



Nicole Drabousky
 Structural Option
 Thomas E. Boothby
 Wellington at Hershey's Mill
 West Chester, Pennsylvania
 10/5/2005

Structural Technical Report 1

Executive Summary

Wellington at Hershey's Mill is a retirement community consisting of 197 residential units on the top three floors and a garage level below them. Wellington is five stories with the number of stories above grade alternating around the perimeter of the building. The lower and lobby levels are separate from the residential section and contain the businesses in connection with Wellington. Wellington is 370,000 square feet and located off a prominent road in West Chester, Pennsylvania.

This report consists of an assessment of the structural system and explores the structural design concepts that may have been used in the design of Wellington. The 2000 International Building Code is the basis of the building design but I will be using ASCE 7-02 for my calculations. The design codes are as follows:

<u>Structural Steel</u>	AISC- "Specifications for Structural Steel Buildings"
<u>Reinforced Concrete</u>	ACI 318- "Building Code Requirements For Reinforced Concrete" ACI 301- "Specifications For Structural Concrete"
<u>Masonry</u>	ACI 530- "Building Code Requirements For Masonry Structures" ACI 530.1- "Specifications For Masonry Structures"
<u>Lumber</u>	1996 BOCA National Building Code
<u>Foundations</u>	In accordance with a geotechnical report prepared by Earth Engineering, Inc. dated January 29, 2003

The structural system is a combination of many structural materials. The foundation is slab on grade with strip footings in the exterior, spread footings in the interior, and a cmu foundation wall. The lobby floor and roof and first floor framing is steel joists bearing on girders on steel columns. The second and third floors are 2x6 wood framing with open web wood trusses bearing on the walls. The roof framing is similar to the second and third floor except for slightly sloped wood roof trusses. Wood framed gypsum shear walls and masonry towers located at the elevator shafts and stairwells make up the lateral load resisting system.

The exterior walls of the lower and lobby levels as well as the garage level are cmu block with a conventional red stucco finish for the parts of the wall above grade. The first through third floors' exterior walls are 2x6 wood studs framing with two layers of white stucco finish over wood sheathing.

A spot check was performed on the first floor steel framing and the third floor wood framing. The spot check of a steel girder and steel column resulted in different sizes than the actual design. This could be due to incorrect loading assumptions and calculations. The spot check on the steel joist, wood truss, and wood stud bearing wall all resulted in the same sizes as designed. After a lateral load distribution was performed, the masonry towers were determined to be sufficient for the top levels and the shear walls were not checked. Two towers on the lower levels were found to be inadequate for the lateral loading. This could be due to incorrect calculations or assumptions.