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REVIEW

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by John Norwood



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Introduction

On October 21, 2004, developer Larry Silverstein joined Governor George Pataki and Mayor Michael Bloomberg in signing the final steel beam for 7 World Trade Center before 500 of the project's construction workers. The beam, wrapped in the same American flag that had been used less than two decades prior for the original building, was then hoisted over 700 feet and set into place atop the 52-storey structure¹. This topping off ceremony for 7 World Trade Center would carry a certain resonance with both New York City residents and the nation as the building was the last to collapse after the tragic September 11th terrorist attacks and the first to be rebuilt. However, 7 World Trade Center would also be significant in many other ways. It would be the first new office tower built in Lower Manhattan in twenty years, marking what Silverstein would describe as a "Downtown Renaissance"². It would be the first "green" office tower to be built in New York City, achieving gold status under LEED's Core and Shell certification requirements. It would also set a new standard for fire safety and structural efficiency. (The original building was the first recorded example of a tall building collapsing largely due to uncontrolled fires³.)

Housing not only 42 stories of office space, but also a ten-story Consolidated Edison electrical substation, 7 World Trade Center made use of both creativity and cutting edge technology to satisfy a number of complicated aesthetic, structural, and functional design criteria. In many ways, the development could be viewed as a paragon of the 21st century skyscraper. Design alone, however, represents only a fraction of what makes the \$700 million project remarkable⁴. Silverstein Properties' navigation of a long and complicated entitlement process involving stakeholders with seemingly incompatible visions and the leasing of the building within the context of an ailing Lower Manhattan office market make 7 World Trade Center truly unique (see Figure 1).

Figure 1: The New 7 World Trade Center Building. *Image Courtesy of David Shankbone*



¹ "Governor Pataki and Mayor Bloomberg..." Press Release on www.renewnyc.com

² "Darby & Darby..." (Press Release)

³ NIST

⁴ Kretkowski

Background

In May of 1980, Larry Silverstein of Silverstein Properties acquired the rights to lease and develop a keystone-shaped parcel adjacent to the World Trade Center site (bounded by West Broadway, Washington, Barclay, and Vesey Streets) in Lower Manhattan in what would be his first venture into ground-up construction (see Figure 2) ⁵. At the time, the site was occupied by a Consolidated Edison substation that was engineered to support a 25-storey structure of roughly 600,000 sf ⁶. Silverstein, however, decided to construct a 47-storey building based on a trapezoidal floorplan (using all available area within the irregularly-shaped parcel) for a total of roughly two million square feet of space. ⁷ In order to accommodate the excessive load, additional caissons were built in the foundation of the site and the structure's columns and girders were designed to redistribute the building's load to a narrower area than the floorplan. The building connected to the rest of the World Trade Center complex both underground and via two pedestrian bridges on the third floor.

Figure 2 - The Footprint of the Original 7 World Trade Center Building.

Image Courtesy of 911Research.com



The original 7 World Trade Center officially opened in March of 1987 in the midst of substantial leasing uncertainty. Several months prior, Mr. Silverstein negotiated an agreement for Drexel Burnham Lambert, an investment banking firm, to lease the entire building for 30 years, only to have the company back out after an insider trading scandal. As a result, the building would open completely vacant. Spicer and Oppenheim, an accounting firm, would move into the building shortly thereafter, but would only occupy 14% of the total area ⁸. It would be well over a year before Silverstein could find additional tenants, and only after rent reductions and concessions. Salomon Brothers agreed to lease the top 19 floors of 7 World Trade Center in late 1988 and would remain as the largest tenant for the life of the building. On July 24, 2001, Silverstein Properties won a bid for

⁵ Horsely

⁶ Salvarinas

⁷ McCain

⁸ Berg

the ground lease of the Twin Towers and buildings 4 and 5 of the World Trade Center with an offer valued at \$3.2 billion. The acquisition of the ten million square feet of space within the complex instantaneously made Larry Silverstein the biggest commercial landlord in New York City. The distinction proved to be quite short-lived, though, when terrorists flew airplanes into each of the Twin Towers in the 9/11 attacks, ultimately resulting in their collapse. Falling debris from the towers caused structural damage and sparked a series of fires within 7 World Trade Center. It would collapse later that evening.

