EXECUTIVE SUMMARY

This thesis evaluates an optimization of building systems performed on Bridgeside Point II. Previous analysis reveals a potential exists to optimize the lateral system, as well as the verticality of the building. Lateral analysis indicates that the first floor behaves similar to a soft story, which results in non-uniform drift. Further research shows that the building tops off approximately 15 feet below the maximum zoning height, meaning extra revenue could be generated with a taller building. The depth study of this paper focuses on the structural issues presented by optimizing the drift and height of the building, while breadth studies focus on optimization of the façade and relocation of the current rooftop penthouse.

The lateral system is retooled by replacing knee braces with chevron braces. This change allows for the beams to be braced at mid-span and facilitates equal member stiffness contribution. An inefficient two-bay frame is condensed into a single bay. The optimized system costs less because of smaller members and a more efficient brace layout. The vertical optimization study shows that adding a floor and moving the penthouse to the ground floor creates approximately 30,000 square feet of new leasable space. The bracing scheme used in the lateral study is also used as part of the vertical optimization study. The extra space and reduced lateral members easily offset the additional upfront costs. If fully occupied, this new building design will pay off faster than the current building design.

The architecture breadth focuses on the façade of the building, as well as, some aspects of the ground floor. The north façade is completely reworked so it can expose the lateral bracing. Other facades underwent similar modifications to expose the bracing on the ground floor. Thus, a sense of load progression from the roof to the foundations is created. What results is a more homogenous façade that accents the structure of the building. The acoustics breadth study focuses on the reduction of noise propagation. By placing the mechanical room on the ground floor, a new space is designed to help minimize the effects of equipment vibration and noise. A thick barrier wall provides ample noise reduction characteristics, and an inertia pad helps rid any structural borne vibrations.

The goals of this thesis are to create an economic and efficient building. Based on the results, these goals are clearly achieved. From a feasibility standpoint, each proposed topic of study positively impacted the structure. It is the recommendation of the author to implement all changes addressed in this thesis.