

EXECUTIVE SUMMARY

This report evaluates The Duncan Center in Dover, DE as a concrete framed system with two-way flat slabs with drop panels and shear walls, compared to the existing moment frame steel and composite deck system. The system was evaluated based upon structural, acoustics, and construction management analyses.

The concrete structural system consists of typical 12" thick two-way flat slab with drop panels framed with 16"x16" columns, except the sixth floor which is a one-way slab framed with 24"x28" columns. Shear walls with an 8" thickness support the structure laterally, except for on the sixth floor which is supported laterally by a concrete moment frame formed by the slab beams and columns. Foundations were redesigned for the system and augercast piles were change from 16" dia. to 18" dia. with little change to pile cap configurations.

As per the results for the analyses it was found that the proposed concrete structural system performed better than the existing steel structural system for reducing spray-on fireproofing, increasing mechanical ceiling to floor cavity space, increasing the sound transmission class, improving reverberation time, and reducing cost. However, despite all of these benefits, the proposed concrete structural system also increases the construction schedule by six months as compared to the existing steel structural system. Therefore, changing the structural system from steel to concrete is not recommended, as schedule is the Owner's number one concern.



Figure 1: The Duncan Center, Personal Photo: Taken August 16, 2007

