

INTEGRATION OF MEMORIAL AND LAND USE AS A MEANS FOR REBUILDING IN
NEW YORK CITY

by

JANE A. RAIKES

(Under the direction of MARY ANNE AKERS)

ABSTRACT

The World Trade Center attack, September 11, 2001 represents an unprecedented tragedy in America. There is general consensus that a memorial should be built on site. Memorials are a way our society assigns significance to events and collectively provides a place for mourning. However, the nature of this memorial is highly disputed. Pressures, aside from those to build a memorial to victims, exist. The site may be required to re-establish the economy, revitalize Lower Manhattan, recreate a symbol of New York, and reassert American values. My thesis explores the precedent for integrating functional and sacred spaces to satisfy these demands. Four critical design elements: height, architecture, circulation, and activity can be used to preserve memory while re-establishing an urban environment. By integrating memorial with new uses it may be possible to recognize the past, facilitate healing through both remembrance and responsive action, and provide for a vibrant future.

INDEX WORDS: New York City, World Trade Center, Memorial, Land Use, Design

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PREFACE

JOURNAL ENTRIES

11/3

*It is my first day in New York City since September 11.
We took a taxi from the airport.
It was a warm fall day and the city was alive.
From the door of our hotel we can see the tattered buildings one block south.
It still seems unreal.
We walked to St. Paul's Chapel to meet Hank Methvin's friend Martin.
The backside of St. Paul's faces the Trade Center plaza
The relief effort is run through the church.
Hordes of tourists disturb the sanctity.
Makeshift memorials line the street.
The chapel is covered in soot.
The front porch is a lunch line.
Tired firemen and cops eat.
Inside the chapel-
 *A tapestry of letters
 Boxes of food
 Massage stations
 Foot-care stations
 Giant teddy bears
 Cots with rescue workers sleeping
 More letters
 Huge quilts and banners from all over
 An elementary school in Mississippi
 Red white and blue
 Pink walls and sky blue ceiling
 A thick haze of dust in the air
 The odd smell of sweetness and the remnants of fire
 Chandeliers almost distant in the haze.*
*We sat amongst the firemen in pews solemnly eating lunch.
A bagel, an apple, some candy.
We shouldn't be here I thought.
We are just like the tourists outside
Gawking and cheapening the sacredness.*

*We were allowed to go out the back of the chapel and walk the cemetery.
The cemetery faces the Trade Center directly.
Martin says there were flowers and grass amongst the tombs.
Now, there is only a thick gray powder and that smell.
A path led through the cemetery.
I kept trying to find a better vantage point.
Directly in front of view is a burned out building.**

*Along its sides you could see remains of the towers
Rubble – and smoke rising still!
Apparently a fire still rages below ground.
....but really the view was unsatisfying.
I returned to the back steps of the chapel.
Sycamore trees rise above the cemetery.
I looked up and saw a fireman's boot hanging off a limb.
It hit home.
That was real terror. Is that what I was looking for?
All of the trees held some remain... paper, bright colored pieces, mangled steel.
A fitting view of the destruction, through the shroud of a cemetery.*

11/4

Yesterday was the first day the city considered the site a construction area rather than a recovery operation. It's an interesting question. Should the city be sweeping away the remnants before the country has come to terms with the destruction and loss? Although I despise the tourists, perhaps seeing is a way of dealing.

The firemen obviously think it is too soon. They need to tangibly recover their lost brothers in order to move on. As Martin has said, after the tragedy, those called upon to help felt as if they had a true purpose in life. Martin is not sure how to have a fulfilling life after the need for his services ends. Perhaps the firefighters and rescue workers feel the same. To make it worse, their work really isn't done. All of the bodies have not been recovered.... And yet they never will be.

When is it time to begin rebuilding? How long should we mourn?

