



Executive Summary

The University of Central Florida's Academic Villages located in Orlando, Florida is a complex of 7 separate dormitories built to accommodate approximately 500 new freshman students. Each building is 4 stories tall and range from approximately 14,000 to 22,000 square feet in area. Each floor typically has between eleven and fifteen 24 ft x 28 ft apartment units.

The existing structure in the Academic Villages is a fully composite steel deck floor system accompanied by a lateral system of masonry shear walls throughout the building.

This report addresses possible changes to the Academic Villages. An investigation was carried out on the existing floor system based on layout flexibility and other criteria. As a result, a new system using a one-way post-tensioned concrete slab was designed, which satisfied the selected criteria. The existing shear walls, which were found to be insufficient with the new system, were redesigned to meet the new loads as well.

The existing mechanical system employed in the academic villages is a Water Source Heat Pump (WSHP) system. It was investigated based on performance costs. As a result, an Energy Reduction Ventilator (ERV) system was proposed to satisfy this criteria. It was found that after 9/10 years, an installed ERV system will save more than the existing system.

The building was checked to make sure that it met IBC 2000 code requirements. It did not and an acoustic subflooring material was recommended to meet code requirements.

Lastly, another acoustic check was done. There was concern that several apartment units located next to mechanical rooms would receive transmission sounds greater than what was allowable. A check proved that the existing system was more than capable to resist additional noise from the mechanical rooms.