EXECUTIVE SUMMARY

Lockwood Place in Baltimore, Maryland is a thirteen story, one hundred and ninety four foot, mixed-use development building utilized primarily for retail and corporate businesses. The building enclosure is predominately made of steel with a glass curtain wall façade. Directly adjacent to the building sits a covered mall area and a parking garage. The parking garage connects to the second level of Lockwood Place through a corridor and lobby. Gravity framing consists of a composite steel system and lateral framing is comprised of both eccentric braces and moment frames.

The goal of this report is to propose an alternative structural system to the existing conditions. The alternative system will be fully developed through thorough investigation and redesign. Proposed solutions will be carried out through described methods, tasks and tools, and a preliminary schedule.

The existing structural system accomplishes the goal of long spans and open spaces to allow for tenant flexibility. To accommodate high floor to ceiling height and small depth between floors, MEP systems run through the structural beams and girders. Providing holes and necessary reinforcement through almost all beams and girders to allow space for MEP systems could be costly and time consuming. The sizes of the existing steel members have been increased to accommodate vibration created in large spans and to maintain enough capacity with the holes. Future changes in MEP systems are limited due to the necessity of holes in structural members.

A proposed post-tensioned two-way flat slab will achieve the goals of large floor to ceiling heights and a small structural sandwich between floors. The intent of the new floor system is to allow MEP systems to run underneath the floor and have flexibility for future changes. The lateral system will be adjusted to accommodate the new concrete floor system. It will be comprised of shear walls located around elevators/stairwells and concrete moment frames around the edges of the building. To remain consistent with the new concrete system, columns will be redesigned in concrete to resist gravity and lateral loads when applicable.

Two breadth studies will be completed including a comparative cost and schedule study and a lighting investigation. A comparative cost and schedule study will identify differences between the existing conditions structural system with the proposed structural system. With increased floor depth from the new structural system, a mechanical investigation will be conducted to analyze and enlarge existing air duct sizes. Air pressure and fan size will in turn be reduced. Acoustical issues will also improve given the larger ducts and lower air pressure.

BREADTH STUDIES

1. With a complete redesign of the building's structural system, cost and schedule may vary significantly between the old and the new systems. An investigation of cost and schedule for the existing conditions and the proposed solution will be conducted. Results of each study will be compared.

2. By providing a thinner structural floor, mechanical air ducts will have more flexibility in size and location. A mechanical investigation will involve analyzing existing duct sizes, air pressures and fan sizes. Larger duct sizes will be designed with lower air pressures and smaller fan sizes. The reduction of air pressure through the ducts will provide improved acoustical conditions.