Square 320 Project

1199 F Street NW Wash, DC

Michael Webb
Construction Management

Executive Summary

The Square 320 Project is favorably located at 1199 F Street NW, the corner of 11th and F, in the resurgent East End submarket of Washington DC. Square 320 incorporates the renovation of four historic buildings with the new construction of a 12-story Class A office building. This exciting renovation project sits on top of 5-stories of below-grade parking totaling 76,075SF and offering 167 parking spaces. Above grade, the new 12-story concrete tower and the renovated historic buildings will together create 360,601SF of rentable office space.

The building skin, a custom curtain-wall designed by famed architectural firm Pei Cobb Freed, is just one of many attempts made in this project to appeal to a wealthier base. Additional dramatic features in this project including structural steel bridges that connect the bronze and aluminum curtain wall system to the restored historic masonry buildings, all under the cover of a 110-foot skylight and highly appointed stone-top restrooms, a green roof, and the copper panelized skin.

The renovation work being performed has been very well thought out with nearly every effort made to preserve the historical aspects of the four buildings and return them to their original state. Specifically, the traditional terracotta floor will not only remain but will be strengthened through the installation of a supplementary steel support system with composite deck. At every step along the way, first the design firms and now the managers are making every step to ensure the historical integrity of the traditionally brick buildings will be maintained with special attention shown to the wooden windows, exterior masonry, brown stone, ornamental copper, and galvanized sheet metal. It is evident that the architecture of the new building was based heavily on consideration of such materials. The historic storefronts will be replicated with an aluminum system of decorative stone and cast iron ornaments at the street level.

Douglas Development, the project's developer, has played a significant role in the rejuvenation of the older run-down East End neighborhood in Washington DC. Douglas sees this part of the city as an exciting new place to gather and live in luxury and continue to spearhead the development in the area. One of the exciting aspects of this project is the challenge of understanding the complex business relationships between the owner, developer, architects, and contractor. Official records point to Jema's Square 320 as the project owner; however it appears as though the majority of the owner's role is performed by Douglas Development.

In short, Square 320 is an ideal place to work in Washington, DC with luxury office space offering a very close proximity to the museums, sporting events, and the DC nightlife. When you combine that with a posh consumer shopping district, the East End will be a very popular place to be.0

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Project Schedule Summary

The initial observation that must be discussed is the apparent duality of this project. Working towards both renovation and new construction on a single site creates a minor tension between the varying aspects of work going on at any one moment. The project schedule breaks down the construction activities of both the new 12-story Tower as well as the 4 building renovation. There are significant activities that need to be addressed like the tenant improvements activity from the tower construction.

Douglas doesn't not have the ability to phase the occupancy of their office space. DC law strictly rules that nobody can move in until the entire building has been inspected and the GC and then the owner are granted approval. However, while that might appear as a loss to the owner it enables each firm to fully customize their working spaces. It is for that reason that the Tenant improvements item was included, because that is the important moment that tenants' subcontractors are allowed to enter the site to begin custom fit-out to the firm's request.

While the majority of the activities are straight forward the distinction needed to be made between substantial completion and final completion. Substantial completion comes first and marks the beginning of the time that the new tenants can move in, but there is still 90 days responsibility on the contractor to replace, fix, and repair anything that does wrong. It is then at the final completion day when the contractor is no longer responsible, officially closes out, and can move on to focus on the next project.

Building Systems Summary

Demolition Required

With the renovation work occurring alongside of new construction there was a considerable amount of demolition required on this project. Demolition was required on both parts of the site. The renovation site consisted of 7,400 SF removal by hand with the allowance for selective appurtenances to remain intact. Some of the work included lead paint abatement and the removal of interior framing, finishes, and roof system keeping intact the terracotta flooring system. On the tower site there was a small two story brick building with a basement that resulted in just over 32,000 SF of demolition and removal from the site. The majority of the hazardous material was remediated and removed from that portion of the site prior to Davis' involvement. For that reason little is known of the contents and materials present prior to excavation.

Structural Steel Frame

The new construction consisted of solely cast-in-place concrete and the only place structural steel was implemented was in the support of the restoration projects. Great effort was made to preserve the original terracotta flooring of the historic buildings but additional support was required. On the first floor of the Nordlinger building metal deck was filled with concrete to achieve the desired design load. The structural systems consist mainly of W14X22 and W16X36 girders supporting 3"-20guage composite metal deck with a lightweight concrete slab of 3 ¼", 6 ¼" total depth. The project utilized two tower cranes with one located directly between the concrete tower and the historic BW building facing F street

Cast in Place Concrete

Due to the height restrictions in the District of Columbia, cast-in-place was chosen as the structural system for the 12-story office tower. The construction of the 5-story underground parking garage included a series of foundation walls ranging between 12"-16", just under 4,000 CYs for a 42" mat foundation, and nearly 80,000 SF of 8" suspended drop slabs. In order to achieve the desired full span, the garage did include post-tensioning in selected girders. The formwork for the garage portion was all multi-use plywood and the tower crane enabled the use of placement with crane and bucket.

As the garage transitioned to the tower, the design changed slightly as the live load requirements altered. The tower utilized 210,000 SF of 7" suspended slab design with 10" drop panels and 100 CYs of post tensioned transfer girders. The tower construction utilized more multi-use plywood as the tower crane placed the concrete with crane and bucket over the course of 24 weeks.

Precast Concrete

There is no precast concrete on this project, despite expecting to see it utilized in the parking garage. Additionally, the structural systems are comprised of either cast-in-place slab ands with drop-panels or composite metal deck with 3" of lightweight concrete. This should free up the site by minimizing deliveries and the crane by only requiring the use of crane & bucket over the course of the structural phase.

Mechanical System

The mechanical system is built upon a series of variable volume (V-VAV) self contained water cooled AC units with one on every floor. Next in line are two plate and frame heat exchangers leading to the HVAC penthouse on the roof. There, two inducted draft propeller fan cooling towers rest integrated into the green roof, each weighing 28,000 lbs and capable of pushing 1800GPM and 149,090 CFM. In addition, on each floor a series of traditional ductwork transfers the treated air throughout the spaces. Both cooling towers will be picked by the tower crane located in the atrium space between the tower and the BW Annex. With tight plenum space ranging from 9" at its tightest point and 18" at its widest point, coordination will be key.

The plumbing plan takes advantage of a wet stack attached to alternating concrete columns to minimize on excess piping. The system includes and requires hot water heaters at not only the fitness center on B1 but also two in the bottom of the basement B-5 and two in the penthouse.

Electrical System

As the basement level of the office tower, the buildings power comes from a 4000Amp and 3000Amp. The 4000 Amp switchboard feeds a 4000A 480/277V, 3ø, 100,000 A.I.C.Amp feeder busway running the full height of the tower while the 3000A 480/277V, 3ø, 100,000 A.I.C. switchboard offers the redundancy for emergency power. For additional emergency precautions, the hospital has a single 600 kW, 480/277V, 3ø generator with a 4W Diesel GENSET w/ 50 Gal. day tank. In the office tower, each floor has an electrical room with houses a 400-Amp fusible plug-in busway switch in addition to both 120V and 277V J-boxes. Throughout the historical buildings side, electric rooms are set-up the same way. This project is not working to gain credit from the TP1 transformer standard. The historic buildings are led by a 225 kVA dry type transformer powering every floor while a team of weaker ones ranging from 30-113 KVa. The lighting system consists of three real cores groups, metal halides for the garage, recessed fluorescents, and low-voltage adjustable accent-lights all over the class-A interior spaces.

