**Freedom Towers One World Trade Centers**

From Wikipedia, the free encyclopedia

Coordinates: 40°42′46.8″N 74°0′48.6″W﻿ / ﻿40.713°N 74.0135°W﻿ / 40.713; -74.0135



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| **One World Trade Center *Freedom Tower*** | |
| Computer rendering of One World Trade Center (with 7 WTC behind and to the right) | |
| **General information** | |
| **Location** | New York City |
| **Status** | Under Construction |
| **Groundbreaking** | April 27, 2006 |
| **Estimated completion** | April 2013 (Estimate) |
| **Opening** | 2013 |
| **Use** | Office, Observation, WTO |
| **Height** | |
| **Antenna or spire** | 1,776 ft (541.32 m) |
| **Roof** | 1,368 ft (417 m) |
| **Top floor** | 1,314 ft (401 m) |
| **Technical details** | |
| **Floor count** | 105 |
| **Floor area** | 2,599,980 sq ft (241,546 m2) |
| **Companies involved** | |
| **Architect(s)** | David Childs (Skidmore, Owings & Merrill) |
| **Structural engineer** | WSP Cantor Seinuk |
| **Developer** | Port Authority of New York and New Jersey |

*"Freedom Tower" redirects here. For other uses, see Freedom Tower (disambiguation).*

*For the building complex destroyed in the September 11 attacks, see World Trade Center. For the specific WTC building formerly known as One World Trade Center, see List of tenants in One World Trade Center.*

**One World Trade Center**, also known by its former name **Freedom Tower**, is the main building of the new World Trade Center complex in Lower Manhattan in New York City, New York. The tower will be located in the northwest corner of the 16-acre (65,000 m²) World Trade Center site bounded by Vesey, West, Washington and Fulton streets. Construction on below-ground utility relocations, footings, and foundations for the building began on April 27, 2006. On March 30, 2009, the Port Authority said that the building will be known as 'One World Trade Center', replacing its former name 'Freedom Tower'. Upon completion, One World Trade Center will be the tallest building in the United States standing at a height of 1,776 feet (541.32 m) and among the tallest buildings in the world.

Along with One World Trade Center, the new World Trade Center site will feature three other high-rise office buildings along Greenwich Street and the National September 11 Memorial & Museum. The construction is part of an effort to memorialize and rebuild after the original World Trade Center complex was destroyed during the Terrorist attacks of September 11, 2001.

**History**

Following the destruction of the World Trade Center towers in the September 11, 2001 attacks, there was much debate regarding the future of the World Trade Center site. Proposals began almost immediately, and by 2002, the Lower Manhattan Development Corporation organized a competition to determine how to use the land. Public rejection of the first round of designs, the "Preliminary Design Concepts", led to a second, more open competition in December 2002, the "Innovative Design Study", in which a design by Daniel Libeskind was selected. This design went through many revisions, largely because of disagreements with developer Larry Silverstein, who held the lease to the World Trade Center site on September 11, 2001.

A final design for the tower was formally unveiled on June 28, 2006. To satisfy security issues raised by the New York City Police Department, a 187 foot (57 m) concrete base was added in April of that year. The final design included plans to clad the base in glass prisms to address criticism that the base looked like a "concrete bunker". Contrasting with Libeskind's plan, the final design tapers the corners of the base outward as they rise. Its designers stated that the tower will be a "monolithic glass structure reflecting the sky and topped by a sculpted antenna." Commenting on a completion date, Larry Silverstein stated "By 2012 we should have a completely rebuilt World Trade Center more magnificent, more spectacular than it ever was." On April 26, 2006, the Port Authority of New York and New Jersey approved a conceptual framework that enabled foundation construction to begin while a formal agreement was drafted on the following day, the 75th anniversary of the opening of the Empire State Building. Construction began with a formal ceremony that took place when the construction team arrived. It is projected that the building's topping out will occur in late 2011. The building is projected to be ready for occupancy at some point in 2013.

