

Executive Summary

The Macallen building is a 14-story mid-rise residential structure with a maximum height of 169 feet. It consists of three parking levels and eleven residential floors. The parking levels are constructed of cast-in-place concrete and the residential levels utilize steel framing with composite deck. Additionally, the building contains a number of occupiable green roofs, the most prominent being the publically-accessible, 20,000 square foot green terrace on the first residential floor. It is the first residential building in Boston to receive LEED certification, earning a LEED gold rating.

Largely due to the unique architecture and amenities provided by the Macallen Building, only 20 of the building's 140 units are currently available, even though the doors weren't open to occupants until June 2007. However, the height of the building had to be negotiated with building officials due to Macallen's relative height with regard to surrounding buildings. In light of the building's popularity, this proposal includes the addition of another residential level to accommodate more condo units by placing one of the parking levels below grade. This floor addition would require attention to the building's foundation, parking capacity, and gravity supporting elements below the added story. Additionally, the parking garage layout would need to be looked at since cars would now enter the garage on level "P2" instead of "P1".

Furthermore, this proposed depth study includes a seismic analysis of the building in the seismically active zone of San Diego, California. San Diego was chosen based on its seismic activity and because it is foreseeable that the residents of the city would embrace the high-end, environmentally friendly condominium. This depth study also addresses the idea of the Macallen Building as a model for residential, environmentally safe buildings in America. If the structure can withstand the seismic forces in California, it can be built almost anywhere in the continental United States.

The building will be redesigned keeping the same structural type and layout wherever possible because it was determined in Technical Assignment #2 that the design was cost and strength efficient. The AISC Steel Construction Manual, 13th Edition and ACI 318-05 will be used as a basis for design. To supplement hand calculations, an ETABS model will be created to analyze the building in its entirety and compare design values.