

EXECUTIVE SUMMARY:

Building Description

The Silver Spring Gateway is a mixed-use high rise development including 14,080 square feet of retail space, 100,215 square feet of parking, 395,439 square feet of residential space, and a 1,000 square foot roof top swimming pool. The building envelope consists of brick cavity walls and aluminum Centria storefront curtain walls. The main structural system consists of two-way flat plate post-tensioned slabs supported by 176 reinforced concrete columns without a typical bay grid. Every column transfers its load into transfer beams or directly into caissons carrying the load to the bedrock below. The lateral loads are resisted by three twelve inches thick reinforced concrete shear walls in the East-West direction and concrete moment frames in the North-South direction. The Silver Spring Gateway also contains a steel truss bridge spanning thirty-six feet over the garage entrance to connect the two portions of the residential space.

Structural Proposal

For the purposes of this thesis, the owner, JBG, hypothetically, acquired the lot in downtown Washington D.C. JBG will petition to alter the C-3-C zone to a C-4 zone to gain twenty to forty more feet in building height thus matching the surrounding buildings. Altogether, this site can accommodate the same architectural layout as the Silver Spring Gateway; however, due to the high profile aspect of the clientele, such as foreign diplomats and national delegates, and proximity to government buildings, the structural design may need altered to resist possible terrorist attacks. First, the locations exuding the most vulnerability to an attack need determined, such as, parking garage, entrance tunnel, exterior façade, etc. Since the current design lends well to several unique scenarios, the structural elements within the existing system will be analyzed per each scenario and redesigned, if necessary, to mitigate the effects of an explosion and to prevent a progressive collapse in case a localized failure occurs.

Breadth Proposal

Site and Landscape Architecture: The site design will need redesigned to prevent the attack scenarios, discussed within the structural study, as much as possible. The new site is larger than the existing site; therefore, more plaza area and landscaping can be accomplished to the accent the building. These designs must keep the tenants safe and comfortable.

Façade Redesign: In addition, the façade may need further attention due to possible historic guidelines and to resisting a street side explosion. The façade change requires focus on blast resistance, architectural and historic concerns, and different moisture control techniques. Any fenestration changes may also affect mechanical loads and day lighting effects.

Methodologies, Tasks, and Schedule

The tasks at the beginning of the semester are well defined; however, the results of these tasks indicate the direction of the rest of this thesis. The following is a list of the tasks that will be performed over the semester culminating the first week of April 2008:

- Research all possible threats
- Research blast loads and properties
- Determine the analysis scenarios
- Create computer model
- Design blast resistant components
- Research Local Architecture
- Redesign façade
- Redesign site and landscaping plan
- Conclude results of analysis
- Develop Presentation