**Architecture**

Many remaining vestiges of the concepts drawn from the 2002 competition have since been discarded. One World Trade Center will now consist of simple symmetries and a more traditional design intended to bear comparison with selected elements of the existing New York skyline. There will now be a central spire drawing from precedents such as the Empire State Building and the Chrysler Building (and also visually reminiscent of Tower 1 of the old World Trade Center) rather than an off-center spire intended to echo the Statue of Liberty.

According to David Childs of Skidmore, Owings and Merrill, the project architect of the new 1 World Trade Center:

Freedom Tower will be a symbol of the entire project, as well as marking the memorial, and it occupies a very important piece of New York City property: the sky.

We really wanted our design to be grounded in something that was very real, not just in sculptural sketches. We explored the infrastructural challenges because the proper solution would have to be compelling, not just beautiful. The design does have great sculptural implications, and we fully understand the iconic importance of the tower, but it also has to be a highly efficient building. The discourse about Freedom Tower has often been limited to the symbolic, formal and aesthetic aspects but we recognize that if this building doesn't function well, if people don't want to work and visit there, then we will have failed as architects.

**Design**

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| **Planned rebuilding of the World Trade Center** |
| **Towers** |
| **One World Trade Center** (Freedom Tower) |
| 200 Greenwich Street (Tower 2) |
| 175 Greenwich Street (Tower 3) |
| 150 Greenwich Street (Tower 4) |
| 130 Liberty Street (Tower 5) |
| 7 World Trade Center |
| **Memorial and museum** |
| National September 11 Memorial & Museum |
| **Transit** |
| Transportation Hub |

One World Trade Center's program includes 2.6 million square feet (241,000 square meters) of office space, as well as an observation deck, restaurant, parking, and broadcast and antenna facilities, all supported by both above and below-ground mechanical infrastructure for the building and its adjacent public spaces. Below-ground tenant parking and storage, shopping and access to the PATH and subway trains and the World Financial Center are also provided.

A 60-foot-high (18 m) public lobby topped by a series of mechanical floors form a 200-foot-square (61 m) building base. 69 tenant floors rise above the base to 1,120 feet (341 m) elevation. Mechanical floors, restaurants, and observation decks culminate in an observation deck and glass parapet that mark 1,362 feet (415 m) and 1,368 feet (417 m), respectively — the heights of the original Twin Towers. A shrouded antenna structure supported by cables, engineered by Schlaich Bergermann & Partner, rises to a total height of 1,776 feet (541 m), which is symbolic of the year the United States Declaration of Independence was signed (July 4, 1776).

The tower rises from a cubic base whose square plan—200 feet by 200 feet—(61 m by 61 m) will be almost as wide as the 208 feet (63 m) Twin Towers. The base will be clad in more than 2,000 pieces of prismatic glass; each measures 4 feet by 13 feet 4 inches (1.21 m by 4.06 m) with varying depths. It has been designed to draw upon the themes of motion and light; a shimmering glass surface drapes the tower's base and imparts a dynamic fluidity of form whose appearance will reflect its surroundings. Just as the rest of the building, the base will serve as a glowing beacon. Cable-net glass facades on all four sides of the buildings, again designed by Schlaich Bergermann, measure 60 feet (18 m) high and range in width from 30 feet (9 m) on the east and west sides (for access to the restaurant and observation deck, respectively) to 50 feet (15 m) on the north side and 70 feet (21 m) on the south for primary tenant access, activate the building at street level.

As the tower itself rises from this cubic base, its square edges are chamfered back, transforming the square into eight tall isosceles triangles in elevation, or an elongated square antiprism. At its middle, the tower forms a perfect octagon in plan and then culminates in a glass parapet (elevation 1,362 feet (415 m) and 1,368 feet (417 m)) whose plan is a square, rotated 45 degrees from the base. A mast containing an antenna for television broadcasters—designed by a collaboration between SOM, artist Kenneth Snelson (who invented the tensegrity structure), lighting designers and engineers—is secured by a system of cables, and rises from a circular support ring, similar to the Statue of Liberty's torch, to a height of 1,776 feet (541 m). Above the mast will be an intense beam of light that will be lit at night and will likely be visible over a thousand feet (305 m) into the air above the tower.

