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Structural Option
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Wellington at Hershey's Mill
West Chester, Pennsylvania
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Structural Technical Report 3

Executive Summary

Located in West Chester, Pennsylvania, Wellington at Hershey's Mill is a recently completed 370,000 square foot retirement community with 5 stories and 197 independent living units. Wellington's structure consists of a non-composite steel framing system on the lobby and first floors and a wood floor joist, wood framed system on the top three residential levels.

Technical Report 3 is an analysis and confirmation design study of the current lateral system for Wellington. Masonry towers located at the elevator shafts and stairwells combined with wood framed gypsum shear walls make up the lateral system. The shear walls are only located on the top three levels, therefore the first floor and lobby only use the masonry towers to resist shear.

The calculations for this report were performed by hand and using a spreadsheet.

The following is a summary of the results:

- The seismic forces will control the design of the lateral system
- Because the seismic forces are larger than the wind forces, $1.2D + 1.0E + 0.5L + 0.2S$ is the controlling load combination
- The lateral distribution performed used two procedures:
 - Distribution by rigidity for the lobby and first floor because of the rigid diaphragm
 - Distribution by tributary area for the top floors because of the flexible diaphragm
- Spot checks of the masonry towers showed two towers were not adequate to resist the shear force on the first level. This may be due to incorrect assumptions or calculations. A spot check of a column proved it to be sufficient.
- The shear walls were not checked because the masonry towers sufficiently resisted the shear force on the top levels.
- Drift is not a problem for Wellington.
- Overturning moment was more than adequately resisted by the building weight.