Masonry

CMUs were used to form a series of walls on the first level both for utility sake and to back-up stone façade. In addition, 13,000 SF of CMUs formed walls on the North elevation. These walls were mostly not load bearing and formed a firewall between the tower and the existing buildings to the north. Pei Cobb Fried & Associates implemented a custom design curtain wall that incorporated a repeating pattern of masonry separated by two glazing panels on the first two floors and five panels for the remaining levels. Stonework on the façade of the ground level is scheduled to begin in October of 2008 and last for 30-45 days. The high-end appointed stone in the lobby is scheduled to occur towards the end of the project around January for 2009. There is some masonry restoration of the historic buildings, but those items are off the critical path and won't take place until foot. The historic buildings will already have scaffolding

up from the paint abatement and façade cleaning so will not be a need to rebuild a scaffolding system when the time comes to hang the bring, etc.

Curtain Wall

Douglas brought in the highly respected architectural firm of Pei Cobb Fried & Associates to design a fully custom, signature curtain wall that would represent the high-end luxury that that Douglas wanted to convey to tenant. The curtain wall consists of full height glazing panels with architectural bronze and decorative stone. Sections are installed by tower crane and hung from concrete levels. At each concrete floor a sill plate extends out and down creating a lip-like channel for the hooks of the curtain wall system to fall into and transfer weight to. The steel tubing bolted to the concrete floor runs horizontally down the length building and provides an additional support 5/8" steel plate sill for the curtain wall system to rest on. Above and below each of the connections are solid panels of bronze that add the style and color to the curtain wall. The curtain wall system went through mock-up testing at two locations off-site. It was graded on infiltration, water penetration, and structural performance against referenced test standards. The curtain wall system experienced significant leaking during the testing period and required three mock-up tests before successfully passing. Additionally, the highly customized glazing mullion required significant effort to ensure proper installation.

Excavation Support

The Square 320 project excavated nearly 100 feet below the ground level in order to prepare the way for the 5-story 76,000 SF parking garage that would become the foundation for the 12-story office tower. Before the excavation would be allowed to move forward an extensive dewatering plan had to be created to account for heavy water infiltration into the sight. The dewatering plan consisted of 6 well points along the perimeter of the site continuously discharging directly into the storm sewers in excess of 30,000 GPM. The system was monitored frequently from piezometers on the west and south of the site. Once the system was in place the site was excavated and the support system was built. The supports consisted of a comprehensive system of tiebacks, lagging, tangent piles along 12th street, heavy steel diagonal bracing, and discontinuous underpinning at each level. The majority of the support system was a permanent system with the exception of the large tubular supports that can be seen in the image below.

Fig. 1 – Excavation Support System

Project Cost Evaluation

This report will be evaluating the project cost information from the project estimate DAVIS submitted to Douglas Development in bidding for this project. The original contract value between DAVIS and Douglas has fluctuated as additional costs have been incurred. It is worth mentioning even just briefly that since the project began there have been a couple of major changes that have driven up the project cost. Those will be discussed in technical reports two and three to come later, but at this point, the source of cost data discussed in this report is dated May of 2005 and was established during the early budgeting stages of the project.

Construction Costs

The significant aspect of this project that separates it from most new commercial construction is the historical renovation and restoration performed on the four surrounding buildings. In terms of construction costs, this report will make a small distinction between the office tower and each of the renovated buildings excluding all real-estate pricing, sitework, or permits. The full project scope consists of 228,162SF for the office tower, 12,662SF for the BW renovation, 6,471SF for the BW annex, 4,935SF for the Corcoran renovation, 32,296SF for the Nordlinger renovation, and 76, 075SF for the parking garage. These floor areas are accounted for in gross square feet and total 360,601; whereas the amount of rentable square footage is only 249,100. The following values are the cost estimates for each of the previous structures: Tower - $22,230,410; BW - $1,383,177; BW Annex - $737,547; Corcoran - $1,153,095; Nordlinger - $4,197,361; and Garage - $5,966,174. The actual building Construction Costs total $35,667,764 resulting in the gross square footage cost of $98.91 and the rentable square footage cost of $143.19.

Total Project Costs

The sitework for this project totaled to $4,743,296, including the significant dewatering plan and demolition of an existing two-story building. Through conversations, it became evident that the total amount paid for the real-estate wouldn't be disclosed and will be ultimately ignored in this report. Therefore, the calculation of Total project Cost (TC) consists of the direct Construction Costs, general conditions, general conditions fee, an estimating contingency, an historical preservation contingency, and CGL insurance. Information regarding the builder's risk insurance as well as payment and performance bonds is excluded from the source estimate and therefore will be ignored in this calculation.

The following values are the cost estimates for the items listed above: Construction Cost - $35,667,764; Sitework - $4,743,296; General Conditions - $2,604,000; General Conditions 4.0% Fee – $1,720,602; Estimating 2.5% Contingency – $970,442; Historic Preservation 15.0% Contingency – 1,120,677; and CGL Insurance at 0.4% - $187,307. The Total project Cost (TC) is $47,014,089 increasing the gross square footage cost to $130.38 and the rentable square footage cost to $188.74.

Building Systems Costs

Structural System – The structural systems in this project consist of a combination of cast-in-place concrete, post-tensioned slabs, and steel beams with metal deck. For the sake of this section, the costs will be accounted for based on their location not their material. Therefore, the following values are the cost estimates for the structural systems in the: Garage - $4,242,504; Nordlinger - $66,393; Corcoran - $13,225; BW Annex – $78,150; BW – $112,000; and Tower – $3,817,075. The structural system cost is $8,329,347 making a gross square footage cost of $32.10 and the rentable square footage cost to $33.44.

Mechanical System – The mechanical system cost comes from the individual plumbing and mechanical costs of each building similar to how the structural cost was calculated above. Additionally, the HVAC cost estimate is included. The following values are the cost estimates

for the mechanical systems in the: Garage - $490,224; Nordlinger - $555,958; Corcoran - $92,661; BW Annex – $118,389; BW – $224,089; Tower MEP – $786,650, and Tower HVAC – 2,984,890. The mechanical system cost is $5,252,861 making a gross square footage cost of $15.57 and the rentable square footage cost to $21.09.

Electrical System – The electrical system cost comes from the individual lighting and electrical costs of each building. The following values are the cost estimates for the lighting and electrical systems in the: Building Exterior - $81,000; Garage - $185,857; Nordlinger - $258,368; Corcoran - $39,480; BW Annex – $51,768; BW – $101,296; Tower – $1,976,225. The lighting and electrical system cost is $2,693,994 making a gross square footage cost of $7.47 and the rentable square footage cost to $10.81.

Elevators –The following values are the cost estimates for the planned elevators in the project: Garage - $320,000; and Tower – $1,620,000. The total system cost is $1,940,000 making a gross square footage cost of $5.38 and the rentable square footage cost to $7.79.