New safety features will include 3 feet (91 cm) thick reinforced concrete walls for all stairwells, elevator shafts, risers, and sprinkler systems; extremely wide "emergency stairs"; a dedicated set of stairwells exclusively for the use of firefighters; and biological and chemical filters throughout its ventilation system. The building will no longer be 25 feet (8 m) away from West Street—with the redesign and smaller base (the same width and length now as each of the previous towers), 1 World Trade Center will average 90 feet (27 m) away from the street. At its closest point, West Street will be 65 feet (20 m) away. The windows on the side of the building facing in this direction will be equipped with specially tempered blast-resistant plastic, which will look nearly the same as the glass used in the other sides of the building.

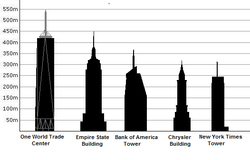
"Ultra-clear" glass, as opposed to reflective or tinted glass, is proposed for the tower's windows. This will benefit internal daylight propagation; at this stage it is unclear how the corresponding issue of solar heat gain will be addressed. 1 World Trade Center will be green in several ways. Although the roof area of any tower is comparatively limited, the building will implement a rainwater collection and recycling scheme. One World Trade Center is on track for a Gold Certification by Leadership in Energy and Environmental Design.

Its structure is designed around a strong, redundant steel moment frame consisting of beams and columns connected by a combination of welding and bolting. Paired with a concrete-core shear wall, the moment frame lends substantial rigidity and redundancy to the overall building structure while providing column-free interior spans for maximum flexibility.

Close to the building will be two glass reflecting pools. These pools are around 30 feet below the ground, and are being built on the exact locations of the former Twin Towers. The pools are intended to fill out the "footprint" of the towers, each being equal to the exact perimeter of the North and South Tower, respectively. A forest will be placed around the area containing the pools. Under the pools, there will be a museum named "National September 11 Memorial & Museum". The museum is currently under construction and its completion is planned to be on September 11, 2011, the tenth anniversary of the attacks on the World Trade Center.

Like all of the new facilities at the World Trade Center site, One World Trade Center will be heated by steam, with limited oil or natural gas utilities located on site.

**Height**



Height comparison of buildings in New York City

The roof (including a 33 ft 4 in (10.16 m) parapet) of the top floor of One World Trade Center will be 1,368 feet (417 m), the same as the original One World Trade Center. With its spire height (the criteria of two categories of the Council on Tall Buildings and Urban Habitat), One World Trade Center will stand at 1,776 feet (541 m), a figure symbolic of the year of the United States Declaration of Independence.

With a structural height of 1,776 feet (541 m), One World Trade Center will surpass the Taipei 101 (1,667 feet (508 m)) to become the tallest all-office building in the world and the tallest building in the Americas, surpassing the Willis Tower (formerly known as the Sears Tower) in Chicago.

The Chicago Spire (with a planned height of 2,000 feet (610 m)) was expected to exceed the height of One World Trade Center but its construction has been halted due to financial difficulties and its completion remains uncertain.

The World Trade Center's South Tower had an outdoor rooftop observation deck at 1,380 feet (420 m) and another indoor observation deck at 1,310 feet (399 m). One World Trade Center's indoor observation deck will be at a height of approx. 1,266 feet (386 m).

**Space allotment**

One World Trade Center will have a top floor denoted as 105. The first office floor of the building atop the 200 foot square base will be designated as Floor 20 and the building will have 94 usable above-ground floors. 69 floors will be designated as office floors, and a restaurant will make up Floors 100 and 101, while an observation deck will be at Floor 102. Additionally, roughly 55,000 square feet (5,100 m2) of retail space will exist below-grade, part of an overall 500,000 square feet (46,000 m2) of retail space to be spread throughout the site both in the below-grade concourses and on the lower floors of Towers 2, 3, and 4.

**Tenants**

The State of New York has agreed to a 15-year lease of 415,000 square feet (38,550 square meters) of space inside 1 WTC, with an option to extend the term of the lease and occupy up to 1,000,000 square feet (92,900 square meters). The General Services Administration (GSA) has agreed to lease approximately 645,000 square feet (59,900 square meters) of space, New York State's Office of General Services (OGS) plans to lease approximately 412,000 square feet (38,275 square meters) of space. In April 2008, the Port Authority announced that it was seeking a bidder to operate an 18,000 square feet (1,700 m2) observation deck on the tower's 102nd floor.

