- Robert Whitaker
- Structural ~ Parfitt
- Parkview at Bloomfield Station
- Bloomfield, NJ
- 11-21-05

Structural Technical Report #3

By Robert Whitaker

Executive summary

This report covers a more extensive check of the main lateral force resisting components for Parkview at Bloomfield Station, a six story residential apartment in Bloomfield, New Jersey. Lateral load calculations, including seismic and wind from three directions, are used to compute the loads for the shear walls in the building. The two braced frames at the drive aisles are also analyzed to check their capacity. Finally, a building drift limit is established and compared to code values.

Structural Overview

The structural system for Parkview at Bloomfield Station is a light gage roof composed of trusses spaced 2' on center (oc) spanning front to back, panelized bearing light gage walls 4" and 6" wide continuously capped with a steel tube for load distribution purposes. These walls not only hold the 16" deep D500 Hambro® floor system but also act as the main lateral force resisting system for the building. Thin cross bracing straps attached to the light gage bearing walls give these walls the lateral capacity required. There are a total of 38 shear walls in the building: 17 in the North-South direction, 17 in the East-West direction, and 4 concrete masonry unit (cmu) stair towers that resist load mainly in the East-West direction. The precast garage is structurally separate, and only the 4" building separation will be considered for story drift in the lateral review.

Calculation Overview

All spot checks performed on structural components in the building were calculated using ETABS, a finite element based analysis program, and hand calculations using the shear wall analysis method and the area method. The lowest level of the building was used to check the shear wall assemblies, and the two braced frames.

All spot checks showed that the members were adequately sized for the calculated loads. The light gage shear wall straps, the structural columns and bracing in the drive aisles, and the cmu stair towers were all determined to be adequately sized for the Load and Resistance Factor Design (LRFD) loadings. It was also determined that seismic design controlled over wind in the lateral analysis. The computer output yielded loadings that made the current sizes inadequate, so a more in depth analysis of these lateral loadings will need to be determined. A check of the input and reasonability of loads will be performed to check accuracy of the computer generated data.