Additional Systems – The HVAC system designed for the office tower totals $2,984,890 making a gross square footage cost of $8.28 and the rentable square footage cost to $11.98. The signature appointed spaces designed by the firm of Pei Cobb Freed were implemented to attract the most successful companies to Square 320. Their design energy focused on the executive restroom, highly appointed lobby and atrium spaces, and the health club common area. In all, these finishes total $1,740,167 making a gross square footage cost of $4.83 and the rentable square footage cost to $6.99.

Parametric Estimate

Included below is the parametric estimate for the Square 320 project. Using D4Cost 2002, this estimate is the average of five building cost reports chosen by their relative similarity to the Square 320 project. Those five buildings include the Rio San Diego Plaza, West Chase Corporate Center, Ha-Lo Headquarters, Willow Oaks II, and Tenth Street Place. In order to find the best match, the focus was put on 4 basic building attributes: building purpose, square footage, number of floors, and structural system. The Rio San Diego Plaza is a two building, 6-story, 190,000 SF concrete office complex. Tenth Street Place is a 7-story, 250,000SF structural steel office tower with an underground 5-story parking garage. Willow Oaks II is a 7-story, 188,000SF post-tensioned CIP concrete class-A office tower with a 5-story parking garage. Ha-Lo Headquarters is a 7-story, 200,000SF structural steel office tower with 2-stores of executive luxury offices. West Chase Corporate Center is a 6-story, 190,000SF structural steel class-A office tower with an 2-story parking garage.

Although none of the above selections include historic renovation and restoration, all five have very strong similarities as can be seen in the common attributes like a parking garage, multi-level office space, and a considerable amount of square footage. The total building cost estimate, most likely accounting solely for Construction Costs (CC), from D4Cost2002 came to a total of $38,357,496 where the average cost per gross square foot equals $115.98.

Square Foot Estimate

The RSMeans square foot estimate reference book only focuses on new construction and does not include any square footage data sheets for renovation or restoration work. Therefore in order to account for the work done in the existing buildings two square footage estimates were conducted using the M.480 “11-20 story office space” data sheet to account for the tower and the M.460 “2-4 story office” data sheet to account for the renovations. Then by combining the two individual estimate values we have a single estimate for the full scope of work through the Square 320 project. Based on how RSMeans calculates its square footage cost values, it is expected that the estimate will overshoot the actual project cost considerably.

Assumptions

M.480 – In order to account for the square footage from the garage, all 76,075 SF were assumed to be basement. The tower elevators are listed as 2 traction 12 and 3 traction 13-stop

passenger elevators and one traction 14-stop freight elevator. However, they are not listed by capacity so it was assumed that the traction 12 elevators were equivalent to the 4000# capacity elevators and that the traction 13 elevators were equivalent to the 4000# capacity elevators. Time multiplier was assumed to be 1.08 and location to be 1.07 for both estimates.

M.460 – The first assumption was that the total square footage from all the renovation buildings was a single new office space construction. Additionally, despite the below grade rentable space, the renovation estimate assumed that there is no basement in any of the buildings. The terracotta flooring, supported by wooden beams, is the base of the loaded bearing brick but an assumption was made that the actual construction method was only face brick with concrete block back-up supported by a structural steel joist system. After reviewing the common additives section of M.460, it was determined that none should be added to the estimate; they did not share enough commonalities for inclusion.

Total Estimate

After both individual estimates were finalized and then combined together, the total square foot estimate based on RSMeans came out to be $63,873,300.

Discussion

The Construction Costs totaled $35,667,764 but the Total project Cost reached as high as $47,014,089. Those two values are the most accurate estimates of the Square 320 project at this point in the construction process. D4Cost2002 came to a total of $38,357,496 which is much closer to both the CC and TC than originally expected. Perhaps this is due to the proper selection of similar buildings from which to compare. It is more likely that D4Cost2002 has much more comprehensive estimation data in each job budget and therefore can provide a more accurate snapshot.

Knowing that RSMeans includes the general conditions and all of the 1 time only costs associated with construction, it makes sense that the RSMeans estimates, since two were added together, would be considerably more than the other estimates. After each of the estimates, there is reason to believe that something is missing from DAVIS' detailed estimate. The Project Executive at DAVIS mentioned a building price-tag at $60M but the project budget was nearly 25% less than discussed. After further investigation in the coming weeks, specifically in regards to more detailed cost and assemblies estimating, the estimate values should be in better agreement each time we take the estimating one level deeper.

Site Plan of Existing Conditions

(please see drawing C.01 in the appendix)

Local Conditions

The District of Columbia is known for the restrictions placed on the height of all buildings. With the restriction in place, Square 320 was designed to get maximum rentable space by minimizing plenum space and moving towards a cast-in-place concrete design. At specific locations within the tower post-tensioned beams were included to reach the desirable span length without the need of further supports.

The project encompasses the historical renovation of 4 previous buildings on the 11th Street side of the block, the Nordlinger, Corcoran, and the B&W Building and Annex. Great effort was made to ensure the restoration of these buildings to their original condition. Each of the historical buildings had significant abatement and remediation that needed to be accomplished before the renovation could commence but designers wanted to keep the existing structural system intact. The buildings utilized a system of terracotta flooring that used the addition of concrete to create a load bearing floor structure. Due to the age of the buildings however the floor structure needed to be supported and was down so with the use of structural steel, metal

deck, and concrete fill. In addition to renovating the buildings, the owner wanted to create additional rentable space by jacking up the entire B&W building 3 feet, excavating it further out under the sidewalk, and then extending the footprint underground and finishing it was basement space.

When boring samples were taken, Engineering Consulting Services Ltd discovered the majority of soil to be comprised of low plasticity clays (lean clay with sand) with significant moisture. Throughout the DC area the water table varies but can be as high as 10 feet below sea level. Upon further investigation of the site, the water head was discovered to be at 41 feet of depth. Before the excavation would be allowed to move forward an extensive dewatering plan had to be created to account for heavy water infiltration into the sight. The dewatering plan consisted of 6 well points along the perimeter of the site continuously discharging water directly into the storm sewers in excess of 30,000 GPM. The water was not contaminated therefore there was no official requirement for filtering the pumped water but the plan dictated a basic gravel filtering system would remove larger particles. The system was monitored frequently from piezometers on the west and south of the site. Once the system was in place and operational site excavation could begin as long as the well water was pumped 24 hours a day in excess of 30,000gal/min

Throughout the project, proper site management will be crucial seeing as space is the limiting factor. At this point, the Square 320 project has encountered normal waste management conditions that one might expect for commercial construction. At the early stages of construction, dumpster pickups came once every two weeks, and increased in frequency to once a week once the cast-in-place concrete was underway. Finally as expected, with dry-wall and interior finishes going commencing, dumpster tippings are expected to occur 2 to 3 times a week.

The Square 320 project is not seeking a LEED certification therefore does not have a need for various sorting dumpsters for recycling. Furthermore, if there was a need for recycling, it would be worth employing the services of an off-site sorting service that would pick-up the discarded materials and sort them later.

Since the construction site was very limited in space there was absolutely no parking allowed on site. All of the parking was off-site and contractors as well as a Davis' project managers were responsible for finding their own parking. The majority of people used public transportation to get to the site. In fact, having a DC Metro station within a few blocks provided all of the field workers, contractors, and executives with a reliable source of transportation. This bodes well for the convenience of the metro once this project is completed, it is very likely that the majority of tenants will take advantage of the metro system.