The building's first lease was announced on March 28, 2009, as a joint project between the Port Authority of New York and New Jersey and Vantone Industrial Co. based in Beijing, that will create a 190,810 sq ft (17,727 m2) "China Center", a business and cultural facility located between floors 64 and 69, that is said will represent business and cultural communities in China and serve as a hub for Chinese firms developing United States operations, as well as for US companies that wish to conduct business in China. The lease is for 20 years and 9 months.

On August 3, 2010, Condé Nast signed a tentative agreement to move its headquarters and offices of its 18 magazines into up to 1,000,000 square feet (92,900 square meters) of the building.

The chairman of the Port Authority of New York and New Jersey has stated that "One World Trade Center" is the name "that we're using" and that the name is the "easiest for people to identify with".

**Owners**

The building is owned by the Port Authority of New York and New Jersey. Around 5% equity of the building was sold to the Durst Organization in exchange of at least US$100 million investment. In return, Durst Organization assists the building construction, manages the building for the Port Authority and will be responsible for leasing, property management and tenant installations.

**Construction history**

**2004–2006**

The symbolic cornerstone of One World Trade Center was laid down in a ceremony on July 4, 2004 and further construction of the tower was stalled until 2006. The cornerstone was temporarily removed from the site on June 23, 2006. The project had been delayed due to acrimonious disputes over money, security, and design but the last major issues were resolved on April 26, 2006 with a deal between developer Larry Silverstein and the Port Authority of New York and New Jersey. During the summer of 2006, test explosives were detonated at the World Trade Center construction site, testing the use of charges to clear bedrock for 1 World Trade Center’s foundation. Three to four controlled explosions per day followed on alternating weekdays for approximately two months after.



One World Trade Center Tower Construction as of August 7, 2007.

**2006–2007**

On November 18, 2006, 400 cubic yards (306 cubic meters) of concrete were poured onto the foundation of the One World Trade Center carried by as many as 40 trucks. On December 17, 2006, a ceremony was held in Battery Park City, with the public invited to sign a 30-foot (9 m) steel beam. This beam, the first to be installed, was welded on to the Freedom Tower's base on December 19, 2006. On January 9, 2007, a second set of beams was welded to the top of the first set.

February 2007 estimates put the cost for construction of 1 WTC at $3 billion, or $1,150 per square foot ($12,380 per square meter). Approximately $1 billion of insurance money recouped by Silverstein is slated for construction of the Freedom Tower. The State of New York is expected to provide $250 million toward construction costs, and the Port Authority would finance another $1 billion for 1 WTC, through bonds.

In 2007, Tishman Construction Corporation of New York completed a row of steel columns at the perimeter of the construction site. Two tower crane bases were erected, each base containing a functioning luffing-jib tower crane. By the end of 2007, the tower’s footings and foundations were nearly complete.

**2008–2009**

In January 2008, two construction cranes were placed at the construction site of One World Trade Center. The tower's concrete core began the same year on the basement floors, but began rising in the first months of 2008. By February 22, 2008, 9,400 tons of the nearly 50,000 tons of steel necessary for the Freedom Tower had been ordered. By March 13, 2008, the steel for the tower had reached 70 feet (21 m) high, 10 feet (3.0 m) below street level. From late March through early April, a 40-foot (12 m) tall mockup of a section of the tower's wall with twenty-four windows was tested by Construction Consulting Laboratory West in Ontario, California. The two weeks of testing were done to make sure the all-glass exterior of the tower will be able to withstand earthquakes and extreme weather conditions. Testing also took place on another full-scale mockup in a rural area south of Albuquerque, New Mexico. Both mockups passed the tests. In the middle of April, a batch of concrete had to be replaced after it failed a stress test April 15.

