

Project Description

The Virginia Capitol Building is a 216 year old structure originally designed by Thomas Jefferson. The original structure was much smaller than the current Capitol due to an extensive overhaul from 1904-06. In this time period, the east and west wings were added to the primary building. These wings now hold the Chamber of the Senate and the House of the Delegates. Construction of the recent Extension and Renovation began in July 2004 and will finish by January 2007. The construction needs to be finished by January 2007 due to the 400th Anniversary of the Jamestown Settlement being held in Richmond, in which the Queen of England is planning to attend. The goal of this project is to be a '100 year renovation.' DGS does not want to perform any more renovations to the structure in the next 100 years. Other important facts include:

Primary Project Team:

- Owner: Department of General Services (DGS)
- CM at Risk: Gilbane / Christman Association
- Architects: Hillier
- Mech./Elec. Engineer: Joseph Loring Associates
- Structural Engineer: Robert Silman Associates
- Civil Engineer: Draper Aden Associates

Project Costs:

- Construction Costs: \$64,800,000
- Design Cost: \$1,000,000
- Total Costs: \$65,800,000

Project Schedule:

- Design Start: October 1, 2003
- Construction Start: July 12, 2004
- Substantial Completion: December 11, 2006

Delivery System:

- This project is a CM at Risk delivery system. Gilbane / Christman will hold a GMP contract with the Owner. This is one of the first CM at Risk jobs that the Commonwealth of Virginia is attempting. They switched from the traditional Lump Sum/Low Bid GC delivery system to CM at Risk, which they hope to have better success.

One of the interesting relationships in this organization is the association between Gilbane Building Company and Christman. Gilbane is a large construction management firm which joined forces with Christman. Christman is a firm that specializes in historical renovations. This relationship is not considered a joint venture though. It is considered an association between the two.

Architecture:

- Existing Capitol:
 - Jeffersonian Style Architecture
 - Five Story Structure
 - Façade is a three-ply structure
- Extension:
 - Two level subterranean structure
 - Exhibit space for artwork and historical items
 - High end finishes

Building Systems Summary:

- Demolition
 - A large majority of this project is demolition due to the fact that it is a renovation project.
 - Types of materials:
 - Existing MEP equipment and materials.
 - Exterior stucco system.
 - Walls, flooring, and ceilings.
 - Walls and ceiling is a plaster material.
 - Majority of flooring is tile.
 - Brick Pavers
 - A few select doors and windows.
 - The rest are going to be restored and placed back in.
 - Asbestos was located on the ground level in the vault. GCA secured the area to remove the tile flooring.
 - There is continuing asbestos investigation occurring in the building.
- Structural Steel Frame
 - There is a small amount of structural steel frame used to support the existing roof. This consists of mainly diagonal bracing.
 - The only other structural steel will be used in the extension. This will also be used as a roof support.
- Cast in Place Concrete
 - The extension will be made from cast-in-place concrete.
 - Both horizontal and vertical formwork will be used.
 - The method of formwork will be up to the subcontractor. The bid has not been awarded yet.
 - The method that GCA is expecting is the standard wood formwork.
 - The concrete will be placed by a concrete pump for the majority of the work. Where possible, it will be placed directly from the truck.

- Mechanical System
 - Both structures will use a combined forced air and hot/cold water supply system.
 - Forced air system is using rectangular duct. Supplied by roof mechanical units.
 - Hot/Cold Water supply will use radiator system on the floors. Supplied by piping that comes from the east MEP tunnels.
 - Fire Suppression system is an overhead dry sprinkler system.
 - Existing Capitol Mech. Room Locations
 - There are two main rooms located on the roof.
 - Mechanical rooms are located on the ground floor – South End
 - Extension Mechanical Room Locations
 - They are located on the Northeast end of the extension. This is where the MEP tunnel comes into the Capitol Structure.

- Electrical System
 - Service: 12000 kV
 - 277/480V, 3 Phase System

- Masonry
 - Existing Capitol
 - The Capitol has an existing brick foundation system.
 - The Capitol has exterior brick walls that are covered by the stucco system.
 - Masonry scope of work primarily consists of touchpointing of brick.
 - They will use a scaffolding system to touchpoint the bricks.
 - Scaffolding is the basic metal frame with wood plank structure.
 - This will be erected in four different phases. One side of the Capitol at a time.
 - Extension
 - There is not any masonry used in the extension.
 - Extension exterior walls will be made of structural concrete surrounded by waterproofing for moisture protection.

- Curtain Wall
 - Existing Capitol
 - A 3-Layer stucco system will be applied to the Exterior of the Capitol using a scaffolding system.
 - This will be applied using brushes and trowels.
 - This system will keep the architectural feel of the Existing Capitol Exterior as well as act as a moisture barrier.
 - Extension
 - There are no curtain walls used for the Extension other than some of the wall partitions.
 - These walls are made of concrete.

- Support of Excavation
 - Existing Capitol
 - The only excavation around the north, west, and east ends of the Capitol is the trench drain system.
 - This will act as a permanent dewatering system for the Capitol.
 - Extension
 - The extension will use an elaborate soil retention system.
 - The sequence for building is as follows:
 - A 35 foot slurry wall will be placed on the south side of the Existing Capitol, where the existing South Portico Stairs exist.
 - Tie backs will be tied into this slurry wall.
 - Jet Grouting and Compensation Grouting will be integrated into this slurry wall.
 - All of these systems are needed due to the stringent deflection and lateral movement specifications for the Existing Capitol.
 - Soldier Pile and Lagging will be used around the east, west, and south side of the extension.
 - There is no need for dewatering at this time.