11/5

I got sick last night. Perhaps throwing up was an attempt to purge myself of the pain. I didn't realize it, but by the end of the day, after walking the site, visiting two exhibits, and talking to Jennifer Horn (from City Planning), little by little I became saturated. By nightfall I didn't know how to deal anymore.

The most powerful experience was my walk around the site. I walked alone from the north side east, and south to Battery Park. Then I weaved from river walk to the site and back along the west side.

At one point I was wandering next to the World Financial Center atrium in a tight space. A policeman asked me to step aside – he was escorting families of the victims. I pressed my back against the chain link fence barrier, looked up briefly at the shiny financial center towers with missing pieces, and held my breath. There were many of them, maybe 150, with hardhats clutched at their chests, talking quietly amongst themselves...many holding hands. It was if they moved in slow motion past me. I participated, I made eye contact, and absorbed their pain....but later I realized it was my own pain.

Today I am emotionally drained and find myself trying to avoid, but that isn't really possible. Although the city is alive and has pulled together since that day, you are constantly aware of what happened. From people on the street to conversations in restaurants – people are talking about it. I guess that is good. They are now able to and feel the need to talk about it. This is also part of the healing process.

For myself, I am glad to be returning home. My life has changed.

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CHAPTER 1

INTRODUCTION

The losses suffered from the catastrophic events of September 11, 2001 may haunt our generation for years to come. But what will we make of these losses? How will we go on? What will we present to the world in response to this unprecedented attack?

Originally the goal of my thesis was to propose a memorial design for the World Trade Center site. I envisioned a traditional memorial landscape that would set aside land as sacred for collective remembrance and healing. This type of memorial seemed appropriate for reaching out to both the survivors and the loved ones of the victims. I soon realized, however, that in the case of the World Trade Center, we are all victims.

The World Trade Center towers were not just any buildings. The sheer size of the towers made them regionally visible and both nationally and internationally recognized. For a short time they were the tallest buildings in the world and remained by far the tallest buildings in New York. They were a symbol of the Manhattan skyline. “Stripped of its minimalist, sculptural figurehead, the prow of Manhattan seems to disappear, rather than loom, in the distance.” (Taylor 2001) ‘As big as the World Trade Center,’ became a universal yardstick. (Robbins and Gonnerman 2001) Fifty thousand people worked and visited those buildings each day. (Gillespie 1999, p.133) Lower Manhattan relied on this activity to support the local economy and nurture the surrounding community. As part of the Wall Street financial market, the World Trade Center affected the national economy. The combination of the size of the towers and their ties to the economy produced a capitalist landmark and an icon of power and money in America. These ideals were reinforced in popular culture by countless advertisements, commercials, television shows, and movies. The World Trade Center towers “were prominent symbols of our civilization, buildings

of American invention that all over the world expressed the spirit of a will to soar above the earth in creations of steel, concrete, and glass. The terrorists chose very carefully. They discerned those skyscrapers as the cathedrals of our age and aimed at their heart.” (Architecture Week 2001, September 26)

It is clear that the extraordinary loss of life is not the only loss suffered as a result of September 11. Lower Manhattan has lost a significant portion of its urban fabric. New York has lost the architectural prowess of its distinctive skyline, and America has lost its symbolic identity. For these reasons the unprecedented tragedy in America will put unprecedented pressures on the future use of the 16-acre World Trade Center site. The rebuilding process will symbolize our new face to the world, and will be required to bolster the local economy, re-establish a vibrant urban community, honor the victims, and provide a symbol of American faith and endurance.

Therefore designing a memorial to the victims without considering the other implications at work now seems inappropriate. A future design must include both principles from memorial design and urban design such that any new landscape on the site actively commemorates the events that transpired while re-establishing a thriving urban environment. Thus the goal of my thesis is to explore the precedence for and viability of integrating memorial with other land uses on site. By integrating memorial with land use I am attempting to create sacred spaces within the everyday landscape.