The Aftermath

There was little doubt in the mind of Larry Silverstein that the World Trade Center needed to be rebuilt following the terrorist acts. The recently acquired Twin Towers, however, would be subject to an extensive planning process to both provide the city with a new icon and the nation with a 9/11 memorial. In contrast, 7 World Trade Center had been evacuated long before its collapse, preventing any loss of life, and was not part of the original 16-acre site of the World Trade Center complex. As a result, Silverstein quickly began designing a new 7 World Trade Center, and had produced models for the project by as early as January of 2002⁹.

It became clear that building the new structure, estimated to cost \$640 million at the time, would be no easy task. Lower Manhattan residents complained about how the original World Trade Center disrupted the street system and obstructed their views. The city of New York sought to control the redevelopment to meet its economic and memorial objectives. Con Edison sought to rebuild and own a new substation on-site, creating unique design constraints and difficulties in creating an ownership structure for the entire building. The lenders holding the mortgage for the property did not see redevelopment as feasible and called for immediate repayment of the outstanding balance. To further complicate matters, a fear of additional terrorist attacks along with tough competition from available space in Midtown and New Jersey pushed Lower Manhattan office vacancies well into the double digits¹⁰. It would take the persistence, creative thinking, and innovative vision of Silverstein Properties to get a financially feasible project off the ground.

Satisfying the Stakeholders

Rethinking the Superblock

The original World Trade Center was designed as a “superblock,” where the surrounding streets of the urban grid did not pass through the site. As a result, the streets would terminate at large buildings that would obstruct pedestrian views of the sky. Following 9/11, David Childs, the architect Silverstein hired to design the new tower, suggested that the street grid be reestablished in plans for redevelopment, calling specifically for the new 7 World Trade Center building not to obstruct Greenwich Street as the original building had. Such a concession required that the building lose over 15,000 square feet of space within its footprint (see Figure 3).

⁹ Bagli 1-31-02

¹⁰ Bagli 1-31-02

would not be until the ultimate completion of 7 World Trade Center that it would gain consistent visible support from the city.

Creating the Substation

Con Edison desired to rebuild and own a new \$100 million substation on the 7 World Trade Center site that would provide 80 megawatts of electric power for the building, Battery Park City, and the proposed new World Trade Center. The station, designed to convert high-voltage current from generating stations into a more manageable form, would require 168 tons of vertically stacked transformers that would occupy a total of seven stories. An additional three stories of mechanical equipment would be placed above them. This scenario created a set of unique design constraints for the building. Although bulky columns would be needed to support the weight of the transformers, it was necessary that the building maintain the aesthetics of a first class office building and accommodate an appropriately-sized lobby. Next, the skin of the building would need to allow air to flow freely around the transformers, as they generate a large amount of heat (see Figure 4) ¹⁴.

Figure 4 - The Permeable Skin Along the Lower Floors of 7 World Trade Center.

Image Courtesy of wirednewyork.com



To address these concerns, the lobby of 7 World Trade Center is situated between two major columns and has a 46 ft tall glass curtain wall that provides natural light. The columns, each five feet in diameter, are sheathed in reflective steel, giving them a lighter appearance. Facing the entrance to the lobby is a 14-by-60 foot art installation designed by artist Jenny Holzer. It is an LED screen that continuously scrolls words of notable poets and authors that are associated with New York. The display can be seen from the new park across the street (see Figure 5) ¹⁵.

¹⁴ Collins

¹⁵ Collins

Figure 5 - Jenny Holzer's Art Installation in the 7 World Trade Center Lobby.

Image Courtesy of sunrisesystems.com



Perhaps one of the most distinctive elements of the building, though, is the lighting system within the skin that surrounds the substation. The exterior wall, designed by James Carpenter Design Associates, is a stainless steel scrim that is porous and implanted with LEDs that glow in a variety of different colors throughout the day. In addition, cameras located around the exterior of the building can track the paths of pedestrians around the building and mark their movements with corresponding light patterns ¹⁶.