Local Conditions:

- The preferred method of construction that particularly shows up in Richmond is concrete work. Concrete is more typical than steel due to the historical nature of the projects. Many owners want concrete instead of steel.

Parking is a problem in Richmond. The downtown area is a congested site with a large number of state or federal government structures. There is also a medical school, The Virginia Commonwealth Medical School, in other government buildings. This means that there are a lot of commuters that travel to downtown Richmond. The Virginia Capitol Police only allow vehicles that are required for construction onto the site. The rest of the vehicles, including the Construction Management firm's vehicles are required to be parked off site. The only place to park these vehicles are in the parking garages that are in downtown. There are two that are close to the Capitol, but they are overcrowded.

Another problem with local conditions is the availability of subcontractors. Richmond is booming with construction projects at this time. There is already a shortage of qualified contractors for large construction projects and in the next six months there are a variety of large projects that will start. This includes a Performing Arts building located two blocks from the Virginia Capitol Building, which Gilbane / Christman was awarded as a CM at Risk. Virginia is also a 'Right to Work' state which means that the state does not require union workers.

The majority of the soil in and around Richmond is made up of clay and sand. This layer of soil is approximately 20 feet deep and called the Pleistocene soils.

The water table fluctuates. On this project it is about 20 feet below grade. They are not sure if dewatering will have to occur or not.

Client Information

- The Owner of this project is the people of Virginia and they are being represented by The Department of General Services. DGS is a very hands when it comes to construction. They oversee all of the Virginia State projects and they are knowledgeable in the construction industry.

There are a variety of reasons for renovating the existing Capitol and building the Extension. The main reason for the renovation is because the existing building has many problems at the present time. The existing Capitol has moisture penetration, locations of asbestos, and it has also flooded some areas at times. DGS wants to fix these problems and in doing so, they are calling for a “100 Year Building.” This means that they want the current renovation to be able to withstand 100 years of time. The other main reason for the extension and renovation is the 400th year anniversary of Jamestown that is coming up in 2007. They are planning on a huge celebration in Richmond, which will be attended by the Queen of England.

Expectations:

- ✓ Cost: Cost should not exceed the projected total cost. They need to keep it below budget due to the fact that the people of Virginia are the ones paying for it.
- ✓ Quality: Quality is a premium. DGS wants this building to last for 100 years. The architect also has many high end finishes and designs in the structure.
- ✓ Schedule: Schedule is important. This project needs to be finished by 2007. There will be major late fees involved if this date is not reached.
- ✓ Safety: Safety is important with the owner and the construction management team on this project as in most construction projects. This project is already in the public eye and an accident will be extremely detrimental to the project.

Examples of these issues are evident in their Design and Construction Meetings that are held every week. Cost and Schedule is a major issue in these meetings. They are the main topics discussed. As for quality and safety, all of the workers on site are required to go through a training sessions. There are two sessions, one for quality and one for safety.

The owner’s main phasing issue deals with the Existing Capitol Building. They want to keep their government workers in the Capitol as long as possible. Therefore, the extension’s construction will start first. The Capitol workers are going to move into the Old State Library, which is adjacent to the Capitol. This building is being renovated right now. This move will occur in the spring of 2005. At this time, renovation will begin inside the Existing Capitol.

MEP Coordination

- The mechanical subcontractor will take the lead in coordination with the other MEP subcontractors. This subcontractor will review the drawings and place his coordination and spacing plan onto a set of coordination drawings. The mechanical contractor will then send these drawings to the plumbing and fire protection subcontractors next. After they have added their systems and communicated concerns back to the mechanical contractor, they will give the drawings to the electrical, telecom, and security contractors.

Throughout the entire project, there will be weekly coordination meetings that occur at Gilbane / Christman's site trailer. Either the foreman or project managers from the MEP trades will come to these meetings to coordinate their plans for the next two weeks. These plans will be placed into a two week look-ahead schedule or description. The concrete or structural subcontractor will also get involved in this process when needed. These contractors will become involved when the MEP trades have to interfere with their work.

- Areas of Greatest MEP Coordination Concern
 - There is a large challenge to fit a lot of the mechanical ducts, electrical conduit, security, and telecom systems into an old building that was never designed to accommodate these systems. The designers had to create new chases and/or utilize existing ones that run through the existing Capitol. This is a huge concern for the CM team and the MEP trade contractors that are bidding the project.

One thing that they are doing is tearing up the entire ground floor corridors and creating small utility tunnels that will run under the floor. This will alleviate some of the space issues that are going to hinder the construction on this project, but they still have to deal with the vertical chases running through the building. As of this time there are no major MEP coordination concerns for the Extension that will be built off the south side of the Capitol.

A coordinated MEP construction plan will be reached by the CM running weekly MEP coordination meetings. The superintendents will require the MEP subcontractors to discuss what they will be doing and come up with a plan that will make construction run smoothly.

Since the majority of construction has not started yet, there have not been any field conflicts that have arisen with the structural and MEP systems. Most of the work that has been performed so far has included demolition of finishes and MEP equipment and site work.