

Revised Executive Summary

40 Gold Street is an impressive building that offers retail and residential space in lower Manhattan, which is one of the fastest growing residential sections of New York City. The construction of 40 Gold Street began in March 2009 and will conclude in January 2010. The building replaces an old two story brick building and is nestled tightly between two existing structures, a narrow alley (Eden's Alley), and Gold Street. Rising 175' above grade, the 40 Gold Street building consists of a 14 story structure comprised of 5,900 square feet of retail space and 62,000 Square feet of residential space. The lowest two floors are primarily dedicated to retail space and serve as a podium for the slender 14 story residential tower.

The existing structural system consists of light weight concrete slab on composite metal deck and steel framing. The lateral force resisting system is comprised of 5 braced frames and 4 moment frames. Although the owner preferred a concrete structural system, the steel framing system was selected to maintain a low overall building weight, which was essential in minimizing settlement potential.

40 Gold Street is a high quality residential building; however, several key areas of improvement can be achieved by redesigning the gravity system.

As a result, the floor system will be redesigned as a two way flat plate (waffle slab) with rectangular concrete columns. Not only will this redesign satisfy the client's original request, but it will improve both floor-to-ceiling height and vibration/sound control. By changing the dominant structural material from steel to normal weight concrete, a significant increase in building weight is expected. Therefore, an additional area of focus will require careful design of the gravity system to avoid exceeding the allowable loading of the existing micro pile foundation system. With poor site conditions and closely located existing foundations, underpinning and soil remediation processes will be considered as additional ways to stabilize the foundations and prevent settlement.

Of course, when modifying the structural system of a building, the construction process and costs will be directly affected, and so a cost-schedule analysis will be performed. In order to fully understand the impact of the gravity system redesign, constructability, material availability, construction cost, and labor union issues will be taken into account. After acquiring the schedule and any related construction or cost information regarding the existing building, they will be compared to the new schedule and 4D phasing model created by Microsoft Project and Navis Works (4D model only if time permits).

In addition, in-depth site logistic planning will be completed as well. The site logistic planning is crucial since 40 Gold Street since it is located on a constricted site with limited access points.

Finally, in order to demonstrate the improved residential environment resulting from the redesigned gravity system, sound and vibration control studies will be conducted. In regards to the acoustic control study, various wall and floor assemblies will be analyzed and assigned STC and NR ratings. With the aid of extensive research, a report and several charts will be made to show how the existing and the two way flat plate system compare in sound and vibration control. This will also include an in depth examination of how the architecture will be affected in order to maintain adequate sound and vibration control. The main focus of this study will pertain to the building envelope and isolating residential spaces from adjacent recreational spaces.