Aside from design considerations, Con Edison's ownership stake in 7 World Trade Center would create difficulties in divvying costs between it and Silverstein Properties during development. Simply charging Con Edison for the first ten stories proved to be inadequate and issues arose over which parts of the building's foundations and elevator shafts would be attributable to each party. Furthermore, Con Edison argued that the high-tech skin created for the building at Silverstein's request went far beyond what would generally be required for a substation. Eventually, a review of costs during the design process on a week-by-week basis was settled upon. Obtaining the Financing Even after the design of 7 World Trade Center was complete, financing the project continued to be quite difficult. By May of 2002, Industrial Risk Insurers (IRI), the insurance company for the original structure, decided not to contest Silverstein's claim of \$861 million. Issues arose, however, over how the sum would be paid and distributed between the parties involved ¹⁷. Silverstein insisted the insurance proceeds be paid in a lump sum, while IRI planned to make installments. Meanwhile, The Blackstone Group and Bank of America Securities, the mortgage holders on the original structure, disagreed with Silverstein Properties over the exact amount owed by as much as \$90 million ¹⁸.

Ultimately, the proceeds obtained through the insurance on the building were placed into a trust that was controlled by the lenders. As their only collateral for the mortgage (since the property remained undeveloped), the lenders sought to use the insurance money to immediately pay off the remaining balance (roughly \$489.4 million as of January 2003). Silverstein refused, however, and continued to draw from the insurance money to finance the construction of the new building while making monthly mortgage payments ¹⁹. This would set the stage for an ongoing conflict where the lenders resisted releasing funds for construction even after the submission of work orders and requisitions. Since the insurance money was issued on the condition that a new structure would be built within two years, though, the lenders were prohibited from blocking construction altogether ²⁰.

¹⁶ Collins

¹⁷ Bagli 5-8-02

¹⁸ Bagli 1-16-03

¹⁹ \$400 million of tax-free Liberty Bonds raised by the city was added to the insurance proceeds to fund the project.

²⁰ Bagli 1-16-03

A New Paradigm in Design

Silverstein viewed the rebuilding of 7 World Trade Center as “an extraordinary opportunity” to create a “spectacular... portal to the new World Trade Center,” and the building’s creative lobby and skin are a testament to this vision ²¹. Silverstein’s focus on excellence in design, however, would go beyond the aesthetics of the building to encompass cutting edge environmental and safety features.

Going “Green”

There has been an increasing level of awareness about “green” building in recent years due to the efforts of the US Green Building Council and its Leadership in Energy and Environmental Design (LEED) rating system. Up until recently, though, it was quite difficult for office towers to qualify. However, a Core and Shell certification system has been recently developed under LEED that establishes more practical criteria for office developers. The Core and Shell certification system focuses on green elements used in the construction and maintenance of the building, rather than the interior build out, which is subject to change with the tenants that occupy the space. It was under this new system that 7 World Trade Center earned LEED Gold certification, making it the first green office tower in New York City. Some of its green elements are listed below:

- Floor-to-ceiling low-iron glass on the office floors allows sunlight to reach 90 percent of the building’s interior, reducing the need for artificial light. The glass is also treated with a low-emissivity coating and sprayed-on ceramic frit to control the transmission of heat and certain ultraviolet frequencies.
- Rainwater is captured from the roof and used to cool the building and water the plants in the adjacent park. This reduces the building’s runoff by 25 percent.
- 7 World Trade Center is equipped with mini-turbines that slow down steam from the high pressured city lines while generating electricity in the process.
- A high level of air quality is maintained in the building through the use of a high-efficiency filtration system ^{22 23}.

Safety

In light of the September 11th attacks, it would be necessary for 7 World Trade Center to establish a new standard of excellence for safety precautions in office towers. The main areas of concern were protection against blast effects, fires, vent contamination, sudden structural failure, and the large fuel tanks that were needed on-site. It was imperative that each of these items be addressed in a structurally elegant way that would not be visually obstructive.