On May 17, 2008, the tower's steel breached street level when new sections were bolted to two of the twenty-four jumbo steel columns marking the building's footprint. The new column sections brought the height of the structure up to 15 feet (4.6 m) above street level In June, the chamfered steel skeleton of the tower's concrete base had begun to take shape. By the end of the month, the concrete had been poured for the floor of the tower's basement level B3. In his June 30, 2008 World Trade Center Rebuilding Assessment to New York Governor David Paterson, Port Authority executive director Chris Ward noted that "approximately 90 percent of the Freedom Tower contracts have been bid or are ready to award."



One World Trade Center Site on July 12, 2009.

By August, 1 WTC had reached 25 feet (8 m) above street level. During its September 16 meeting, the Port Authority board approved contracts for security and building management systems; 95% of the contracts needed to complete the tower had now been signed. The $20 million security contract includes sophisticated video analysis in which computers would alert security personnel to abnormal situations automatically. On October 10, Collavino Construction poured an additional 520 cubic yards of concrete for the tower's concrete core, which was thereby raised from four inches (102 mm) below street level to 13 feet (4.0 m), eight inches (203 mm) above street level.

On February 11, 2009, the Port Authority of New York and New Jersey website posted a picture of 1 WTC showing that it was 105 feet (32 m) above street level. On April 20, 2009, a picture was posted showing that one of the cranes had risen sixty-eight feet. On July 2, 2009, over 1,200 cubic yards of concrete were poured to form parts of the street-level plaza.

On August 13, the builders of 1 WTC set a seventy-ton piece of steel into place—the largest column installed yet at the building. All twenty-four of the columns had been installed at the end of October. Each steel column—made from a factory in Luxembourg—was about sixty feet long. The columns at the bottom of the tower's foundation were about thirty-five feet long.

By November 1, the twenty-four perimeter columns of 1 WTC were all erected, and construction of the second floor (the first floor above ground level) was nearly complete. In addition, The Port Authority of New York and New Jersey reported in their 2009 Q3 Annual Report that steel erection should commence by January 2010, and that the typical floor construction could begin.

**2010**

Steel and concrete installation continued into the beginning of January, where two cranes were on site. The fifth floor was finished on January 16. In February 2010, construction began on the sixth floor, the last floor of 1 WTC's base, and the Port Authority announced that the tower's steel superstructure had reached 200 feet above street level.

In early March 2010, 1 WTC reached 200 feet above street level and construction began on the first office floor. As of March 25, 2010, while work continues on the first office floor, steel beams began erection for the second office floor above street level. In April, plans for the 45-degree octagon were installed. One World Trade Center has now installed steel to the 26th floor. Concrete was completed on the base structure in late April.

In May, the Port Authority stated that they are building close to one floor per week, and that One World Trade Center should reach fifty-five stories by the end of 2010. The cocoon system has been installed to 1 WTC. It was the first time a cocoon safety system has been installed on a steel superstructure in New York City. As of July 2010, 1 WTC's steel superstructure is 340 feet above ground and is on floor 32 and concrete installation is on floors 26 and 27. As of September, 2010, One World Trade Center has risen to 40 stories, becoming part of the skyline of New York.

**Future progress**

One WTC was expected to reach rooftop level by the fourth quarter of 2011 with topping out of the 408 foot spire to 1,776 feet by 2012. However in an October 2, 2008 follow-up report by Ward, the estimated completion of the tower was pushed back to sometime between the second and fourth quarter of 2013 with a total budget of $3.1 billion and the use of 50,000 tons of steel

**18th Century Boat Find**

On July 14, 2010 it was announced that an 18th century sailing ship had been found at the WTC site the day prior, while workers were excavating the site of an underground vehicle security center for the future building. The remains of a 32-foot hull section and a 100 pound anchor had been found, with archaeologists stating that the ship was likely used as landfill material during the early 19th century to help expand Manhattan, as the hull had been truncated and the beams sawed. Timbers from the ship were removed and sent to a laboratory to try and date the vessel.

