

AE 481W

TECHNICAL ASSIGNMENT 1

Submitted 10/4/2010

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Construction Management

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[The following report presents a technical summary of the Office Renovation Building project. Within this assignment an in depth discussion of the renovation project will be discussed through the exploration of the major building systems, cost analysis, construction schedule, project team organization and existing site conditions.] 1

Executive Summary

The Office Renovation Building is one of the largest civil buildings owned by the General Services Administration. Completed in 1932, the structure houses 1.8 million square feet of office space for a variety of government agencies. Located in a downtown metropolitan area in the northeastern part of the United States, the \$500 million project is scheduled for completion in multiple phases during the next 13 years. While over 3,500 workers continue to occupy the historic building, the project will use a swing space completed in phase 1 of its construction to move employees out of the construction zones. Gilbane Building Company and Grunley Construction have formed a joint venture to act as the project's general contractor for phases 1, 2, and 3.

The seven story Indiana limestone façade and granite base structure will be undergo a major modernization to upgrade all major building systems. Once complete, the building will sport new fire and life-safety systems, enhanced perimeter security, and high-efficiency electrical and HVAC systems. A major focus of the project is to achieve LEED silver certification for the Office Renovation Building. This accreditation will be attained primarily through energy efficient systems and the re-use and recycling of existing materials.

This report's analysis will focus strictly on the second phase of the renovation. During this phase, the structure's entire exterior façade will undergo complete restoration in addition to the abatement and demolition of the corresponding area's interior offices. Also, the construction of an Electrical Equipment Enclosure (EEE) is to be erected within one of the building's interior courtyards.

This technical report will analyze the major building systems, schedule, cost, site plan, and existing conditions of the Office Building Renovation. Following the technical details of the project, a profile of the client will present how the project came into development. Highlights of the client's major expectations and concerns will also be provided. A discussion of the project delivery method and staffing plan executed by Gilbane-Grunley will conclude this assignment.

Following the completion of this technical analysis, several issues regarding the execution of the project have been considered for potential thesis research. A detailed investigation of LEED submittal tracking and execution will be analyzed to help streamline the process for future phases of the project. Also, the delivery of Building Information Modeling (BIM) will be assessed in comparison to The Pennsylvania State University's BIM Execution Guide to research if the modeling process can further benefit the project scope.



Figure 1: Sectioned rendering of Phase 2 work including the building's Electrical Equipment Enclosure

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Project Schedule Summary

The General Services Administration began the conceptual design for the Office Renovation Building in July of 2007. GSA worked with the architect, Group Goetz Architects, and alongside with the project's structural and MEP engineering firms to develop an acceptable design for the structure's renovation design. At the 75% completion of the project's design documents, Gilbane-Grunley Joint Venture submitted a bid for phases 2 and 3 of the project. On August 5, 2009, the General Services Administration awarded GGJV a Guaranteed Maximum Price contract based on the general contractor's 'best-value' bid.

A number a major sequencing events and milestones take place throughout the project's construction. Due to the nature of the renovation project, there is no foundation work listed within the scope. Gilbane-Grunley broke ground by isolating the construction zone from the occupied portions of the building. This was done with the utilization of demising walls often referred to as dust partitions on site. A significant part of the earlier stages of the project schedule summary involve the demolition and abatement of each floor within the Office Renovation Building. Following the near completion of the building's interior abatement work, GGJV will proceed with the erection of the Electrical Equipment Enclosure (EEE) in courtyard 1 in early February 2011. The *Project Schedule Summary* listed in **Appendix A: Project Schedule Summary** lists the activity of the EEE as a single line item; this was done in an effort to make the schedule easy to read at a project overview level. A more detailed schedule regarding the coordination and completion of the EEE will be included in the upcoming Technical Assignment. Furthermore, another major process that takes place throughout the general duration of the project is the cleaning and restoration of the building's exterior façade and windows. Exterior work began in early February 2010 with numerous cleaning mock ups to help coordinate how to most effectively restore the exterior limestone to its original state. Gilbane-Grunley is currently proceeding with the exterior cleaning in addition to the restoration of the building's 5,700 historically declared windows.

With the amount of various tasks taking place within the Office Renovation Building project, Gilbane-Grunley has utilized an efficient production schedule by organizing concurring tasks throughout the building; this can be noted in the structure of the *Project Schedule Summary*. Barring any changes to the contract scope that may significantly alter the project schedule, the Office Renovation Building project is scheduled to achieve substantial completion by early September 2011 along with a completed punchlist and the resolution of any construction issues by November of 2011.

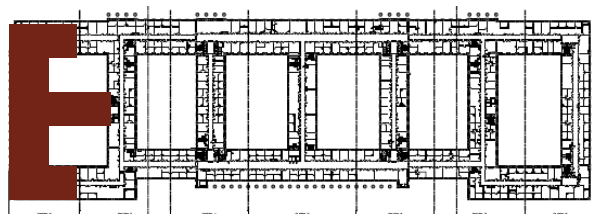


Figure 4: The shaded region represents the main building area specific to Phase 2. The entire building façade restoration is also contracted under Phase 2.

Building Systems Summary

| Work Scope | YES | NO |
|------------------------|-----|----|
| Demolition | X | |
| Structural Steel Frame | X | |
| Cast-In-Place Concrete | X | |
| Precast Concrete | | X |
| Mechanical System | X | |
| Electrical System | X | |
| Masonry | X | |
| Curtain Wall | | X |
| Support of Excavation | | X |

Table 1: Building Systems Summary

Demolition

Considering that the Office Renovation Building project is mostly comprised of renovation work, demolition is the first major step of the structure's modernization. With the building's first major renovation since its original completion, much of the demolition work will be comprised of the abatement of all asbestos containing materials.

Gilbane-Grunley has organized a top-down sequencing schedule for the Phase 2 demolition of interior spaces. Crews will begin on the project's seventh floor proceeding with the removal of any furniture and asbestos free materials. The abatement subcontractor will follow with their scope of work as soon as each floor is cleared accordingly. Because of the size of the phase 2 space and the amount of asbestos containing materials present throughout the structure, abatement crews will be working both day and night shifts. A heavy emphasis has been placed on night abatement to pose minimal impact on any other work that may be put in place. Interior abatement has already begun and will not conclude until October of 2011, a month prior to the project's scheduled completion.

The restoration of all exterior windows also portrays a major process within the demolition of the project. The windows have not been renovated since the building's construction in 1932 and most of which are no longer operable. All 5,700 windows are historically designated and covered in lead paint. At the building's exterior, crews will strip each window and repaint them to match their initial state. Within the interior of the building, Gilbane-Grunley has scheduled to dismantle and reinstall each counter-weight system to make the windows operable as originally designed.

Other work within phase 2 includes the demolition of the courtyard 1 roof and existing chiller plant located in the building's courtyard 1 basement.

Structural Steel Frame

The existing structural system is composed of steel columns, girders, and columns encased in concrete. To the contrast of the typical construction practice of reinforced concrete structures in the area; the Office Renovation Building was completed prior to today's modern day applications of reinforcement and fireproofing.

The Electrical Equipment Enclosure to be built in courtyard 1 is to be erected of structural steel columns and beams and cast in place flat plate slabs.

Cast In Place Concrete

Limited cast in place concrete will be put in place on the Office Renovation building project. The Electrical Equipment Enclosure is the only segment of phase 2 that will require any new construction.

Two additional floors will be erected on top of an existing structure in courtyard 1. Following the placement of the enclosure's structural steel, CIP flat plate slabs will be placed at the two corresponding floor levels. Horizontal slab formwork consisting of standard plywood sheets will be utilized. This floor structure has been chosen because of the electrical equipment designated for the area. Concrete slabs will be poured via pump. Concrete trucks will utilize the closely located material staging area to park their trucks while pumps will be brought in through the building and into the adjacent courtyard.

Mechanical System

The Office Renovation Building project includes a complete upgrade of MEP systems during phase 2 of construction. New open-circuit, induced draft, cross flow cooling towers were in installed above the eighth floor penthouse adjacent to courtyard 5 in phase 1. During phase 2, Gilbane-Grunley Joint Venture (GGJV) is to replace the existing steam utilization with a new hot water heating system. GGJV is to also upgrade the structure's mechanical system with new shell-and-tube heat exchangers in addition to the utilization of gasketed plate heat exchangers. New centrifugal water chillers will be installed in the building's chiller plant located in the courtyard 1 basement. The systems are to perform in compliance with ASHRAE 90.1-1999 minimum energy performance at full and part load conditions. This is to help the build operate with greater efficiency while earning 7 LEED points under EA credit 1: Optimization of Energy Performance; the renovation is scheduled to earn at least 10 points in the Energy and Atmosphere division of LEED version 2.2 for New Construction and Major Renovations.

