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STRUCTURAL OPTION
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UNIVERSITY OF CENTRAL FLORIDA'S ACADEMIC VILLAGES
ORLANDO, FL



THESIS PROPOSAL
BREADTH SUMMARY
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Introduction:

The University of Central Florida's Academic Villages located in Orlando, Florida is a complex of 10 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 current structural system consists of a 2" Epicore metal deck and 4 ½" reinforced concrete slab supported by masonry bearing walls over a 12 foot span. The lateral system is composed of interior and exterior masonry shear walls in both directions.

Breadth Work:

In addition to the structural design which will be performed as the depth part of this thesis proposal, two breadth options were also looked at:

Breadth Investigation 1:

It is important for it to be acoustically insulated since it will be occupied by students. Since metal deck typically is a better sound insulator than concrete, I am concerned that by switching to post-tensioned system, the acoustical properties of the structure will be less effective than that of the existing system. I will be exploring various methods used with post-tensioned to supply buildings with additional sound barriers.

Breadth Investigation 2:

The existing mechanical system consists of a series of ductwork providing natural ventilation throughout each apartment unit in addition to a central system providing conditioned air to public spaces on the first floor. Some of the ductwork protrudes through the floors of the existing structure. This is a concern with prestressed concrete since a hole in the slab would hinder the effectiveness of the strands. I will explore alternative mechanical systems that will work better with the proposed post-tensioned design