Client Information

Douglas Development is a long standing client of DAVIS with many years of work in the District of Columbia. Throughout the many years of working together the relationship shared between Douglas Development and Davis has been nothing but professional. Despite the fact that each project has varied and had its small details and stresses, both Douglas Development and Davis have always displayed the utmost respect and appreciation for each other and what they have accomplished together.

Douglas Development selected the site of 1199 F Street NW as part of a much larger plan to expand the central business district of DC and rejuvenate the East End. Many years ago, the East End housed high-end businesses, cosmopolitan shopping, and comfortable living options but in recent years the area has weakened. Douglas saw this market opportunity and has been involved with multiple projects, residential and commercial, working to revitalize the area and return it to its earlier status. Douglas did not receive any financial support from the local government in terms of tax-breaks or incentives; they are simply making a move on an area of the DC market that they believe will become financially lucrative.

Douglas first approached Davis with a soft budget that Davis had to work from in order to ensure they properly delivered the project within the means of Douglas. Throughout the

process there was a significant Value Engineering strategy in place to avoid excessive spending and keep this project at or below Douglas' budget. Despite the volatility of the current economic climate, construction of Square 320 was not affected by anything more than slight cost fluctuations with the fluid cost of supplies.

Douglas has been most concerned with the timely move-in of the tenants into the office space. Their desire has always been to offer very high-end and luxurious office space for Washington's growing companies and to have them settle in as soon as possible. In order to attract the upper echelon of companies, Douglas' main focus of the project was the proper execution of finishing the luxurious spaces. These finishes included granite stone top bathrooms with highly machined stainless steel partitions and front louvered wooden doors. And by far the most important finishes were that of the lobby where expensive stone was accented by highly stylized and appointed furniture. There haven't been any significant delays in the schedule thus far allowing for timely move-in of the tenants. At this stage in the project, Square 320 has acquired over 85% of tenants and expects to reach 100% before construction has completed. Before construction is completed, tenants can being subcontracting their fit-ins and work can begin. However, Davis must apply for and receive a CFO before Douglas is eligible to apply for one. At that point upon, receiving the CFO, tenants will be legally allowed to move in.

Project Delivery System

The Square 320 project has a fair share of interesting business relationships based on the existing professional relationships between Douglas, Davis, and the design teams. While there are no joint ventures involved with this project, it is worth mentioning that the technical owner of the project is listed as Jema's Square 320, a limited liability company. While little information is known as to who or what makes up the LLC, it is evident that the role of the owner in the construction management sense of the word is played by Douglas Development Corporation.

The delivery system used in the Square 320 project most resembles a traditional Design-Bid-Build project. This is based in the fact that Douglas had a plan for what they wanted in the design of the project, sent that out to the architect for design, and then upon completion of the design then pursued builder options. As discussed above, due to the close relationship between Douglas and Davis there was no formal bid process. Instead, once the design had been significantly completed, the two entities met together to discuss the scale of the project, expectations of the budget, cost estimates, and any additional financial constraints. Eventually, Douglas and Davis arrived at an agreement with a Guaranteed Maximum Price contract.

This project is very different than most in that it required the services of three distinct design firms to complete the architectural designs for the full scope of the project. The signature architect on the project was the firm of Pei Cobb Freed & Partners. Their greatest responsibility lied in the design of the high-profile aspects of the building. In order to satisfy the desires of the owner, Pei Cobb Freed designed the very luxurious spaces of the office tower including the highly appointed lobby and executive restrooms. But by far the most significant role of the firm was the design of the tower's skin and custom curtain wall. The firm of Pei Cobb Freed supplied the name recognition and upper class status that Douglas Development desired from this project. The second architectural firm was that of HKS, P.C. of Washington, DC. They acted as the architect of record and presided over the complete design of the new construction rather than just select building elements. They were inevitably responsible for the integration of work between the different architectural firms throughout the project, significantly supported by their local office. Finally, the architectural firm of Shalomes Baranes Associates was responsible for the restoration and renovation of the buildings on the project. A local firm with extensive historical renovation experience, Shalomes Baranes ensured that the abatement, restoration, and renovation of the Nordlinger, Corcoran, and the B&W Building and Annex were precise and entirely accurate to the buildings' historical state when it was first built. Having three different architectural firms on one project only blurred the lines of responsibility and added to the stress of

the project over time. Especially in terms of RFIs where one firm would be approached with the inquiry but would deny responsibility for it and pass it off to the other firm. Each of the firms played a role in the "run-around" game sending Davis back and forth between firms before eventually getting the necessary response.

Through conversations, it became evident that the specifics of the contractual agreements between the design teams and the owner would not be made available. Rather the assumption will be made that the contractual agreements between Davis and the owner mirror those between Douglas and the various design teams. These firms include Wiles Mensch Corporation for civil consulting, Tadjer-Cohen-Edelson Associates for structural design, Girard Engineering for MEP design, and Cosentini Lighting for lighting design.

Davis's role in the construction of Square 320 resembles more the role that a general contractor would play rather than solely a construction manager. Davis was selected by Douglas to act as the overall facilitator for the construction on the project and hold the risk associated with it. With the exception of smaller scopes of work, Davis holds the contracts with the subcontractors and responsibility of their work. The owner has held certain contracts throughout the project such as the paint abatement, aspects of site dewatering, selective demolition, and hazmat removal from the site. In addition, the owner is responsible for the Builder's Risk Insurance. Prior to construction beginning, Douglas met with Davis and came to the joint decision that every subcontract over $200,000 was required to be fully bonded through 100% performance and payment bonds. With the design of the project complete and the scope and schedule of the work sufficiently defined, Davis implemented Lump Sum contracts between all of its specialty and sub contractors. While many of the subcontractors were repeat associates of Davis over the years, Square 320 was public job that went out for bid and Davis worked to narrow it down to three bids per trade. Then Davis met to evaluate each bid and select the desired contractor.

Staffing Plan

Since 1990, DAVIS has been led by three primary leaders, Jim Davis, Dennis Cotter, and Bill Moyer. Their guidance, dedication, and fortitude are proven in the industry and have grown DAVIS into becoming one of the top general contractors in the Washington, DC Metropolitan area. For the Square 320 Project, Jim Davis is designated as the Principle-in-Charge and he carries the ultimate responsibility for the success of the venture. Under current Sr. Vice President Jim Dugan, this project is continually evaluated to ensure that the highest standards of prior planning, value engineering, and project performance are maintained. The Project Executive Keith Foote is my main point of contact with DAVIS and he is considered overall responsible for the project at the working level. This means, that his time is split overseeing the entire process of this project from the earliest days of preconstruction planning to the final days of verifying that the buildings are ready for closing and turnover to Douglas. Mr. Foote spends the majority of his time in the main office off-site but frequently attends progress meetings, visits the site, and assists in the likes of scheduling and procurement.