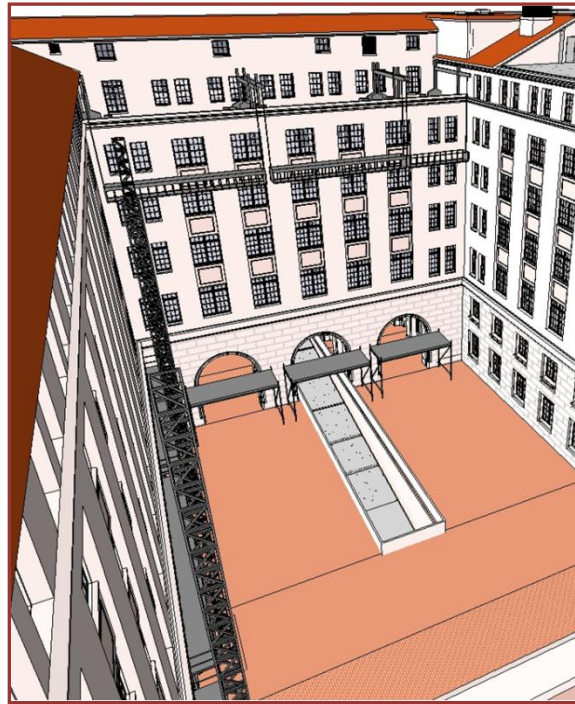


Figure 2: Revit image illustrating the varieties of scaffolding and overhead protection for façade cleaning and window restoration

Electrical System

Most of the electrical work is comprised within the construction of the structure's new Electrical Equipment Enclosure. Provided will be five newly installed electrical switchgears, three emergency generators, appropriate transformers, and three fuel cell day tanks to provide temporary power in the event of a crisis. A key element to the project scope strictly defines that there is to be no interruption of the electric services to facilities occupied by the Government or others unless permitted. This is due to the sensitive nature of government work taking place within the building during construction. Gilbane-Grunley has been sure to take every precautionary measure in regards to the project's electrical work and will support the temporary feeding within the existing building electric service. PEPCO Power is the main provider of electrical energy for the Office Renovation Building.

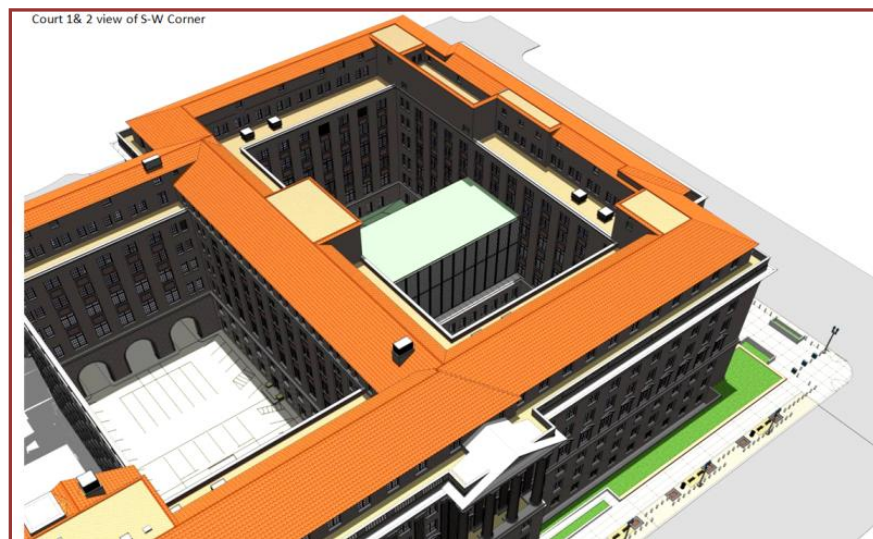


Figure 3: A rendering of the completed Office Renovation Building with the Electrical Equipment Enclosure (EEE) located in the center of courtyard 1. A green roof will be installed throughout the courtyard and on the EEE.

Masonry

No new work will be installed by Gilbane-Grunley during phase 2 of the Office Renovation Building but a complete restoration will take place throughout the entirety of the structure's exterior. The limestone façade will be cleaned and restored to its original state; GGJV has already performed several mock-ups to ensure the cleaning it done to the satisfaction of the owner. GSA has recently called in an expert to analyze the staining to provide direction on how to best clean the Indiana limestone. Hydro-mobile and suspended scaffolding will be used for all masonry and window restoration (Figure 2).

Project Cost Evaluation

The following estimate values are based on the research performed by the Gilbane-Grunley Joint Venture. As per the request of the building owner, some figures have been slightly altered and do not completely portray the actual costs of the project. The costs shown do not represent the actual bid costs for the project.

| Project Overview | | |
|--|--------------------|----------------|
| Square Footage of Ph2 Renovation: | 260,000 SF | |
| Construction Cost: | Actual Cost | Cost/SF |
| Actual (without general requirements): | \$ 96,132,063 | \$ 369.74 |
| Actual (with general requirements): | \$ 98,397,753 | \$ 378.45 |
| Total Project Cost: | | |
| Actual GMP Cost (Allowance Included): | \$ 114,687,300 | \$ 441.10 |

Table 2: Project Overview and Cost Breakdown

| Building System | Actual Cost | Cost/SF | % of Building |
|--|------------------|----------|---------------|
| Demolition and Abatement | \$ 3,637,118.00 | \$ 13.99 | 3.70 |
| Site Utilities | \$ 2,881,000.00 | \$ 11.08 | 2.93 |
| Exterior Stone and Masonry Restoration | \$ 7,653,110.00 | \$ 29.44 | 7.78 |
| Structural Steel and Mis. Metals | \$ 2,338,600.00 | \$ 8.99 | 2.38 |
| Roofing and Waterproofing | \$ 2,068,000.00 | \$ 7.95 | 2.10 |
| Window Restoration | \$ 3,997,113.00 | \$ 15.37 | 4.06 |
| Plumbing and HVAC | \$ 23,670,625.00 | \$ 91.04 | 24.06 |
| Electrical | \$ 18,153,000.00 | \$ 69.82 | 18.45 |

Table 3: Building Systems Cost Estimate (Selective Systems)

With reference to **Table 3: Building Systems Cost Estimate**, please note that significantly large cost contribution within the Plumbing, HVAC, and Electrical systems. This is because the replacement of the structure’s corresponding systems takes place during Phase 2 of construction. In contrast to this phase, future phases of the building’s renovation will have significantly lower mechanical, electrical, and plumbing construction costs.

R.S. Means Costworks® Square Foot Estimate

Due to the nature of this project, it is difficult to accurately apply the estimating methods associated with *R.S. Means Costworks®*. The Office Renovation Building project is broken down into 8 specific phases and has the majority of the building’s MEP systems renovation work contracted under phase 2. The Costworks® reference could not be tailored to create an estimate focused on a renovation project that does not apply to the entire building. Also, phase 2 incorporates the entire restoration of the

construction of the Electrical Equipment Enclosure; the Square Foot Estimating Resource does not list an option for such a structure. Due to the project scope details described, the R.S. Means cost estimate does not accurately reflect the project’s actual GMP contract.

| RS Means Cost Estimate Overview | |
|---------------------------------|---|
| Building Type: | Office |
| Construction Type: | Limestone Panel Concrete Block Back Up/R/Con. Frame |
| Location: | Not Listed |
| Date: | 2010 Quarter 3 |
| Labor Type | Open Shop |
| Basement Included: | Yes |
| Story Height (FT): | 12 |
| Area (SF) | 260,000 |
| Perimeter (LF) | 1,300 |
| Stories Count | 8 |
| Total Building Cost: | \$ 28,849,500.00 |
| Cost per SF: | \$ 110.96 |

Table 4: R.S. Means Cost Estimate Information Overview

Please reference **Appendix B-1: RSMeans Costworks® 2010 Estimate Report** for more detailed breakdown of the estimate.

D4 Square Foot Cost Estimate

D4 Cost Estimating Software was also utilized within this assignment in an attempt to gain full understanding of the project’s estimate value. However, similar to R.S. Means, the program was limited in specifically tailoring the final estimate to match the conditions of the project

| D4 Cost Estimate Overview | |
|---------------------------|----------------------|
| Building Type: | Office |
| Project Type: | Addition/ Renovation |
| Location: | Not Listed |
| Bid Date: | Aug-10 |
| Area (SF) | 260,000 |
| Stories Count | 8 |
| Total Building Cost: | \$ 39,191,435.00 |
| Cost per SF: | \$ 150.74 |

Table 5: D4 Cost Estimate Overview

Please refer to **Appendix B-2: D4 Cost Estimate Report 2010** for a detailed breakdown of values

Final Cost Estimate Analysis and Conclusions

The results of the two additional estimates do not coincide with the actual values applicable to the project's GMP contract. Due to the uniqueness of design fees, general conditions, allowances, and general scope of work it is difficult for either program to calculate an accurate estimate.

