

## Executive Summary

Flats on Fifth is a seven story residential building in Pittsburgh, Pennsylvania. The building is located in the Uptown District just off the parkway, only minutes from downtown. 74 apartment units make up the upper five floors with a few on the second floor. Parking is located on the first and second floors with additional common spaces for residents on these floors.

The structure is a podium type structure, utilizing type 1A at the first two levels and type 3A for the remaining floors. The top five floors utilize wood framing. 16" wood joists span the long direction of the building and bear on 6" stud walls located at party walls. The first two levels are framed in steel. Bearing walls end at the third floor, so the second floor framing locates beams directly under all bearing walls. Reinforced masonry shear walls are the main lateral force resisting system. Shear walls are located around stairs and elevators forming three shafts.

The proposed alternative structure changes the wood framing to steel. 14" bar joists are used spanning the long direction bearing on 4"-6" metal stud walls. Additional rows of columns were added to the lower two levels of the building to shorten the spans of more substantially loaded beams. This helped reduce beam sizes. The lateral system remains to be reinforced masonry shear walls. They have been redesigned since the load distribution changed. Floor diaphragms in the existing structure are flexible at residential levels. The proposed structure designs the diaphragms to be rigid. Most walls are 12" thick with varying reinforcement.

An economics breadth has been done to determine the benefit of a few architectural alterations to the building. All parking was assumed to be moved to a sub grade level with all remaining non-dwelling spaces moved to the first floor. The second floor would then be replaced with a floor of only dwelling units, similar to levels three through seven. Comparing the present value of the additional rent for 20 years to the construction cost of the parking level, it is determined that this change would result in a deficit of \$552963.05.

An acoustics breadth was done to ensure that the proposed system would provide adequate sound transmission loss for party walls, exterior walls, and floors. This study was performed using the masses of the existing and proposed assemblies. Results from this study show that the proposed assemblies will provide equal, or better, sound transmission loss.