Blast Effects

7 World Trade Center was designed to reduce civilian casualties in the case of ground-level explosions such as a vehicular bomb. The first level of protection is that there are no occupied floors beneath the eleventh storey. Second, the Holzer installation in the lobby is designed to double as a blast shield. Third, the core of the building is composed of

²¹ Bagli 1-31-02

²² Kretkowski

²³ “7 World Trade Center...” Press Release by Tishman Construction

2-foot thick walls of reinforced concrete and contains two stairwells that are 110 feet apart, reducing the chance of simultaneous damage during an attack ²⁴.

Fire Protection

Given the role of fire in the collapse of the original 7 World Trade Center, it was critical that the new one implement more conservative fire safety design criteria. The fireproofing used in the building is seven times more adhesive than required by code and a state-of-the-art fire command center is located at the lobby's front desk. In the event that this command center is not available, a second command center is accessible via the building's loading dock. The fire stairwells in the building are 5.5 feet wide (20 percent wider than required by code) in order to allow firemen to safely pass workers exiting the building and stairwell landings are large enough to provide room for the handicapped to wait for assistance without blocking the exits. All fire stairs lead directly out of the building ²⁵.

Vent Contamination

The accessibility of 7 World Trade Center's ventilation system to outside contamination was also considered in its design. The main air intakes for the building are located 100 feet above grade (making them difficult to reach by outsiders) and are equipped with high-efficiency filters ²⁶.

Sudden Structural Failure

In the event that a building's structural integrity is compromised, a slow rate of failure is preferred over a rapid one, as it provides ample time for occupants to evacuate the premises. 7 World Trade Center uses several layers of structural redundancy in its design and employs moment-connected frames that keep local failures from causing global collapse. WSP Cantor Seinuk, the structural engineering firm for the project, made special efforts to see that the building's framing would be hidden from interfering with the exterior glass ^{27 28}.

Fuel Tanks

As part of its design, 7 World Trade Center needed to house a series of fuel tanks. These tanks were situated beneath the adjacent park so as not to be directly under the building.

The Market

The new 7 World Trade Center would find itself in quite a different market than its predecessor. Since the 9/11 attacks, Lower Manhattan had lost 20.3 million square feet of office space, both from the destruction of the World Trade Center and the conversion of 59 older office buildings into residential product ²⁹. Similarly, the population within

²⁴ Collins

²⁵ Kretkowski

²⁶ Kretkowski

²⁷ Kretkowski

²⁸ Collins

²⁹ Here "Lower Manhattan" is defined as everything south of Chambers St.

Lower Manhattan increased from 23,000 at the time of the attacks to 39,000 by early 2007. In many ways, this played into Silberstein's vision of a Downtown Renaissance, where the area, formerly known as a nine-to-five center for financial services, would become a 24/7 live-work community³⁰.

At \$41.36 per square foot, however, the average 2007 office rent in Lower Manhattan remained less than its average rent in 2000, \$43.24 per square foot. Office space in Midtown Manhattan, Lower Manhattan's main competitor, was at \$57 per square foot³¹. While Midtown offered greater accessibility to both local and regional transit than Lower Manhattan (being home to New York Penn Station, The Port Authority Bus Terminal, and Grand Central Station), a fair amount of its office stock was aging. 7 World Trade Center's state-of-the-art design proves to be one of its key differentiators. Even so, many considered the \$40 - \$80 per square foot rents requested by Silberstein (depending on the location within the building) to be an excessive premium.

Initially, Silberstein Properties looked to former tenants of the World Trade Center complex to fill the new building. Salomon Smith Barney, the original building's largest tenant, decided not return to 7 World Trade Center in May of 2002³². At the same time, Silberstein had been negotiating with the Port Authority (a former tenant of the Twin Towers) to lease almost 700,000 sf within the building. The Port Authority felt that it had a right to retain the \$22/sf rent that it paid for its previous space within the Twin Towers, but Silberstein insisted on a rent of \$42/sf. The two parties were not able to reconcile this difference.