The R.S. Means Costworks® data was unable to configure an acceptable value because the specific attributes of the project could not be implemented. As stated in the RS Means discussion, the front-loaded MEP costs, phased renovation work, and exterior restoration scope made it difficult for R.S. Means to develop an accurate estimate. Also, these specific project details could not be applied to the D4 Estimating Software. The D4 Cost Program references previous projects within its database; but there were no projects that fit the specific scope of the Office Renovation Building. Though an office building with a similar square footage was found, it was listed as a new construction project with no renovation details within its scope. Having a reference directory similar to that of the D4 program, a much more accurate square foot estimate may be compiled if there were to be sources of similar scope and size.

| Estimate Type | Total Building Cost | Total SF Cost |
|---------------|---------------------|---------------|
| Actual | \$ 98,397,753.00 | \$ 378.45 |
| RS Means | \$ 28,849,500.00 | \$ 110.96 |
| D4 Cost | \$ 39,191,435.00 | \$ 150.74 |

Table 6: Final Side-by-Side Estimate Summary

Following the analysis of all these estimates, only the actual project estimate performed by Gilbane-Grunley Joint Venture should be considered accurate. The high variance between R.S. Means, D4 Cost, and the actual estimate greatly vary due to the limitations of the applied estimating software. The largest factor includes the MEP system being priced for the entire building and not just the square footage of Phase 2. The cost of demolition, abatement, and historical restoration was unsuccessful to be included within the additional estimates applied. The failure to include such elements of the project scope account for approximately \$35,000,000 in missed costs. Other significant costs include design fees, general conditions, and allowances.

However, R.S. Means and D4 Cost can be an effective tool at the early stages of project development. With the proper applicable scope of work and the right reference of historical data, both programs may be utilized to help a project team gain an approximate perspective of a project's general cost at the earliest stages of implementation.

Existing Conditions and Site Plan

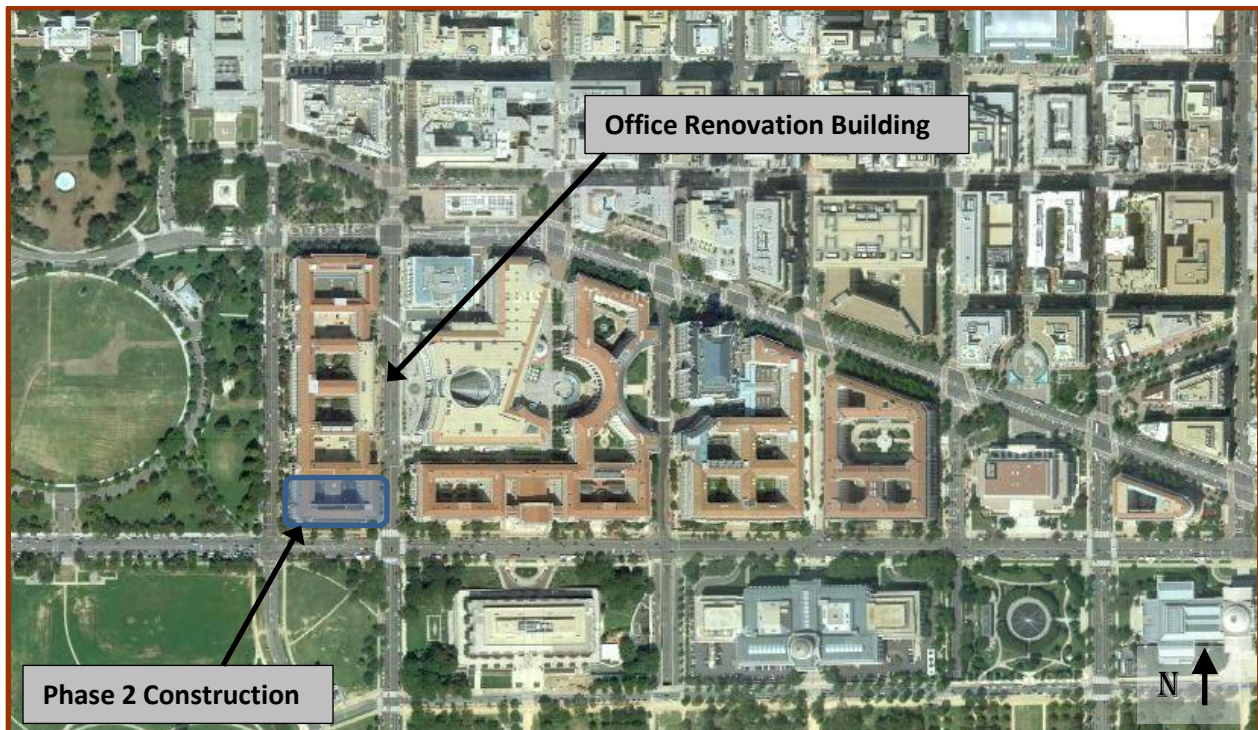


Figure 5: Aerial Map of the Office Renovation Building and adjacent structures courtesy of Google Maps

The Office Renovation Building is located in the downtown historical business district of a northeastern metropolitan area. The specific location of this project may not be disclosed due to owner restrictions. Due to the building's urban setting, the construction site of the project is confined within the structure's perimeter.

Because of the high pedestrian traffic surrounding the facility, public safety is a primary concern for the project's logistics planning and site management. To ensure the safety of the area's pedestrians, the construction zone will be enclosed within appropriate construction fencing as needed. Also, because Phase 2 is comprised of the building's exterior restoration; temporary fencing and overhead protection will be present wherever work is being put in place.

Underground utilities are present all throughout the building's perimeter; fortunately, the project's scope is limited towards the replacement of the facility's electrical ductbank that runs along the eastern side of the building. During the excavation and replacement of this ductbank, Gilbane-Grunley will close the 14th Street sidewalk in phases to allow occupant foot traffic to be redirected towards the other side of the street. For a further, more in depth analysis of the project's existing conditions please reference the site plans listed within **Appendix C: Overall Site Plan and Existing Conditions**.

Local Conditions

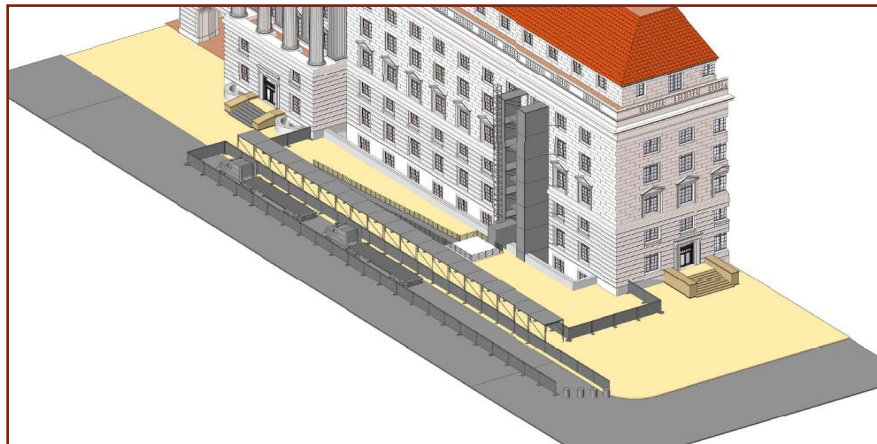
The site conditions and preferred construction methods are typical in comparison to the Office Renovation Building's metropolitan area. The specific location of the building is restricted at the request of the owner. The area is commonly known for reinforced concrete structural systems for low to mid-rise buildings. However, similar to other structures of its time of construction and location, the Office Renovation Building utilizes a steel structural frame encased in cast-in-place concrete. The time of the building's original construction took place prior to today's practice of reinforced concrete and modern day fireproofing systems.

Due to the high density area of which the Office Renovation Building resides, parking availability for construction vehicles is very limited. Project superintendents have acquired minimal parking within one of the building's courtyards. The majority of any on-site parking is reserved for pre-designated building occupants. However, the lower level loading dock under courtyard 5 may be used to park other small construction vehicles only on a day-to-day basis. As per the contract agreement, there is no parking for subcontractors. Fortunately, many workers utilize the metro rail system located within a city block of the building's location. Delivery trucks and other large construction vehicles may only use the west side of the building's designated loading area adjacent to the material hoist; a detail of the staging area can be seen in **Figure 6**. (please refer to **Figure C-1** in **Appendix C** for further detail).