From here, DAVIS' basic chain of command splits into two parallel chains with one highlighting on-site relationships and the other covering the off-site ones. Off-site Sr. Project Manager Phil Goth leads the long scope planning and execution of the project by achieving pre-set goals through open and frequent communication to the field. It is his major responsibility to ensure strong cohesion in the project team. From there leadership is passed down to two Project Managers that are mostly responsible for the medium range planning, purchasing, and further execution of the schedule. Then responsibility falls on the two on-site Assistant Project Managers who establish and maintain the short range project goals by updating project logs, managing meeting minutes, and ultimately verifying DAVIS' completion and punch list.

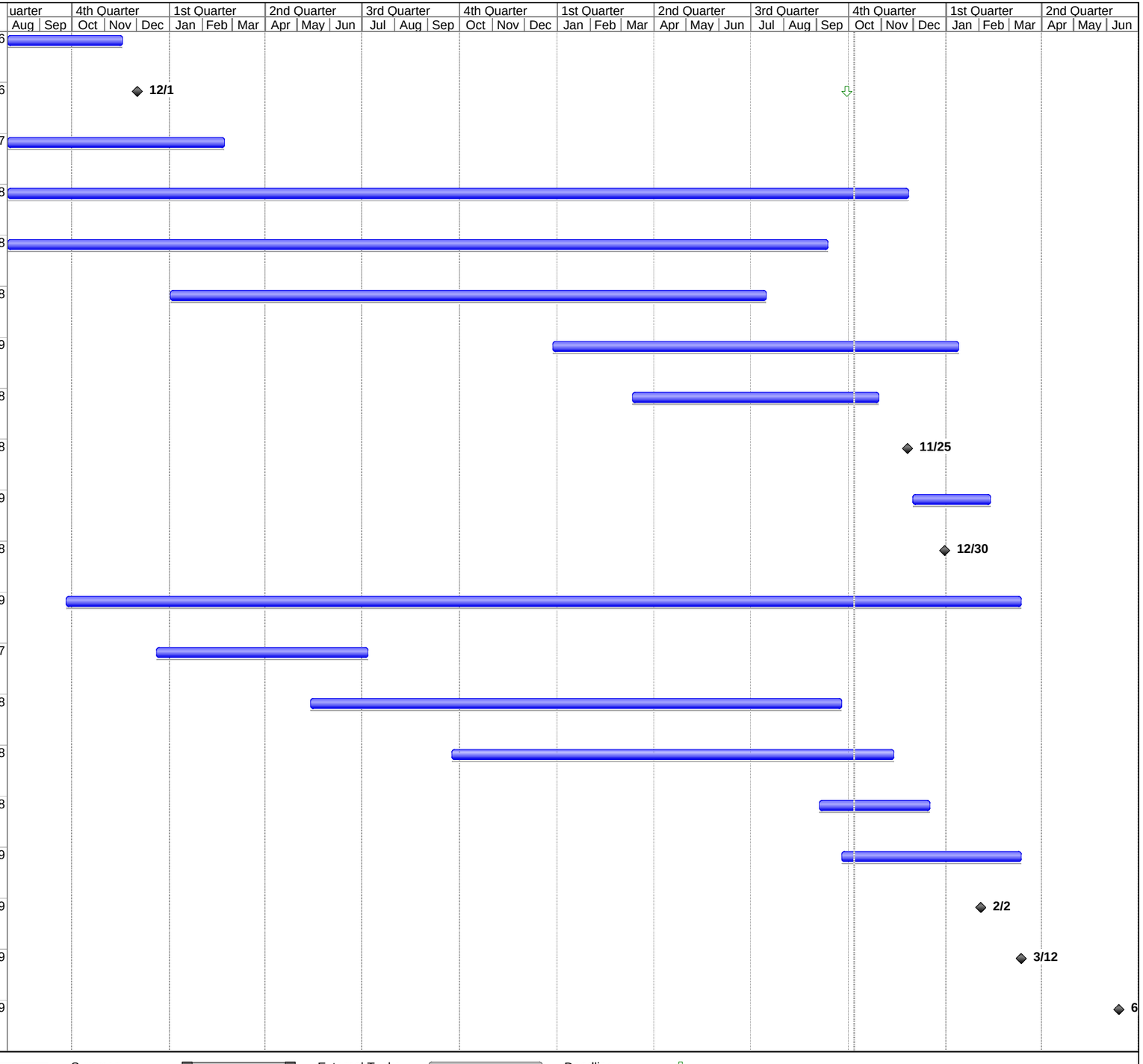
On the other parallel branch, Director of Safety Mike McCaffrey, ensures that the number priority of safety remains paramount in the eyes of every individual ever to step on the site. That

responsibility is passed down to the Senior Superintendant, additional Superintendants, and Assistant Superintendent who maintain on-site safety and project efficiency through various meetings, reports, reviews, and quality control. On-site, the buck stops with the team of superintendants who encourage and verify that the jobs are done promptly and correctly.

Conclusion

This report did lead to the discovery that fact excavation plans were altered slightly in the renovation of the historic buildings. In fact, each building was jacked up an additional 4 feet to create additional rentable and taking advantage of the vaulted space under sidewalks that used to be reserved for utilities infrastructure. In the upcoming thesis reports, more emphasis will be put on trying to discover how this adversely affected the cost and schedule of the Square 320 project. It appears to have provided very little benefit at an exorbanenet cost to the owner and it would be fascinating to understand more about the decisions making process to go forward with that design decision.

ID	Task Name	Duration	Start	Finish
1	Design Documents	78 days?	Wed 8/2/06	Fri 11/17/06
2	Owner: Full Notice to Proceed	0 days	Fri 12/1/06	Fri 12/1/06
3	Site Demolition	146 days?	Wed 8/2/06	Wed 2/21/07
4	Procurement	606 days?	Wed 8/2/06	Wed 11/26/08
5	Tower - Sitework	552 days?	Wed 8/2/06	Thu 9/11/08
6	Tower - Below Grade Structure	401 days?	Tue 1/2/07	Tue 7/15/08
7	Tower - Rough-ins / Interior Framing	272 days?	Fri 12/28/07	Mon 1/12/09
8	Tower - Above Grade Structure	166 days?	Wed 3/12/08	Wed 10/29/08
9	Tower - Enclosure	0 days	Tue 11/25/08	Tue 11/25/08
10	Tower - Interior Finishes	53 days?	Mon 12/1/08	Wed 2/11/09
11	Tower - Tenant Improvements	0 days	Tue 12/30/08	Tue 12/30/08
12	Renovation - Historical Buildings	643 days?	Tue 9/26/06	Thu 3/12/09
13	Renovation - Sitework	143 days?	Wed 12/20/06	Fri 7/6/07
14	Renovation - Below Grade Structure	358 days?	Mon 5/14/07	Wed 9/24/08
15	Renovation - Above Grade Structure	298 days?	Mon 9/24/07	Wed 11/12/08
16	Renovation - Rough-ins / Interior Framing	74 days?	Thu 9/4/08	Tue 12/16/08
17	Renovation - Interior Finishes	121 days?	Thu 9/25/08	Thu 3/12/09
18	Renovation - Enclosure	0 days	Mon 2/2/09	Mon 2/2/09
19	Substantial Completion	0 days	Thu 3/12/09	Thu 3/12/09
20	Final Completion	0 days	Fri 6/12/09	Fri 6/12/09