**Construction gallery**

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| Concrete construction, as of October 7, 2006 | Steel installation, as of March 26, 2007 | Foundation construction, as of October 7, 2007 | Construction progress as of January 21, 2008 | Concrete foundation as of April 20, 2008 |
| Construction progress as of September 10, 2008 | World Trade Center above street level, February 28, 2009 | One World Trade Center construction as viewed from street level, July 29, 2009 | The final lobby column was installed, October 31, 2009 | Construction progress as of December 10, 2009 |
| Construction as of March 2, 2010, The framework for the base has been completed. | From the World Financial Center, March 8, 2010. | One World Trade Center as of April 2010 (with the National September 11 Memorial & Museum on the left) | From Church Street, May 11, 2010. | From the PATH station entrance, June 10, 2010. |
| One WTC under construction, July 18, 2010. | One WTC under construction, July 28, 2010. | Under Construction September 28, 2010. |  |  |

**Controversy**

Further information: World Trade Center rebuilding controversy

The design of 1 WTC has generated some controversy due to the limited number of floors in the previous design (82) that were designated for office space and other amenities. The overall office space of the entire rebuilt World Trade Center will be over 3 million square feet less than that of the old one. The floor limit was imposed by Silverstein, who expressed concern that higher floors would be a liability in another major accident or terrorist attack. In a subsequent redesign, the highest space that could be occupied became comparable to the World Trade Center.

After the destruction of the Twin Towers, there was an unofficial movement to rebuild the lost towers instead of building a single tower. Developer Donald Trump also unveiled a twin design, but he was not affiliated with the official project. The twin design would look similar to the original twin towers, but the buildings would be considerably taller with improved safety measures and would feature much larger windows.

Former New York Governor George Pataki faced accusations of cronyism for supposedly using his influence to get the winning architect's bid picked as a personal favor for a close friend.

The base of the tower (fortified because of security concerns) has also been a source of controversy. A number of critics (notably Deroy Murdock of the *National Review*) have suggested that it is alienating and dull, and reflects a sense of fear rather than freedom, leading them to dub the project "the Fear Tower" Nicolai Ouroussoff, the architecture critic for the *New York Times*, calls the tower base decorations a "grotesque attempt to disguise its underlying paranoia".

**Key people**

**Larry Silverstein**

Larry Silverstein of Silverstein Properties, the leaseholder and developer of the complex, will retain control of the surrounding buildings, while the Port Authority gets full control of the tower itself. Silverstein signed a 99-year lease for the World Trade Center site in July 2001. Silverstein's insurance payout has been a subject of public discourse, as he maintained that the two planes constituted two separate attacks and sued for an extra $3.5 billion. Silverstein has pledged to support the reconstruction and remains actively involved in most aspects of the redevelopment process.



Daniel Libeskind won the 2002 competition to develop a master plan for the World Trade Center's redevelopment

**David Childs**

David Childs, one of Larry Silverstein's favorite architects, initially came on board thanks to Silverstein's insistence, and developed a proposal for 1 WTC in collaboration with Daniel Libeskind, a design which was revised in May 2005 to address security concerns. He is the project architect of the new 1 WTC, and is responsible for overseeing the day-to-day design development from rough inception to final completion.

**Daniel Libeskind**

Architect Daniel Libeskind won the invitational competition to develop a master plan for the World Trade Center's redevelopment in 2002. He included an initial proposal for the design of 1 WTC, a building with aerial gardens and windmills with an off-center spire. It was also Libeskind who denied a request to place the tower in a more rentable location next to the PATH station and instead placed it a block west because in profile it would line up and resemble the Statue of Liberty. Although these designs have since been changed, his contributions continue to shape the design and development at Ground Zero, as they are revised to meet economic and security realities.

**Dan Tishman**

Dan Tishman, along with his father John Tishman, builder of the original World Trade Center, is leading the construction management effort for Tishman Realty & Construction, the selected builder for 1 WTC.

**Douglas & Jody Durst**

The co-presidents of the real estate development company The Durst Organization won the right to invest at least $100 million (but could reach as high as $300 million) in the project on July 7, 2010. They are a family owned private company that specializes in the development, managing, leasing, and operations of sustainable commercial construction space. Conde Nast, a long time Durst tenant, has also confirmed a tentative deal to move into 1 World Trade Center.

* This page was last modified on 14 October 2010 at 20:52.