For the metropolitan area, Gilbane-Grunley expenses a standard material dumpster each for \$650. Complying with the project's efforts to attain LEED certification, the storage and collection of recyclables is a highly tracked process. The project delivers and loads the appropriate dumpsters through the courtyard 2 15th Street loading dock; all materials are taken to this area via a designated service elevator within the building.

The subsurface investigations natural soils weathered from bedrock and uncontrolled soil and rock fill. The subsurface explorations identified several ground water conditions close to the bedrock surface. Because the renovation project does not include any structural foundation work, limited detailed information on occurring subsurface condition is available

Figure 6:
Revit rendering of the 15th
Street staging area and
material hoist



Client Information

The General Services Administration is the acting owner on the project. The government organization has taken the initiative to undergo construction for the Office Renovation Building largely in fact that the building's systems are very out of date and inefficient. The Office Renovation Building is the last GSA owned building within the area to undergo a systems and exterior renovation. Also, the Office Building Renovation project is partially funded by the American Reinvestment and Recovery act; a movement established in 2009 to help stimulate the economy during the nation's present day financial downturn.

It is important to understand that though the General Services Administration is the owner of the project, they are not the primary client for the structure's renovation. The Office Renovation Building is home to several federal departments of which will not be listed at the request of the owner. However, it can be noted that the primary clients are typical to that of any office building. Additionally, the project's cliental consists of those associated with tourism within the National Aquarium and the Whitehouse Visitor Center.

The project clients have specifically expressed their greatest concerns and expectations for the building's renovation. Fortunately, this is of great benefit to the Gilbane-Grunley team to help minimize any negative impacts toward the client during construction. Considering that the building is to remain occupied throughout the project's duration, the client is primarily concerned with any distractions that may hinder the productivity of its employees; this includes any fumes, noises, and vibrations during construction. Furthermore, the owner and its affiliates fear that issues may arise in regards to the abatement of any asbestos containing materials. With this, it is crucial to consider the health and safety of the building's occupants and workers as a major priority. Finally, a particular department within the building is concerned about the loss of its premium parking spaces located within the courtyards of the building.

As the general contractor, Gilbane-Grunley has taken a deliberate initiative to insure that the client's concerns are tended to while having minimal impact on the building's occupants. The GGJV team has elaborated on proactive planning and early communication with the owner and the project clients so that they may be fully aware of any impacts during construction. A HAZMAT notification initiative has also been implemented to let the building occupants know if any work is being done relative to their location. Communication has been an essential step in regards to reassuring the client that Gilbane-Grunley is continuously working to meet the owner's expectation for the project.

As previously stated, the Office Building Renovation is designated to remain occupied throughout its construction. Being that the structure houses more than 4,000 employees, it is important that the phased sequencing of construction is successfully implemented. Please refer to **Appendix D: Phase Sequencing** for a brief overview has to how the progress of the Office Building Renovation will move to have minimal impact on the building's occupants.

Project Delivery System

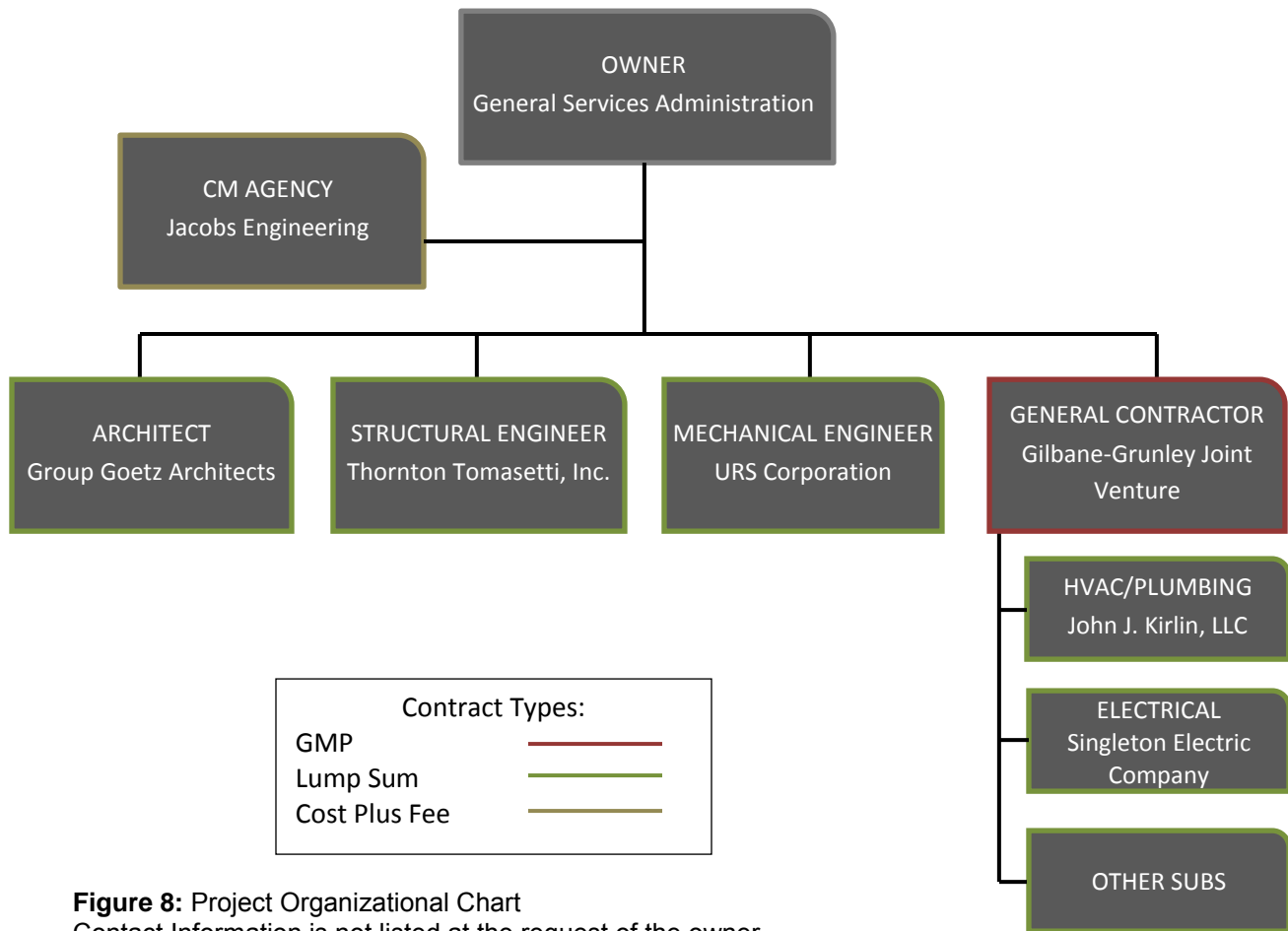


Figure 8: Project Organizational Chart
Contact Information is not listed at the request of the owner

The Office Building Renovation Project utilizes a **Design-Bid-Build with CM Agency** delivery system. The owner has selected to hire a CM Agency due to the project’s size, complexity, and duration. The Design-Bid-Build delivery method is a direct result of the project’s design being completed far earlier than construction had begun. Due to its federal association, the project was forced to wait until funding became readily available. Fortunately, the building’s design was able to benefit from the early contributions of Jacobs Engineering in addition to the Structural and MEP engineering firms. The Office Building Renovation Project is funded largely due to the American Recovery and Reinvestment Act.

Shortly after the building’s design was completed, Gilbane-Grunley Joint Venture was awarded the project due to its ‘Best Value’ bid and past experiences with federal building renovations within the area. Largely in result to the Joint Venture approach, GGJV’s large bonding capacity has allowed the company to carry Builders Risk, General Liability, and Worker’s Compensation Insurance per Federal Law for the project.

Gilbane-Grunley Staffing Plan



Figure 9: GGJV Staffing Plan
 Gilbane: Red, Grunley: Gray

The Gilbane-Grunley Joint Venture team has been specifically created for the sole purpose of the Office Building Renovation project. Both Gilbane Building Company and Grunley Construction have come together for this project in an effort to effectively exchange their backgrounds and expertise to deliver a final product that will meet the client's needs. In addition to the complexity of the renovation, a major reason for such a particularly large project team is to assure that individuals that are well experienced with the project's conditions remain on the job. This is done in an effort to secure involvement in the project's future phases as well as streamlining the construction process of work to come.

All of the project members shown in the organizational chart are fully dedicated to the project while always being on-site. This is done to better facilitate the communication between all the active parties associated with the project. The management staff, particularly the project executive, benefit from the constant on-site interaction between the building's owner and the construction management agency representatives. The entire project staff is housed in a temporary office within a fully occupied and functional portion of the facility.

