

EXECUTIVE SUMMARY

The Revive Apartments is a fictitious name used to maintain confidentiality of this project. It was designed to act as a catalyst to redevelop the neighborhood. This project was issued for construction in June of 2017 and is currently under construction. This six-story high/68-foot-tall mixed use/residential Revive Apartments is located in suburban Delaware. The Revive Apartments is mainly divided into 5 stories of multi-family residential space, 1 story of retail space, and 2 stories of underground parking. Approximately 330 vehicle parking, 10 retail spaces, 165 residential units, and amenities are housed in this 376,000 square feet of low-rise building. The building takes its shape from the property line and streets surrounding it. This shape gives rise to three wings connecting at acute angles. This three-wing design gives birth to a courtyard area at the center.

The structure of this building is complex due to the shape and size of this building. The foundation of this building consists of continuous strip footing for the perimeter walls, slab-on-grade for the lower level parking garage, and concrete spread footings for all the W-shape columns. The parking garages below grade and first two levels above grade are framed using steel beams and columns with composite decking. The top four levels consist of wood floor trusses and shear walls.

In this report, an alternate concrete structural system has been proposed aimed at creating a possibility for multiple apartment purchases and potentially increasing floor-to-ceiling height for apartments. After an initial study of the existing floor plan, a column grid was created with minimal architectural change in mind. Two-way slab with drop panel was selected for the redesigned floor system and concrete shear walls for lateral system. The alternate system was designed and analyzed using code specifications for concrete, design aids, and computer modeling software. Eliminating a podium level affected the proposed architectural plans for garage and retail levels.

The primary codes adopted by the local council with amendments at the time of design are the International Building Code (IBC) 2012, the International Mechanical Code (IMC) 2012, the International Plumbing Code (IPC) 2012, and Ordinance No. 13-034. The ICC A117.1-2009 (Accessible and Useable Building and Facilities), the Delaware State Fire Prevention Regulations 2015, the 2015 Edition of Life Safety (NFPA 101), and Standards for Accessible Design (ADA) 2010 are also used in the design of this building.