Project: A-Project Summary Schedule
Date: Mon 10/6/08

Task — Progress — Summary — External Tasks — Deadline
Split — Milestone — Project Summary — External Milestone

1199 F Street - Square 320 - Renovation

Square Foot Building Estimate

RS Means Source: Year:	**2008**	Model #	**M.460**
Page(s)	**176-177**	Ext. Wall Type	**Face Brick w/ Concrete Block**
Area	**56364**		
Perimeter:	**360**	Frame	**Steel Joists**
		Story Height	**10**

The Area fall between:	**50000**	and	**65000**
		Base Cost per Square Foot:	**$113.29**

Cost Adjustment Type:	**Perimeter Addjustment**	Per SF Adj.	**-$5.08**
Cost Adjustment Type:	**Story Height Adjustment**	Per SF Adj.	**$0.00**
		Adjusted Base cost Per Square Foot:	**$108.22**

Base Building Cost:	**$108.22**	x	**56364**	=	**$6,099,466.33**
Basement Cost:	**$33.50**	x	**0**	=	**$0.00**
				Total Cost:	**$6,099,466.33**

RS Means Additions"

Additions	**none**	Amount:	**$0.00**
		Total Cost:	**$6,099,466.33**

Multiplier Type:	**Location (Washington, DC)**	Value:	**1.07**
Multiplier Type:	**Time (.04+.04 Aprox.)**	Value:	**1.08**

Allowances:			
Addition:	**none**	Amount:	

Total Square Foot Estimate for Building:	**$7,048,543.29**

Assembly	% of Total	Cost per SF	Total Cost
A Substructure	4.7%	$5.88	$331,281.53
B. Shell			
B10 Superstructure	11.4%	$14.26	$803,533.94
B20 Exterior Enclosure	17.4%	$21.76	$1,226,446.53
B30 Roofing	1.7%	$2.13	$119,825.24
C. Interiors	22.5%	$28.14	$1,585,922.24
D. Services			
D10 Conveying	8.3%	$10.38	$585,029.09
D20 Plumbing	2.1%	$2.63	$148,019.41
D30 HVAC	14.0%	$17.51	$986,796.06
D40 Fire Protection	0.8%	$1.00	$56,388.35
D50 Electrical	17.1%	$21.38	$1,205,300.90
E. Equipment & Furnishings	0.0%	$0.00	$0.00
F Special Construction	0.0%	$0.00	*$0.00*
G. Building Sitework	0.0%	$0.00	*$0.00*
Additions			
Jobsite OH & GC's	22 (Time (# months))	$0.00 (Monthly Cost)	$0.00
Subtotal		* covered in Tower estimate	$7,048,543.29
Contractors Fee		25%	$1,762,135.82
Designer's Fee		7%	$493,398.03
		Total Cost of Building	**$9,304,100**

1199 F Street - Square 320 - Tower

Square Foot Building Estimate

RS Means Source: Year:	**2008**	Model #	**M.480**
Page(s)	**180-181**	Ext. Wall Type	**Dbl Glazed Heat Absorbing**
Area	**228162**		**Tinted Plate Glass Panels**
Perimeter:	**417**	Frame	**Cast-In-Place Concrete**
		Story Height	**12**

The Area fall between:	**200000**	and	**230000**
		Base Cost per Square Foot:	**$130.50**

Cost Adjustment Type:	**Perimeter Addjustment**	Per SF Adj.	**-$3.63**
Cost Adjustment Type:	**Story Height Adjustment**	Per SF Adj.	**$3.80**
		Adjusted Base cost Per Square Foot:	**$130.67**

Base Building Cost:	**$130.67**	x	**228162**	=	**$29,814,326.43**
Basement Cost:	**$33.50**	x	**76,075**	=	**$2,548,512.50**
				Total Cost:	**$32,362,838.93**

RS Means Additions"

Additions	**Elevator, Electric passenger, 4000# capacity (x3)**	Amount:	**$843,000.00**
Additions	**Elevator, Electric passenger, 3000# capacity (x2)**	Amount:	**$557,000.00**
		Total Cost:	**$33,762,838.93**

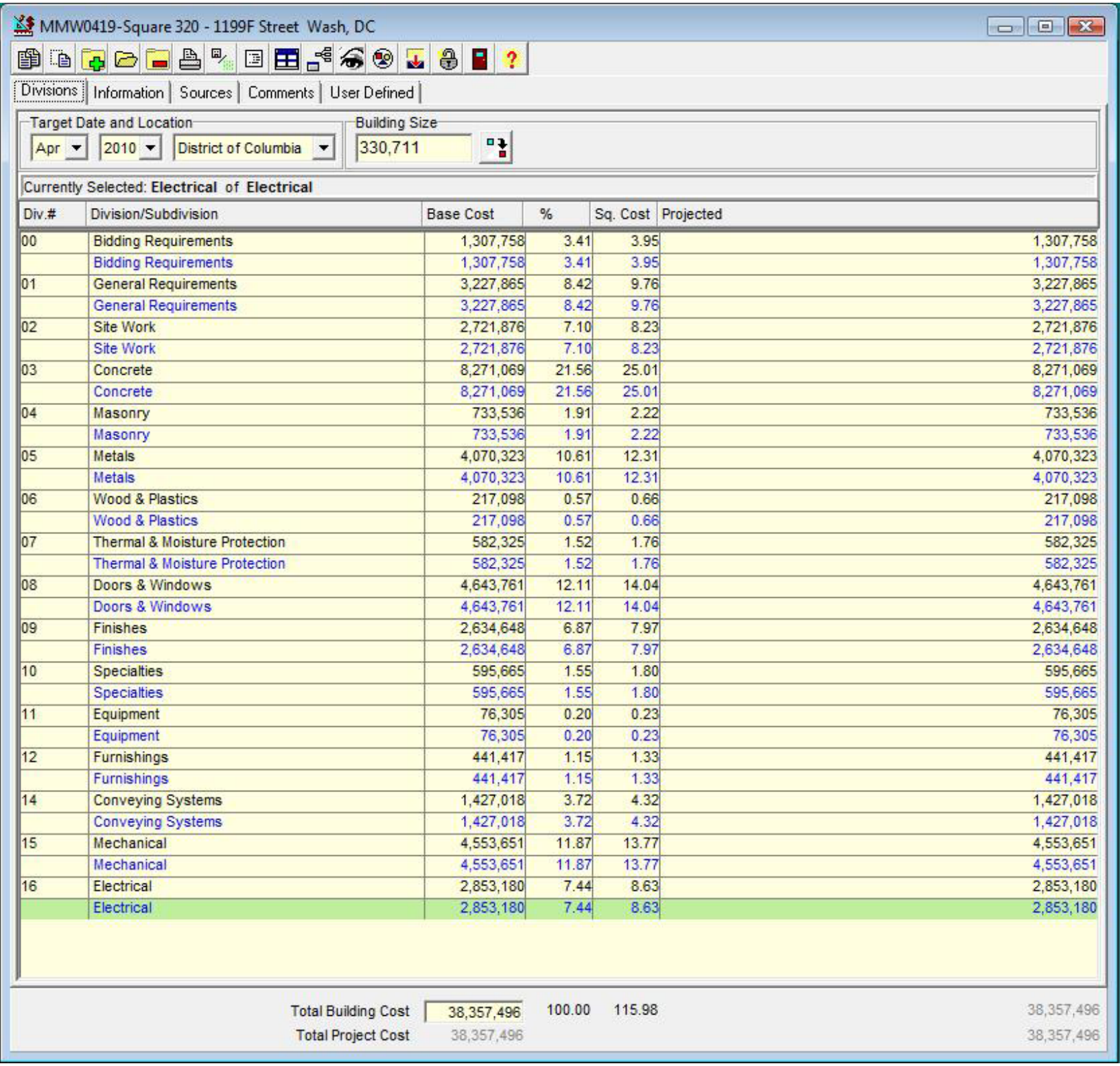
Multiplier Type:	**Location (Washington, DC)**	Value:	**1.07**
Multiplier Type:	**Time (.04+.04 Aprox.)**	Value:	**1.08**