While each member of the management team carries their own responsibilities specific to the project, the field staff also benefits from their size and specialties. Each superintendent on the project has their own particular focus, ranging from exterior work to sprinkler installment, this is done to help facilitate the progression of the project's construction. For example, one superintendent can be fully dedicated to the site's exterior and utility work while another concentrates on the close out and punch list for a particular area within the facility.

The Gilbane-Grunley Joint Venture benefits from its resourceful project team as it is able to deliver a better quality project more effectively and efficiently.

[APPENDIX A]
PROJECT SCHEDULE SUMMARY

| ID | Task Name | Duration | Start | Finish | 3rd Quarte | 1st Quarte | 3rd Quarte | 1st Quarte | 3rd Quarte | 1st Quarte | 3rd Quarte | 1st Quarte | 3rd Quarte | 1st Quarte | | | | |
|----|--|-----------------|---------------------|---------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|-----|-----|-----|-----|
| | | | | | Jul | Sep | Nov | Jan | Mar | May | Jul | Sep | Nov | Jan | Mar | May | Jul | Sep |
| 1 | Architectural Design and Planning | 430 days | Mon 7/9/07 | Fri 2/27/09 | | | | | | | | | | | | | | |
| 2 | Preconstruction | 235 days | Mon 12/22/08 | Sun 11/15/09 | | | | | | | | | | | | | | |
| 3 | Estimating and Procurement | 236 days | Mon 12/22/08 | Sun 11/15/09 | | | | | | | | | | | | | | |
| 4 | Finance Closing | 0 days | Sun 11/15/09 | Sun 11/15/09 | | | | | | | | | | | | | | |
| 5 | Notice to Proceed | 0 days | Sun 11/15/09 | Sun 11/15/09 | | | | | | | | | | | | | | |
| 6 | Construction | 522 days | Sun 11/15/09 | Tue 11/15/11 | | | | | | | | | | | | | | |
| 7 | Mobilization and Tennant Relocation | 23 days | Sun 11/15/09 | Tue 12/15/09 | | | | | | | | | | | | | | |
| 8 | Project Team Relocation from PH1 | 14 days | Tue 12/15/09 | Fri 1/1/10 | | | | | | | | | | | | | | |
| 9 | Dust Partitons | 80 days | Mon 1/4/10 | Fri 4/23/10 | | | | | | | | | | | | | | |
| 10 | Electrical | 411 days | Mon 1/11/10 | Mon 8/8/11 | | | | | | | | | | | | | | |
| 11 | Mechanical | 444 days | Mon 1/25/10 | Thu 10/6/11 | | | | | | | | | | | | | | |
| 12 | Site Utilities | 449 days | Mon 2/1/10 | Thu 10/20/11 | | | | | | | | | | | | | | |
| 13 | Complete Move-In Space from PH1 | 92 days | Tue 2/2/10 | Wed 6/9/10 | | | | | | | | | | | | | | |
| 14 | Masonry Restoration | 452 days | Mon 2/22/10 | Tue 11/15/11 | | | | | | | | | | | | | | |
| 15 | Soft Demolition on all Floors | 46 days | Mon 3/8/10 | Mon 5/10/10 | | | | | | | | | | | | | | |
| 16 | Interior Renovations 7th Floor | 401 days | Mon 3/8/10 | Mon 9/19/11 | | | | | | | | | | | | | | |
| 17 | Interior Renovations 6th Floor | 406 days | Mon 3/15/10 | Mon 10/3/11 | | | | | | | | | | | | | | |
| 18 | Interior Renovations 5th Floor | 391 days | Mon 3/22/10 | Mon 9/19/11 | | | | | | | | | | | | | | |
| 19 | Interior Renovations 4th Floor | 386 days | Mon 3/29/10 | Mon 9/19/11 | | | | | | | | | | | | | | |
| 20 | Interior Renovations 3rd Floor | 391 days | Mon 4/5/10 | Mon 10/3/11 | | | | | | | | | | | | | | |
| 21 | Roof | 373 days | Tue 4/6/10 | Thu 9/8/11 | | | | | | | | | | | | | | |
| 22 | Interior Renovations 2nd Floor | 396 days | Mon 4/12/10 | Mon 10/17/11 | | | | | | | | | | | | | | |
| 23 | Interior Renovations 1st Floor | 410 days | Mon 4/19/10 | Fri 11/11/11 | | | | | | | | | | | | | | |
| 24 | Abatement | 370 days | Mon 5/10/10 | Fri 10/7/11 | | | | | | | | | | | | | | |
| 25 | EEE Work | 257 days | Wed 9/1/10 | Thu 8/25/11 | | | | | | | | | | | | | | |
| 26 | Risers | 144 days | Mon 9/13/10 | Thu 3/31/11 | | | | | | | | | | | | | | |
| 27 | Ramps | 157 days | Thu 2/3/11 | Fri 9/9/11 | | | | | | | | | | | | | | |
| 28 | Commissioning | 329 days | Mon 7/26/10 | Thu 10/27/11 | | | | | | | | | | | | | | |
| 29 | Punchlist | 65 days | Fri 8/12/11 | Thu 11/10/11 | | | | | | | | | | | | | | |

| | | | |
|---|-------------|---|------|
| Project Schedule Summary Date: Sun 10/3/10 | Milestone ◆ | Summary | Task |
| Anthony Jurjevic | | Office Renovation Building: Phase 2 Northeast, United States | |


[APPENDIX B-1]

RSMMeans Costworks® 2010 Estimate Report

RSMMeans CostWorks® Square Foot Estimate (Renovation Phase II)

Square Foot Cost Estimate Report

| | |
|--|--|
| Estimate Name: Office Renovation Building | |
| Building Type: | Office, 5-10 Story with Limestone Panel Concrete Block Back-up /R/Conc. Frame |
| Location: | Not Listed |
| Story Count: | 8 |
| Story Height (L.F.): | 12 |
| Floor Area (S.F.): | 260000 |
| Labor Type: | Open Shop |
| Basement Included: | Yes |
| Data Release: | Year 2010 Quarter 3 |
| Cost Per Square Foot: | \$110.96 |
| Building Cost: | \$28,849,500 |



Costs are derived from a building model with basic components. Scope differences and market conditions can cause costs to vary significantly.

| | | % of Total | Cost Per S.F. | Cost |
|-----------------------|--|---------------|----------------|--------------------|
| A Substructure | | 2.60% | \$2.93 | \$761,500 |
| A1010 | Standard Foundations Strip footing, concrete, reinforced, load 14.8 KLF, soil bearing capacity 6 KSF, 12" deep x 32" wide Spread footings, 3000 PSI concrete, load 500K, soil bearing capacity 6 KSF, 9' - 6" square x 30" deep | | \$1.42 | \$370,000 |
| A1030 | Slab on Grade Slab on grade, 4" thick, non industrial, reinforced | | \$0.56 | \$145,500 |
| A2010 | Basement Excavation Excavate and fill, 10,000 SF, 8' deep, sand, gravel, or common earth, on site storage | | \$0.36 | \$94,500 |
| A2020 | Basement Walls Foundation wall, CIP, 12' wall height, pumped, .52 CY/LF, 24.29 PLF, 14" thick | | \$0.58 | \$151,500 |
| B Shell | | 30.70% | \$34.02 | \$8,844,000 |
| B1010 | Floor Construction Cast-in-place concrete column, 20" square, tied, 500K load, 12' story height, 394 lbs/LF, 4000PSI Cast-in-place concrete column, 20" square, tied, 800K load, 12' story height, 394 lbs/LF, 6000PSI Cast-in-place concrete column, 20" square, tied, 900K load, 12' story height, 394 lbs/LF, 6000PSI Cast-in-place concrete column, 20", square, tied, minimum reinforcing, 500K load, 10'-14' story height, 375 lbs/LF, 4000PSI Flat slab, concrete, with drop panels, 6" slab/2.5" panel, 12" column, 15'x15' bay, 75 PSF superimposed load, 153 PSF total | | \$16.80 | \$4,367,000 |

