacity to the slab. The columns are supported on drilled piers that transfer the loads to bedrock underneath the building. The building also uses shear walls and moment frames to resist the lateral forces.

This building provides several unique challenges that a typical office building would not otherwise have. These include a parking garage located on the first floor, a future helicopter pad positioned on the roof, and impact loads on lower levels for vehicle collisions with the building. These design parameters will increase the difficulty of future design assignments as all load cases must be analyzed.

The redesign of the structural system uses composite steel wide flanges and girders with composite decking. The roof is designed as k-series joists spanning between wide flange girders. The lateral system is comprised of concentric braced frames located in the existing shear wall locations. Additional moment frames where incorporated to increase the stiffness of the system. These frames are located along the eastern façade wall. Due to the architectural layout of the windows and floor plan, these frames could not be designed as braced frames.

With buildings becoming more energy efficient, a green roof breadth was conducted to study the vegetation and materials that are involved with a typical assembly. Hardy, succulent plants called sedums where chosen as the vegetation. These plants are typically used on green roofs since they tolerate droughts and can survive in a wide variety of climates. The materials where selected based on their durability, performance, and energy efficiency.

A cost and schedule analysis was also conducted to determine the cost difference and schedule impacts between a cast-in-place reinforced concrete system and a composite steel system. From the analysis, it was concluded that the steel system was more cost effective and less time consuming than the original concrete system.