Allowances:

Addition:	**none**	Amount:	
Addition:	**none**	Amount:	

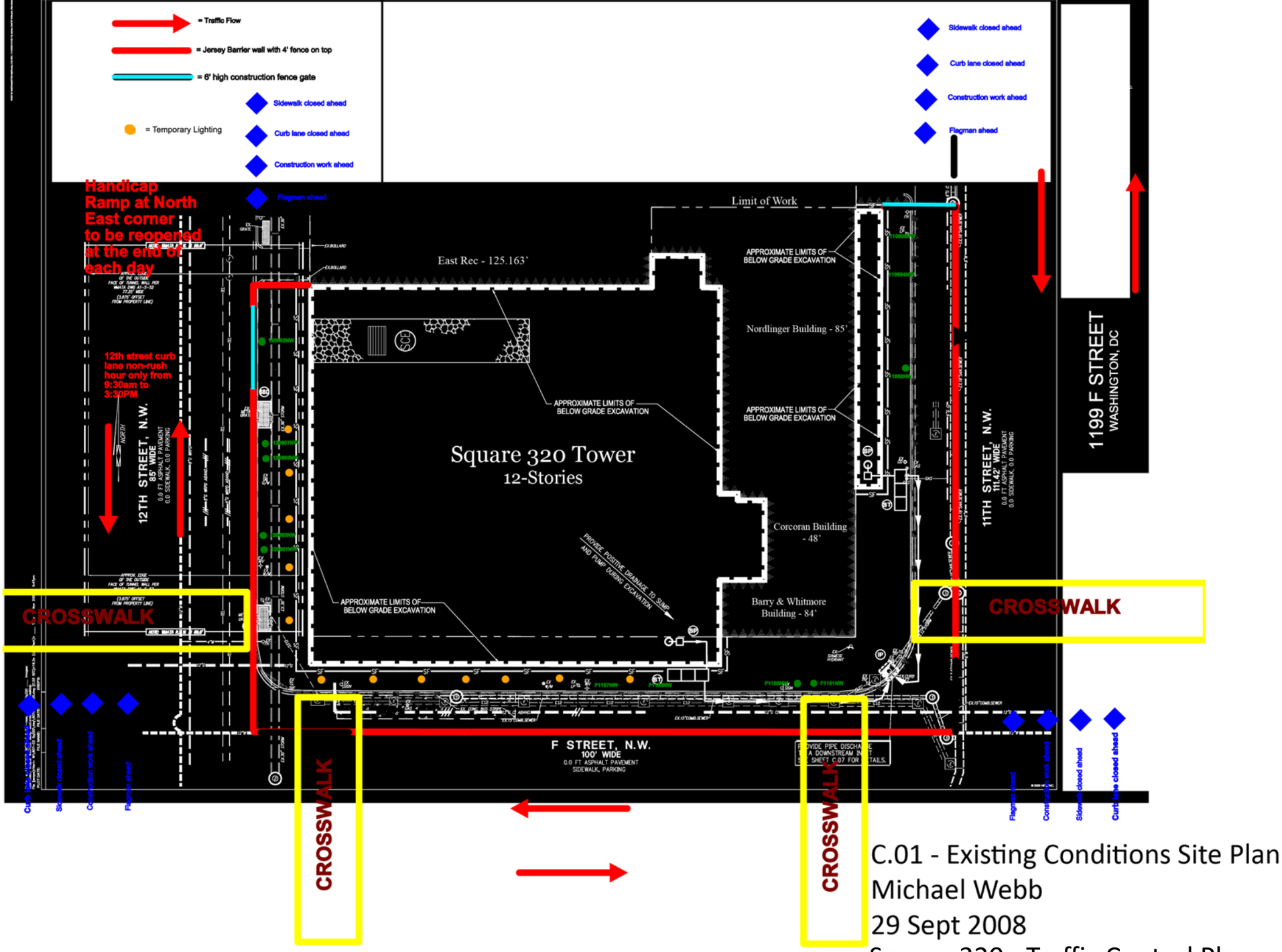
Total Square Foot Estimate for Building:	**$39,016,336.67**

Assembly	% of Total	Cost per SF	Total Cost
A Substructure	4.6%	$7.87	$1,794,751.49
B. Shell			
B10 Superstructure	23.5%	$40.19	$9,168,839.12
B20 Exterior Enclosure	12.8%	$21.89	$4,994,091.09
B30 Roofing	0.3%	$0.51	$117,049.01
C. Interiors	17.0%	$29.07	$6,632,777.23
D. Services			
D10 Conveying	4.7%	$8.04	$1,833,767.82
D20 Plumbing	1.3%	$2.22	$507,212.38
D30 HVAC	15.7%	$26.85	$6,125,564.86
D40 Fire Protection	4.1%	$7.01	$1,599,669.80
D50 Electrical	16.0%	$27.36	$6,242,613.87
E. Equipment & Furnishings	0.0%	$0.00	$0.00
F Special Construction	0.0%	$0.00	*$0.00*
G. Building Sitework	0.0%	$0.00	*$0.00*
Additions			
Jobsite OH & GC's	22 (Time (# months))	$119,980.00 (Monthly Cost)	$2,639,560.00
Subtotal			$41,655,896.67
Contractors Fee		25%	$10,413,974.17
Designer's Fee		6%	$2,499,353.80
		Total Cost of Building	**$54,569,200**