| | | | | |
|--------------------|--|----------------|--------------------|--------------------|
| | load | | | |
| | Flat plate, concrete, 9" slab, 20" column, 20'x25' bay, 75 PSF superimposed load, 188 PSF total load | | | |
| B1020 | Roof Construction | \$1.52 | \$394,000 | |
| | Floor, concrete, beam and slab, 20'x25' bay, 40 PSF superimposed load, 18" deep beam, 8.5" slab, 146 PSF total load | | | |
| B2010 | Exterior Walls | \$13.13 | \$3,414,500 | |
| | Stone wall, Indiana limestone, smooth finish, 4" thick, 8' high, 8" CMU back-up | | | |
| B2020 | Exterior Windows | \$1.80 | \$469,000 | |
| | Windows, aluminum, sliding, insulated glass, 5' x 3' | | | |
| B2030 | Exterior Doors | \$0.22 | \$58,000 | |
| | Door, aluminum & glass, with transom, narrow stile, double door, hardware, 6'-0" x 10'-0" opening | | | |
| | Door, steel 18 gauge, hollow metal, 1 door with frame, no label, 3'-0" x 7'-0" opening | | | |
| B3010 | Roof Coverings | \$0.54 | \$141,500 | |
| | Roofing, asphalt flood coat, gravel, base sheet, 3 plies 15# asphalt felt, mopped | | | |
| | Insulation, rigid, roof deck, composite with 2" EPS, 1" perlite | | | |
| | Roof edges, aluminum, duranodic, .050" thick, 6" face | | | |
| | Flashing, aluminum, no backing sides, .019" | | | |
| C Interiors | | 19.70% | \$21.84 | \$5,679,500 |
| C1010 | Partitions | \$1.82 | \$472,000 | |
| | Metal partition, 5/8" water resistant gypsum board face, no base layer, 3-5/8" @ 24" OC framing ,same opposite face, no insulation | | | |
| | 1/2" fire rated gypsum board, taped & finished, painted on metal furring | | | |
| C1020 | Interior Doors | \$2.50 | \$649,000 | |
| | Door, single leaf, kd steel frame, hollow metal, commercial quality, flush, 3'-0" x 7'-0" x 1-3/8" | | | |
| C1030 | Fittings | \$0.67 | \$175,000 | |
| | Toilet partitions, cubicles, ceiling hung, plastic laminate | | | |
| C2010 | Stair Construction | \$2.62 | \$681,000 | |
| | Stairs, steel, cement filled metal pan & picket rail, 16 risers, with landing | | | |
| C3010 | Wall Finishes | \$0.81 | \$211,500 | |
| | Painting, interior on plaster and drywall, walls & ceilings, roller work, primer & 2 coats | | | |
| | Vinyl wall covering, fabric back, medium weight | | | |
| C3020 | Floor Finishes | \$7.78 | \$2,023,000 | |
| | Carpet, tufted, nylon, roll goods, 12' wide, 36 oz | | | |
| | Carpet, padding, add to above, minimum | | | |
| | Vinyl, composition tile, maximum | | | |
| | Tile, ceramic natural clay | | | |

| | | | | |
|-------------------|---|---------------|----------------|---------------------|
| C3030 | Ceiling Finishes Acoustic ceilings, 3/4" mineral fiber, 12" x 12" tile, concealed 2" bar & channel grid, suspended support | | \$5.65 | \$1,468,000 |
| D Services | | 47.00% | \$52.17 | \$13,564,500 |
| D1010 | Elevators and Lifts Traction, geared passenger, 3500 lb, 8 floors, 12' story height, 2 car group, 200 FPM | | \$15.19 | \$3,948,500 |
| D2010 | Plumbing Fixtures Water closet, vitreous china, bowl only with flush valve, wall hung Urinal, vitreous china, wall hung Lavatory w/trim, vanity top, PE on CI, 20" x 18" Service sink w/trim, PE on CI, wall hung w/rim guard, 24" x 20" Water cooler, electric, wall hung, 8.2 GPH Water cooler, electric, wall hung, wheelchair type, 7.5 GPH | | \$2.05 | \$534,000 |
| D2020 | Domestic Water Distribution Gas fired water heater, commercial, 100< F rise, 200 MBH input, 192 GPH | | \$0.47 | \$122,500 |
| D2040 | Rain Water Drainage Roof drain, CI, soil, single hub, 5" diam, 10' high Roof drain, CI, soil, single hub, 5" diam, for each additional foot add | | \$0.22 | \$57,500 |
| D3050 | Terminal & Package Units Rooftop, multizone, air conditioner, offices, 25,000 SF, 79.16 ton | | \$14.15 | \$3,679,500 |
| D4010 | Sprinklers Wet pipe sprinkler systems, steel, light hazard, 1 floor, 10,000 SF Wet pipe sprinkler systems, steel, light hazard, each additional floor, 10,000 SF Standard High Rise Accessory Package 8 story | | \$2.40 | \$624,000 |
| D4020 | Standpipes Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, 1 floor Wet standpipe risers, class III, steel, black, sch 40, 4" diam pipe, additional floors Fire pump, electric, with controller, 5" pump, 100 HP, 1000 GPM Fire pump, electric, for jockey pump system, add | | \$0.62 | \$162,000 |
| D5010 | Electrical Service/Distribution Service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 V, 1600 A Feeder installation 600 V, including RGS conduit and XHHW wire, 60 A Feeder installation 600 V, including RGS conduit and XHHW wire, 200 A Feeder installation 600 V, including RGS conduit and XHHW wire, 1600 A Switchgear installation, incl switchboard, panels & circuit | | \$0.57 | \$149,000 |

| | | | | |
|--------------------------------------|--|----------------|--------------------|------------|
| | breaker, 1600 A | | | |
| D5020 | Lighting and Branch Wiring Receptacles incl plate, box, conduit, wire, 16.5 per 1000 SF, 2.0 W per SF, with transformer Miscellaneous power, 1.2 watts Central air conditioning power, 4 watts Motor installation, three phase, 460 V, 15 HP motor size Motor feeder systems, three phase, feed to 200 V 5 HP, 230 V 7.5 HP, 460 V 15 HP, 575 V 20 HP Motor connections, three phase, 200/230/460/575 V, up to 5 HP Motor connections, three phase, 200/230/460/575 V, up to 100 HP Fluorescent fixtures recess mounted in ceiling, 1.6 watt per SF, 40 FC, 10 fixtures @32watt per 1000 SF | \$10.56 | \$2,744,500 | |
| D5030 | Communications and Security Telephone wiring for offices & laboratories, 8 jacks/MSF Communication and alarm systems, fire detection, addressable, 100 detectors, includes outlets, boxes, conduit and wire Fire alarm command center, addressable with voice, excl. wire & conduit Internet wiring, 8 data/voice outlets per 1000 S.F. | \$4.89 | \$1,272,000 | |
| D5090 | Other Electrical Systems Generator sets, w/battery, charger, muffler and transfer switch, diesel engine with fuel tank, 100 kW Uninterruptible power supply with standard battery pack, 15 kVA/12.75 kW | \$1.04 | \$271,000 | |
| E Equipment & Furnishings | | 0.00% | \$0.00 | \$0 |
| E1090 | Other Equipment | | \$0.00 | \$0 |
| F Special Construction | | 0.00% | \$0.00 | \$0 |
| G Building Sitework | | 0.00% | \$0.00 | \$0 |

| | | | |
|---|--------------|-----------------|---------------------|
| Subtotal | 100% | \$110.96 | \$28,849,500 |
| Contractor Fees (General Conditions, Overhead, Profit) | 0.00% | \$0.00 | \$0 |
| Architectural Fees | 0.00% | \$0.00 | \$0 |
| User Fees | 0.00% | \$0.00 | \$0 |
| Total Building Cost | | \$110.96 | \$28,849,500 |

[APPENDIX B-2]**D4 Cost Estimate Report 2010**

Please note that the following pages are direct imports from the D4 Cost Report Program due to formatting restrictions and limitations

Statement of Probable Cost

Office Renovation Building - Nov 2010 - District of Columbia

Prepared By: **Anthony Jurjevic**

Prepared For:

Building Sq. Size: **260000**
 Bid Date: **8/1/2010**
 No. of floors: **8**
 No. of buildings: **1**
 Project Height: **90**
 1st Floor Height: **12**
 1st Floor Size: **32000**

