

Building Systems Summary

Demolition

- Abatement - There is abatement requirements for both asbestos and lead. The lead is existent in the current paint on the walls. The paint has not been removed ever since the original construction of the building, and has undergone several renovations and remodeling efforts. There was limited asbestos since the building was complete before asbestos was popular and therefore was only used in a limited capacity during the last major renovation in the 1950's.
- Demolition – The major area of demolition for the project relates to the expansion of the existing chimneys to make room for the pipe chases. Throughout the project there are over 500 chases that need to be located and opened, typically from floor to ceiling. Then they need to be expanded, often both wider and deeper, to accommodate the duct or pipe running vertically through the space. There is also some demolition required for through wall penetrations for the duct and pipe as well. Also, there are an extensive number of through floor penetrations for electrical conduit since it is run in the floor in all of the gallery spaces.

Structural Steel Frame

- There is steel reinforcement, steel angles, needed for the existing granite slab throughout the North and West wings of the third, third mezzanine, and fourth floors.
- In the mechanical chases, often steel C channel is bolted into the masonry walls for support if the chase is expanded from its original size.
- In the courtyard there is structural steel spanning the auditorium area. The connections are mostly bolted, though at the beam splices there are full penetration welds as well.
- The erection of the steel requires a 500 ton mobile crane with an extension to reach over the building into the courtyard. The locations to set up the crane were limited due to the downtown location. G Street between 7th and 8th Streets needed to be closed for two weeks to erect the steel in the courtyard.

Cast in Place Concrete

- The formwork for the concrete for the vertical placements was all built in place from wood, or used the soldier beams and lagging that were in place for the excavation.
- The formwork for the piers and pile caps consisted of some gang forms and wood forms for some of the unique shapes required.

Mechanical System

- The mechanical system is split into two separate parts, one running up from the basement through the second floor, the other starting at the top floor and feeding down to the third floor.
- The mechanical rooms for the lower floors is are located in the basement of the West wing. The mechanical and electrical equipment take up almost the entire basement of the West wing.
- The mechanical rooms for the upper floors are in the North wing and the north half of the West wing.
- The mechanical system is an all air system with vertical distribution using duct through existing chimneys.
- The fire suppression system is an all water system. Due to the historical nature of the building there are some spaces that do not have sprinklers so as not to take away from the historical nature of the space, such as the Lincoln Ballroom.

Building Systems Summary Continued

Electrical System

- The electrical system feeds the building with two 13.8 KVA lines coming into the basement at two separate points.
- The building, besides having two separate feeds, has an UPS system with a diesel generator to maintain power.

Masonry

- The building is an existing load bearing masonry building. Near the foundation the walls are several feet thick.
- The majority of the building is brick; however there are granite and marble columns, and the façade is made up of sandstone, granite, and marble.
- Where there has been demolition the building is, as much as possible, to be built back with brick and block. The use of similar materials lowers the risk of structural issues related to uneven expansion and contraction.
- A unique note for the masonry is when new brick is put into place; the brick used must be uniquely different from the existing brick. The specifications require the unique brick to ensure that in the future it is easier to identify which was original and which was installed in the renovation for historical purposes. The contractor therefore used both blonde and concrete bricks for the new construction.
- Scaffolding was required in the interior of the building when doing work on the chases. The scaffolding was used for two reasons:
 - ◆ To support the existing structure when demolition undermined supports for the floor above
 - ◆ When doing work at some of the higher elevations. Some of the grand spaces have ceiling heights approximately 40 feet above the existing floor.

Support of Excavation

- The support system for the excavation of the courtyard consists of soldier beams and lagging.
- The support system remained in place and served as the rear form for the cast in place concrete walls in the courtyard.
- Since the excavation had portions of existing building along the west, north, and east faces dewatering was only an issue due to rain. When necessary a pump was brought in to dewater the courtyard.