

500 Delaware Ave.

1.0 EXECUTIVE SUMMARY

Gateway Plaza is a 15-story office tower located in the Central Business District of downtown Wilmington, Delaware. The \$52 million project began in July 2005 and is projected for completion in December 2006. The 16-story, 210'-6" tower will offer 387,000 square feet of rentable office space



Figure 1-Rendering of the front of Gateway Plaza.
(Photo courtesy of Gensler).

for tenant fit-out. The architect of design is Gensler and the property owner is Buccini

Pollin Group. The ground floor is a public plaza level including a restaurant, post-office, and WSFS branch bank. In the rear of the building there is a 5-story parking garage housing 600 car parking spaces for the building's employees.

This report is an in-depth study of the structural system of Gateway Plaza. The objective of the report is to gain knowledge and experience in post-tensioned concrete design and methods for reducing floor depth. RAM *Concept* software was utilized to determine deflection and stress plans for various loading conditions. The design resulted in a one-way post-tensioned slab that is 8" thick, with 6-strand unbonded tendons spaced approximately 6.25' o.c. The beams supporting this slab are also post-tensioned and range in size from 20"x24" using 12 strands to 36"x24" using 39 strands. The columns and floor system use 6000 psi concrete. Additionally, concrete shearwalls were designed to be 12" thick using 4000 psi concrete and work in conjunction with the concrete frames to resist lateral loads, which were developed using ASCE 7-02.

Two breadth studies were also performed to understand design from the point of view of the other building systems. These studies focus on how concrete design has impacted the mechanical system, specifically the layout of ducts, and the cost and schedule factors in managing the construction.

Through these feasibility studies it has been determined that the post-tensioned concrete redesign of the structure is a good alternative, but not likely to be utilized in the given building market of Wilmington, Delaware.