Site Sq. Size: **239425**
 Building use: **Office**
 Foundation: **CON**
 Exterior Walls: **EXT**
 Interior Walls: **GYP**
 Roof Type: **CLY**
 Floor Type: **MAS**
 Project Type: **ADD/REN**

| Division | | Percent | Sq. Cost | Amount |
|-----------|--|--------------|--------------|------------------|
| 00 | Bidding Requirements | 2.14 | 3.02 | 784,300 |
| | Permits | 0.56 | 0.79 | 206,184 |
| | Site Security | 0.19 | 0.26 | 67,777 |
| | Testing | 0.17 | 0.24 | 62,270 |
| | Insurance | 1.06 | 1.49 | 387,485 |
| | Civil Engineer | 0.17 | 0.23 | 60,583 |
| 01 | General Requirements | 12.81 | 18.03 | 4,688,321 |
| | Architect Fee | 6.06 | 8.54 | 2,219,472 |
| | General Requirements | 4.52 | 6.37 | 1,656,091 |
| | Contractor Fee | 2.22 | 3.13 | 812,759 |
| 03 | Concrete | 19.43 | 27.36 | 7,114,692 |
| | Cast-In-Place | 19.43 | 27.36 | 7,114,692 |
| 04 | Masonry | 1.78 | 2.51 | 651,896 |
| | Unit | 0.50 | 0.70 | 182,302 |
| | Architectural Stone Flooring | 1.28 | 1.81 | 469,594 |
| 05 | Metals | 9.45 | 13.31 | 3,461,024 |
| | Architectural Metal Framing | 4.66 | 6.56 | 1,704,575 |
| | Fabrications | 2.32 | 3.27 | 849,943 |
| | Ornamental | 2.48 | 3.49 | 906,507 |
| 06 | Wood & Plastics | 0.20 | 0.28 | 73,229 |
| | Rough Carpentry | 0.05 | 0.08 | 19,964 |
| | Finish Carpentry | 0.15 | 0.20 | 53,266 |
| 07 | Thermal & Moisture Protection | 12.46 | 17.54 | 4,560,715 |
| | Structural Glazing | 11.43 | 16.09 | 4,183,320 |
| | Waterproofing | 0.11 | 0.16 | 40,716 |
| | Firestopping | 0.19 | 0.27 | 69,502 |
| | Membrane Roofing | 0.73 | 1.03 | 267,178 |
| 08 | Doors & Windows | 10.01 | 14.09 | 3,664,100 |
| | Metal Doors & Frames | 0.17 | 0.24 | 61,415 |
| | Special Doors | 0.44 | 0.62 | 159,968 |
| | Glazed Curtainwalls | 9.16 | 12.90 | 3,352,990 |
| | Interior/Exterior Glass Cleaning | 0.25 | 0.35 | 89,728 |
| 09 | Finishes | 1.42 | 2.00 | 520,202 |
| | Metal Studs & Drywall | 1.00 | 1.42 | 367,915 |
| | Ceramic Tile | 0.31 | 0.44 | 113,697 |
| | Resilient Flooring | 0.00 | 0.00 | 1,002 |
| | Painting | 0.10 | 0.14 | 37,589 |
| 10 | Specialties | 3.32 | 4.67 | 1,214,554 |
| | Raised Access Floor | 2.96 | 4.17 | 1,082,943 |
| | Toilet Partitions | 0.28 | 0.39 | 102,590 |
| | Louvers | 0.08 | 0.11 | 29,021 |
| 12 | Furnishings | 1.26 | 1.78 | 462,494 |
| | Window Treatment Furnish | 1.18 | 1.67 | 433,278 |

Sunday, October 3, 2010

| | | | | |
|---------------------------------|--------------------------|---------------|---------------|-------------------|
| | Window Treatment Install | 0.08 | 0.11 | 29,216 |
| 14 | Conveying Systems | 4.37 | 6.15 | 1,598,099 |
| | Elevators | 3.70 | 5.21 | 1,353,459 |
| | Hoists & Cranes | 0.67 | 0.94 | 244,640 |
| 15 | Mechanical | 13.57 | 19.11 | 4,967,911 |
| | Plumbing | 1.46 | 2.06 | 535,352 |
| | Fire Protection | 2.02 | 2.85 | 741,220 |
| | HVAC | 10.08 | 14.20 | 3,691,339 |
| 16 | Electrical | 7.78 | 10.96 | 2,849,141 |
| | Service & Distribution | 7.78 | 10.96 | 2,849,141 |
| Total Building Costs | | 100.00 | 140.81 | 36,610,679 |
| 02 | Site Work | 100.00 | 10.40 | 2,490,756 |
| | Preparation | 2.93 | 0.30 | 72,946 |
| | Earthwork | 21.29 | 2.22 | 530,349 |
| | Caissons | 12.41 | 1.29 | 309,043 |
| | Paving & Surfacing | 24.05 | 2.50 | 599,112 |
| | Utilities #1 | 20.08 | 2.09 | 500,115 |
| | Utilities #2 | 4.11 | 0.43 | 102,323 |
| | Landscaping | 15.13 | 1.57 | 376,868 |
| Total Non-Building Costs | | 100.00 | 10.40 | 2,490,756 |
| Total Project Costs | | -- | -- | 39,101,435 |

[APPENDIX C]

OVERALL SITE PLAN AND EXISTING CONDITIONS

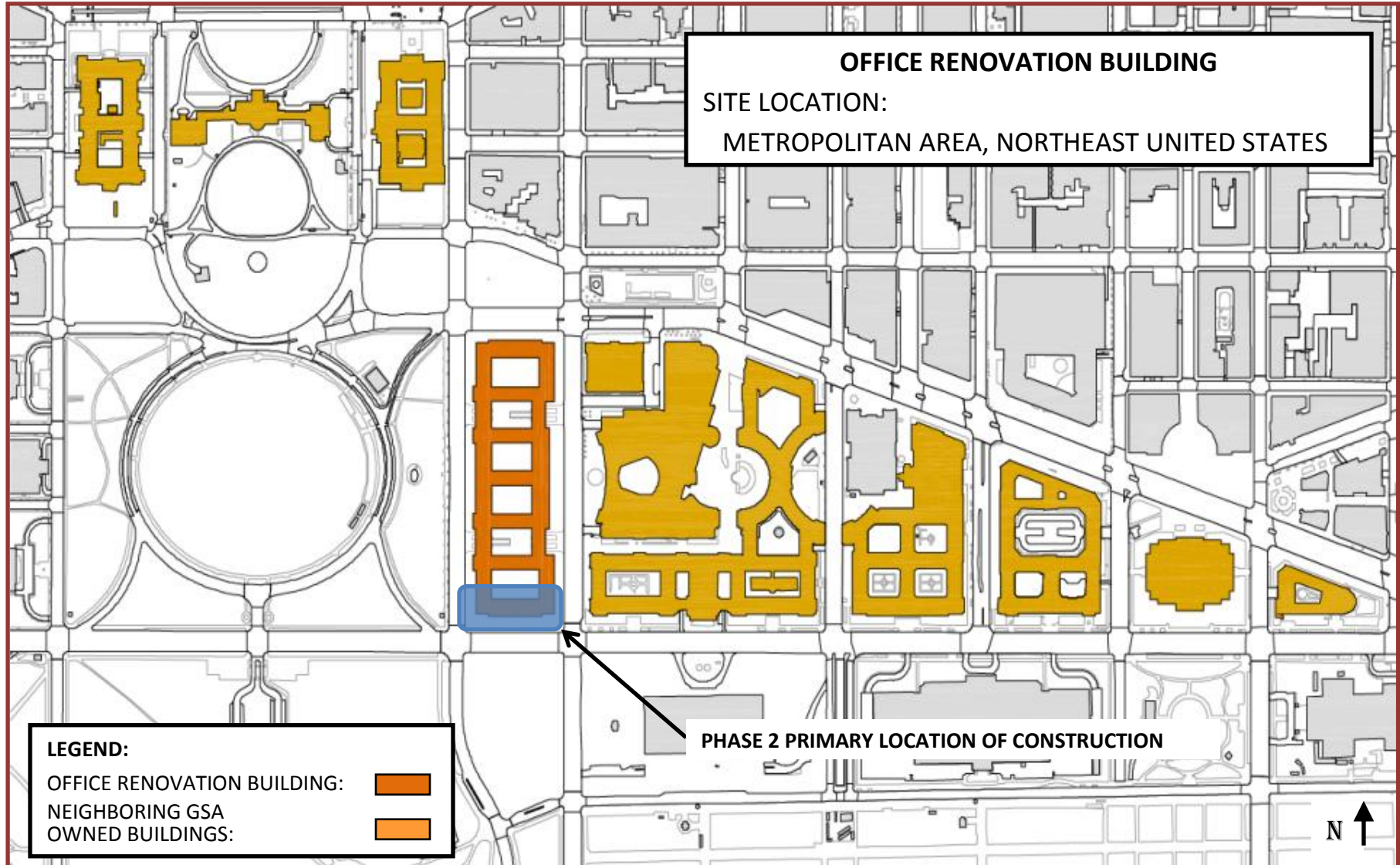
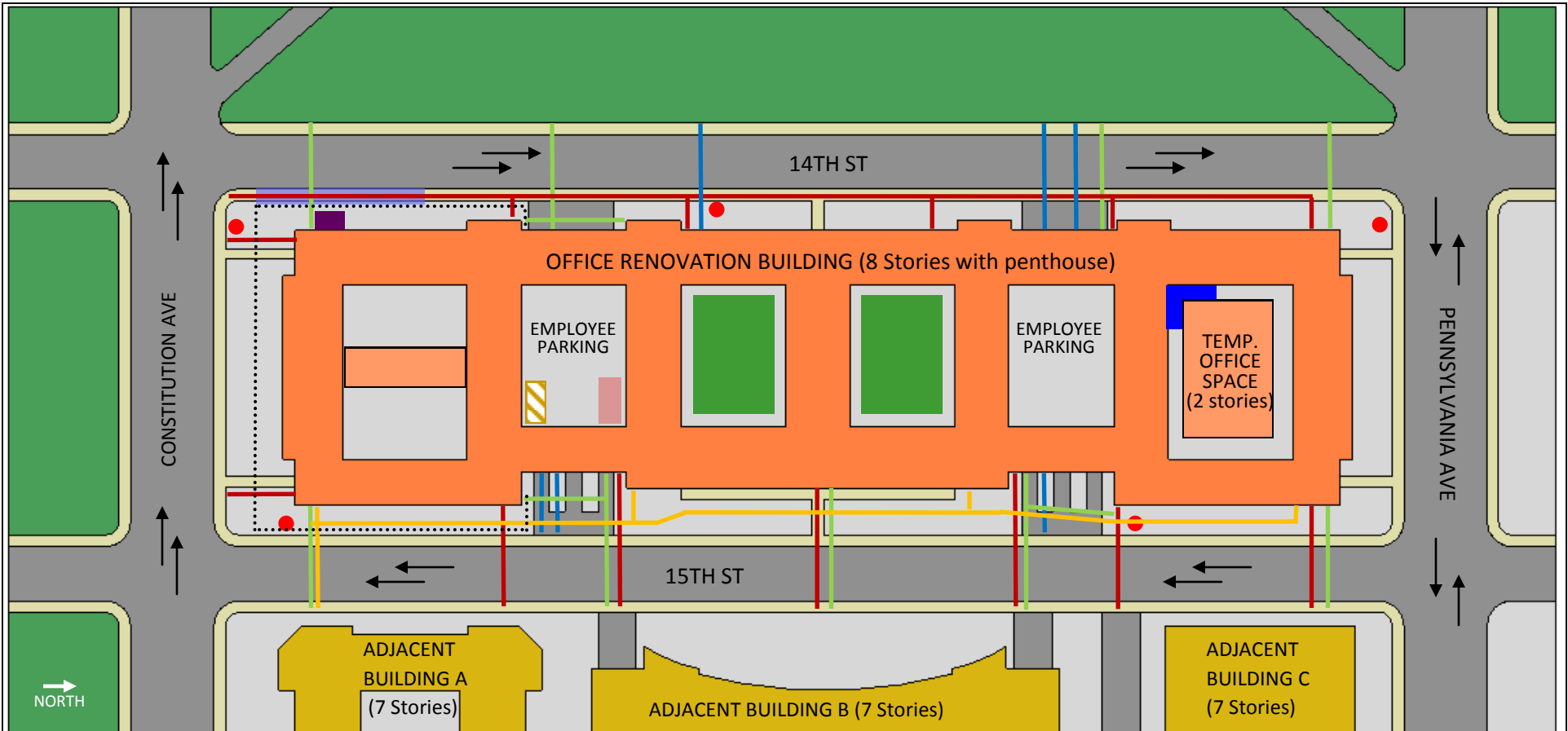