In late September of 2004, Silberstein named CB Richard Ellis as the exclusive leasing agent for 7 World Trade Center, but the absorption of the building's spaces remained quite slow³³. The first tenant (apart from Silberstein Properties) was the New York Academy of Sciences, which signed a lease in December, 2005 for 40,000 square feet, or one floor. That was followed by publisher Mansueto Ventures signing a 15-year lease for 40,000 sf in July of 2006, and the intellectual property law firm Darby & Darby P.C. signing a 15-year 80,000 sf lease in August^{34 35}.

Despite these early leases, many people remained skeptical that the building would be successful. In August of 2006, Julie Satow, the real estate reporter of *Crain's New York Business*, stated that, "Larry [Silverstein] is nothing if not prone to hyperbole" and that only 10% of the building had signed leases for the \$50 to \$60 per square foot that Silberstein was asking³⁶. In the next month, however, Moody's Corporation signed a 20-year lease to occupy 15 floors of 7 World Trade Center (beginning on the 12th floor) totaling approximately 600,000 square feet. This lease was the largest to date at the World Trade Center and the largest lease transaction in Manhattan that year.

In the mean time, Silberstein capitalized on the 360-degree views of the vacant spaces, renting entire floors for \$25,000/day even though the spaces were never formally marketed as gala venues. The events held there include SoHo Synagogue's fundraiser and Calvin Klein's Fashion Week³⁷.

In December 2008, Silberstein signed a lease with West LB, a German bank, for the top three floors of the building. Rents were reported at \$80 a square foot, a record for the building and for Lower Manhattan. The company currently occupies 160,000 sf in a 40-year-old midtown building (1211 Sixth Ave) and expects that the availability of more column-free space in 7 World Trade Center will allow it to make the transition without

³⁰ Pristin

³¹ Pristin

³² Herman 5-31-02

³³ "Silverstein Properties Names..." Press Release by CB Richard Ellis

³⁴ "Mansueto Venture Signs..." Press Release by Mansueto Ventures

³⁵ "Darby & Darby .C. to ..." Press Release by Darby & Darby

³⁶ Spitz

³⁷ Birkner

scaling back staff. The \$150 million rent is 40% less than the company would pay to remain in Midtown³⁸.

At a press conference on the 52nd floor of the building, Mayor Bloomberg complimented Larry Silverstein for his vision and his persistence, saying “New York needs leaders like you.” At the time of this article, 7 World Trade Center only has 85,000 sf of unleased space remaining. Additional key points in the leasing process are described below:

- On January 4, 2006, Ameriprise Financial Inc signed a 10-year lease for 20,000 sf on the 39th floor of 7 World Trade Center and planned to move 50 employees in by mid-2006³⁹.
- Upon signing the 7 World Trade Center lease, the CEO of Mansueto remarked that this move by his company “symbolizes leadership, pride, and future prosperity of the City, reflects [the] company ethos to see beyond the box, and our vision of the long term contributions that Lower Manhattan will provide to New York City and the future growth of [the] company.” TPG architects will design the tenant space for Mansueto⁴⁰.
- A deal with Vantone Real Estate, a Beijing company that was looking to lease the building’s top floors, was initiated but ultimately fell through.
- In late 2006, Dutch Bank ABN AMRO signed a lease for 140,000 sf on floors 30 through 33 of 7 World Trade Center. However, after being acquired in 2007 by a European banking consortium, it sought to dispose of the space via sublease. West LB was originally interested in subletting ABN AMRO’s space, but eventually decided to acquire space higher in the building⁴¹.

An Unlikely Success

The story of 7 World Trade Center provides an example of how an innovative and financially successful development can progress in the midst of ambiguity, conflict, and challenging market conditions. Under the direction of Larry Silverstein, the project was able to navigate the unique political, structural, and financial considerations surrounding the redevelopment of the site to create an office tower that has raised the bar for creativity and environmental responsibility in modern skyscrapers. For Silverstein, though, 7 World Trade Center is only the starting point of his vision for Lower Manhattan, as he continues to promote excellence in design throughout the new World Trade Center complex.

Acknowledgements

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³⁸ Cuzzo

³⁹ “Ameriprise Financial to Lease...” Press Release by Ameriprise

⁴⁰ “Mansueto Venture Signs...” Press Release by Mansueto Ventures

⁴¹ Geiger

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