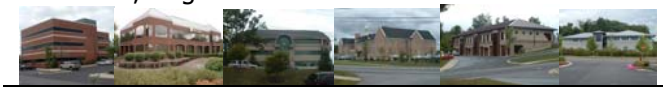

EXECUTIVE SUMMARY

The Signal Hill Professional Center is a four-story suburban office building that provides about 68,000 square feet of office space over an underground level of parking. Though it can be considered a traditional suburban low-rise office building, several unique features come to light:

- A composite steel structure to lessen the floor thickness and expand bay size and span;
- Varying beam elevations and angles in the driveway surface that seek to blend in with its surroundings which changes in elevation as much as 20'-0" from one side of the site to another;
- Lateral resistance from a combination of steel moment frames and a retaining wall in the underground parking area; and
- Larger moment requirements in the driveway surface from large fire engine live loads.

However, before considering the more complex sides of this building's structure, a simple analysis of the current Structural Concepts and Conditions proves to establish the current effectiveness of its structural design.

Key findings related to Structural Design considerations include:

- A design condition analysis shows that loads are mostly driven by the International Building Code of 2003 and its associated standards;
- Calculated loadings show that the 1.2D + 1.6L load combination controls for gravity loadings, that loads are especially large in the driveway area, and that the 1.2D + 1.6W + 0.5L load combination will control for lateral loadings;
- A model of the composite steel structure in RAMSteel reveals that the beams, girders, and columns are more than capable of resisting gravity loads, and that lateral loads may play a larger role;
- A portal frame analysis of a key moment frame to assess column and beam capacity to resist lateral loads in combination with gravity loads determined on the RAMSteel model shows that additional considerations for lateral load distribution needs to be considered for an appropriate lateral analysis; and
- Various detailed hand-calculations to assess beam, girder, and column ability to resist gravity loads at locations where irregularities interrupt the standard steel grid superstructure show that all irregularities are adjusted appropriately.