Figure C-1: Site Plan and Building Location

Please note that the specific region and location of the Office Renovation Building is not listed as per the request of the owner



EXISTING UTILITIES:

- STORM —
- SANITARY —
- WATER —
- POWER —

SYMBOLS:

- PEDESTRIAN WALKWAY
- VEHICULAR TRAFFIC →
- CONSTRUCTION FENCE
- FIRE HYDRANT ●
- GC OFFICE
- SUPERINTENDENT PARKING
- MATERIAL HOIST
- COVERED WALKWAY
- MATERIAL WAIST CONTAINERS (BASEMENT LEVEL)

OFFICE BUILDING RENOVATION

EXISTING CONDITIONS SITE PLAN

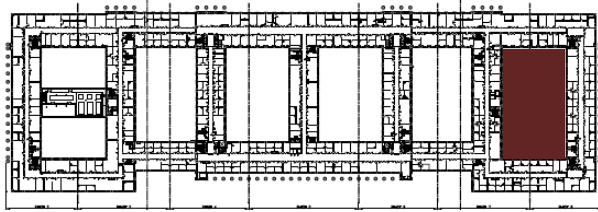
OCTOBER 4, 2010

ANTHONY JURJEVIC- CM

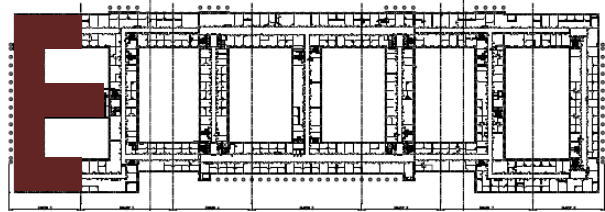
ADJACENT BUILDING NAMES HAVE BEEN RENAMED AT THE REQUEST OF THE OWNER
 PHASE 2 OF CONSTRUCTION CAN BE SPECIFIED IN FIGURE X ON PAGE Y

[APPENDIX D]
PHASE SEQUENCING

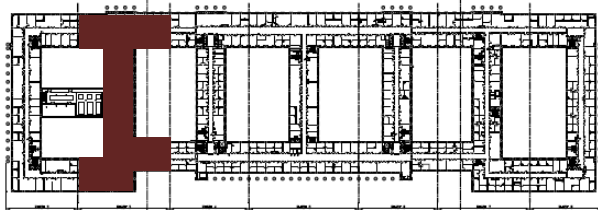
The images below illustrate the phase sequencing of construction. Phase 1 consisted of an office space for building occupants to relocate to when their building sections are under construction.



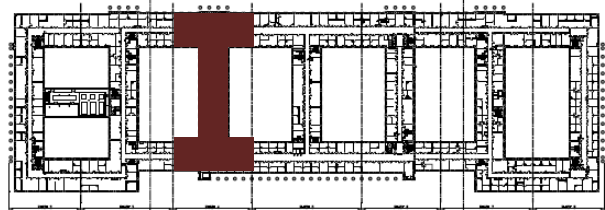
Phase 1: Construction of new temporary office space in courtyard 6 to house relocated occupants



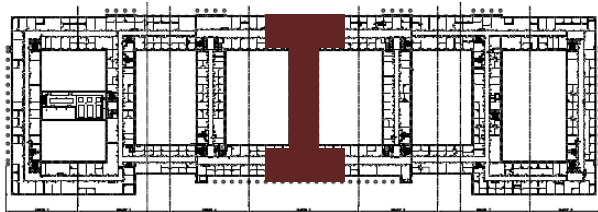
Phase 2: New MEP Infrastructure including chiller plant and new Electrical Equipment Enclosure in courtyard 1. Complete façade restoration and office renovations on 7 floors



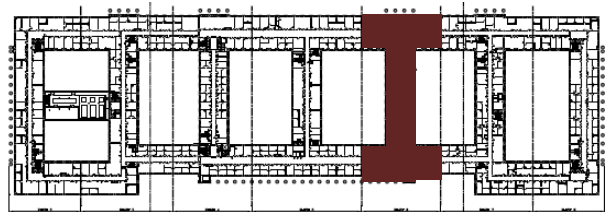
Phase 3: System replacement on all floors and repaving of courtyard 2



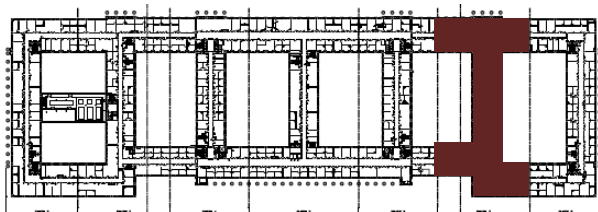
Phase 4: System replacement on all floors



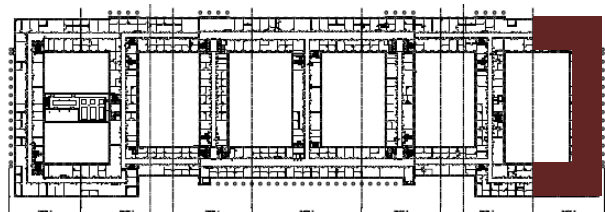
Phase 5: System replacement on all floors including auditorium, main entrance lobby, and mass transit tunnel



Phase 6: System replacement on all floors and courtyard 5 loading dock part 1



Phase 7: System replacement on all floors and courtyard 5 loading dock part 2



Phase 8: System replacement on all floors and tourist visitor center upgrades