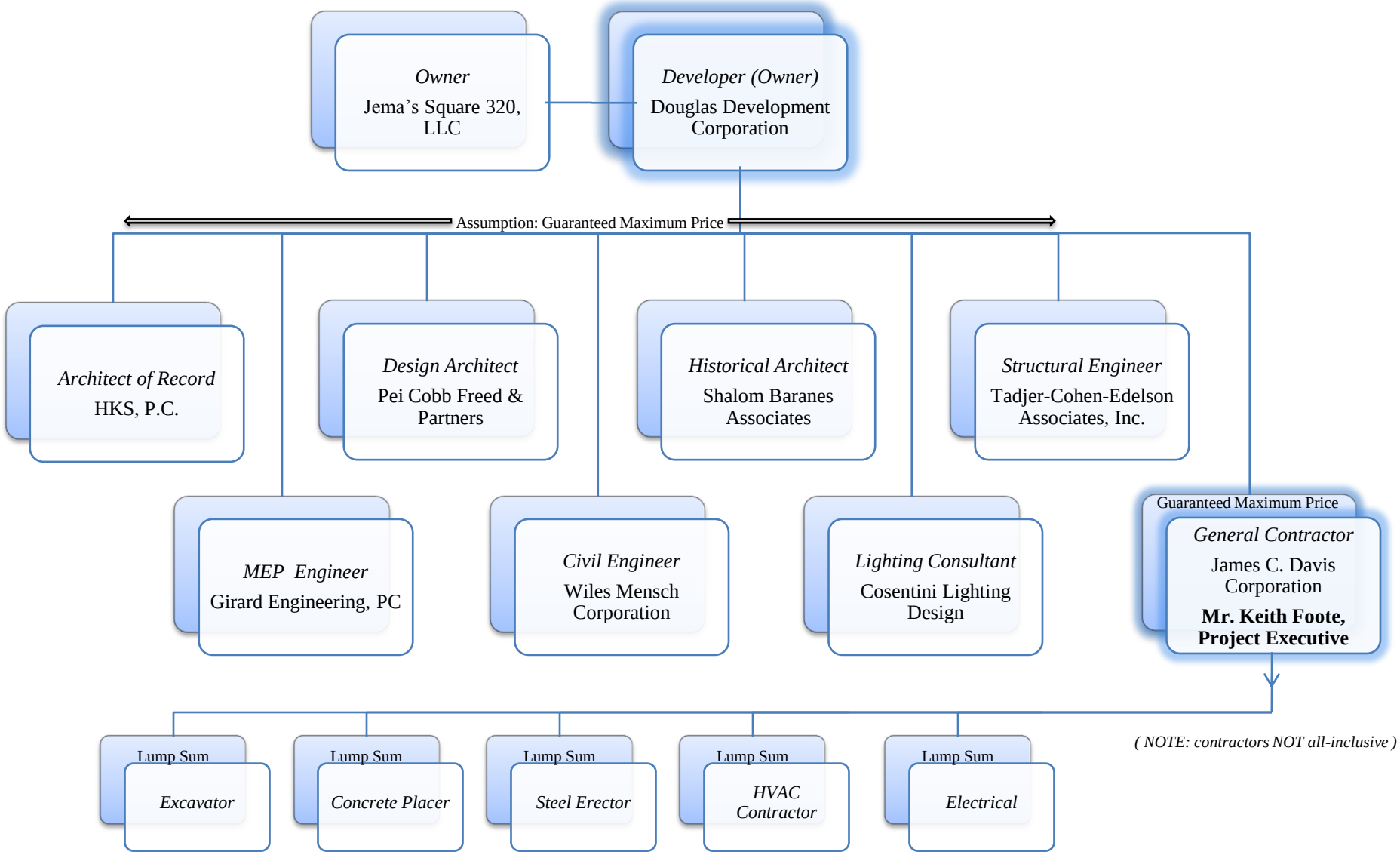
Div.#	Division/Subdivision	Base Cost	%	Sq. Cost	Projected
00	Bidding Requirements	1,307,758	3.41	3.95	1,307,758
	Bidding Requirements	1,307,758	3.41	3.95	1,307,758
01	General Requirements	3,227,865	8.42	9.76	3,227,865
	General Requirements	3,227,865	8.42	9.76	3,227,865
02	Site Work	2,721,876	7.10	8.23	2,721,876
	Site Work	2,721,876	7.10	8.23	2,721,876
03	Concrete	8,271,069	21.56	25.01	8,271,069
	Concrete	8,271,069	21.56	25.01	8,271,069
04	Masonry	733,536	1.91	2.22	733,536
	Masonry	733,536	1.91	2.22	733,536
05	Metals	4,070,323	10.61	12.31	4,070,323
	Metals	4,070,323	10.61	12.31	4,070,323
06	Wood & Plastics	217,098	0.57	0.66	217,098
	Wood & Plastics	217,098	0.57	0.66	217,098
07	Thermal & Moisture Protection	582,325	1.52	1.76	582,325
	Thermal & Moisture Protection	582,325	1.52	1.76	582,325
08	Doors & Windows	4,643,761	12.11	14.04	4,643,761
	Doors & Windows	4,643,761	12.11	14.04	4,643,761
09	Finishes	2,634,648	6.87	7.97	2,634,648
	Finishes	2,634,648	6.87	7.97	2,634,648
10	Specialties	595,665	1.55	1.80	595,665
	Specialties	595,665	1.55	1.80	595,665
11	Equipment	76,305	0.20	0.23	76,305
	Equipment	76,305	0.20	0.23	76,305
12	Furnishings	441,417	1.15	1.33	441,417
	Furnishings	441,417	1.15	1.33	441,417
14	Conveying Systems	1,427,018	3.72	4.32	1,427,018
	Conveying Systems	1,427,018	3.72	4.32	1,427,018
15	Mechanical	4,553,651	11.87	13.77	4,553,651
	Mechanical	4,553,651	11.87	13.77	4,553,651
16	Electrical	2,853,180	7.44	8.63	2,853,180
	Electrical	2,853,180	7.44	8.63	2,853,180

Total Building Cost	38,357,496	100.00	115.98	38,357,496
Total Project Cost	38,357,496			38,357,496



C.01 - Existing Conditions Site Plan
Michael Webb
29 Sept 2008
Square 320 - Traffic Control Plan

Square 320 Project – Organizational Chart



Square 320/1199 F Street

PRINCIPAL-IN-CHARGE
Jim Davis

Sr. VICE PRESIDENT
Jim Dugan
Overall Responsibility for Project Performance
Conceptual Project Planning
Conceptual Value Engineering

PROJECT EXECUTIVE
Keith Foote
Coordination of Preconstruction, Bidding and Construction, Attends Progress Meetings
Assist in Schedule, Procurement, and Closing

SENIOR PROJECT MANAGER
Phil Goth
100% Committed – Off-Site
Procurements and Cost Control
Maintains Open, Daily Communication with Field
Preparation of Detailed Project Const. Schedule
Fosters Teamwork Among all Involved Parties

PROJECT MANAGER
Fulya Kocak/Dean Moissakis
100% Committed – Off-Site
Procurements and Cost Control
Maintains Open, Daily Communication with Field
Preparation of Detailed Submittals, Cost Management
Fosters Teamwork Among all Involved Parties

ASSISTANT PROJECT MANAGER
Habeeb Abdullah/Burak Basogul
100% Committed – On-Site
Establish, Maintain and Update Project Logs
Write and Distribute Meeting Minutes
Manage DAVIS Completion and Punch List

DIRECTOR OF SAFETY
Mike McCaffrey
Project Safety Planning
Monthly Safety Inspections
Implement DAVIS safety program

SENIOR SUPERINTENDENT
Greg Clark
100% Committed – On-Site
Coordination of Field Operations
Job-site Safety and Field Reporting
Quality Control and Foreman Meetings
Review of Design Details for Construction

SUPERINTENDENT
Bill Myers/Fred Dandeneau
100% Committed – On-Site
Coordination of Field Operations
Job-site Safety and Field Reporting
Quality Control and Punch List
Review of Design Details for Construction

Assistant SUPERINTENDENT
Tyler Moyer
100% Committed – On-Site
Assist with Layout
Job-site Safety and Field Reporting
Quality Control and Punch List