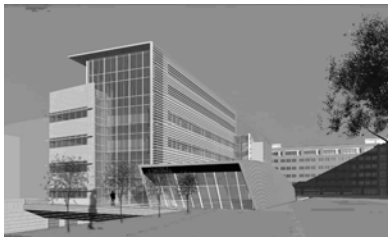
Timothy Mueller
Structural Option
Walter Schneider



FDA CDRH Laboratory

Silver Spring, Maryland

Executive Summary:

The FDA-CDRH Laboratory is currently being built on the Food and Drug Administration's White Oak Consolidation Campus. It is a four story building with a full below grade ground floor and fifth floor penthouse suite, to be used as offices and laboratory space for the FDA. A high bay laboratory is located on the west side of the main building. The CDRH Laboratory has a total square footage of 139,805 and a height of 86' above grade.

The laboratory is currently made of cast-in-place concrete with only two exceptions, sections of the penthouse and high bay laboratory which is a steel construction with moment connections. Due to the monolithic construction of cast-in-place concrete, coupled with the long and low profile of the building, no additional lateral support is needed throughout the laboratory's structural system. The use of concrete for the construction of the building also assists in minimizing the vibrations of the building, which is of concern due to the nature of the building as a laboratory. For my depth work, I propose to minimize the need of two skilled trades, which are currently found on the job site, and only use steel as the main structural system. This will reduce the amount of materials to be used in the foundation system since it no longer needs to support the extremely large masses produced by a concrete structure, as well as reducing the amount of time workers will be on site, due to the speed in steel erection. Due to my redesign of the structural system, two main concerns I will have to look at are; a lateral resistive system that will not interrupt the architectural design of the exterior façade or the interior layout. I will also have to look at how to minimize the effects of vibration on the floor systems of the building either through control systems, or the thickening of the concrete slab.

For my breadth work, I will look at two components that are both engaged with the structural system, the cost and duration of the building and construction, as well as the architectural façade of the building. I will look at how using a steel system affects the overall cost of the building as well as duration of construction. I will then look at how that cost and duration changes due to the addition of vibration controls and additional materials used for slab thickening to find if the economy of a steel structure is outweighed by necessity to have a vibration sensitive structure. The other breadth will look at using a more traditional looking façade that will assist in the continuity of the site, that can be seen in the surrounding FDA office structures. These façades will include tradition masonry construction, an EIFS system, and a precast system. I will then again look at the affects that these different systems have on the overall structure due to changing masses of the curtain wall, and therefore the changes to the cost of the overall structural system that would also incur.