My thesis is an attempt to provide design ideas through exploration of the many extraordinary aspects of the World Trade Center and its demise, but is also part of my own healing process. Chapter 2 will investigate the history of the site, from its original settlement, to its relationship with the Port Authority of New York and New Jersey, to the building of the World Trade Center and its importance in our society. Chapter 3 will examine the meaning of memorial and explore precedence for integrating memorial with land use. Then I will look at how the city of New York has organized itself for rebuilding and evaluate some of the design proposals that have been offered in Chapter 4. Finally in Chapter 5 I will investigate urban and memorial issues

at the site and propose four elements of design where memorial and land use might be integrated. In conclusion, I will evaluate the viability of this method of rebuilding.

The need for productive discussion and creative design ideas for the World Trade Center site is pressing. There is a void in the heart of New York City and “there is little doubt the city will commence the job of rebuilding, filling in the view again”. (Robbins and Gonnerman 2001) Some design experts think it is too soon to generate good design ideas. The chairman of Harvard’s Department of Urban Planning and Design, Alex Kreiger, says, “more time is needed for artists to distance themselves from the events of September 11 and thus avoid ostentation and banality in their designs.” (Fong 2002) However, Steven Cohen, director of the executive master of public administration program at Colombia University says, “This is so visible and so important, there is going to be a quick decision. There’s pressure to do something as quickly as possible, in part for the city’s psychology.” (Petersen 2002) While I agree that rushing may lead to bad design, it is apparent that the site will not remain a void for long. Designers are best equipped to deal with the many issues involved at the site. Therefore they should be part of the discussion from the very beginning. The more design ideas produced the better the chance that an exceptional design will emerge. In addition, the discussion itself is a part of the healing process.

I. Chronology: September 11, 2001

8:45 a.m.: American Airlines Flight 11 out of Boston is hijacked and crashes into the North Tower of the World Trade Center ripping a gaping hole in the building and setting it afire.

9:03 a.m.: Hijacked United Flight 175, also out of Boston, crashes into the South Tower and explodes. Both buildings are in flames.

9:17 a.m.: The Federal Aviation Administration closes all New York City area airports.

9:21 a.m.: The Port Authority closes all bridges and tunnels in the New York City area.

9:30 a.m.: President Bush, speaking in Sarasota, Florida, acknowledges an apparent terrorist attack.

9:40 a.m.: The FAA for the first time in U.S. history halts all flight operations at U.S. airports.

9:43 a.m.: American Airlines Flight 77 crashes into the Pentagon.

9:45 a.m.: The White House is evacuated.

9:57 a.m.: President Bush departs from Florida to an unknown location.

10:05 a.m.: The South Tower of the World Trade Center collapses into the streets below producing a massive cloud of dust and debris.

10:10 a.m.: A portion of the Pentagon collapses and hijacked United Airlines Flight 93 crashes in Somerset County Pennsylvania.

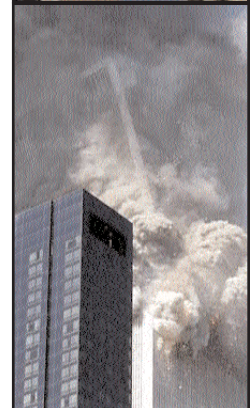
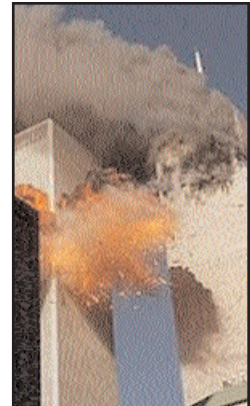
10:28 a.m.: The North Tower of the World Trade Center collapses in an extraordinary cloud of debris and smoke.

5:20 p.m.: Building 7 of the World Trade Center collapses after catching on fire at about 4p.m. Other nearby buildings remain ablaze.

7:02 p.m.: The Marriot Hotel at the World Trade Center is on the verge of collapse.

8:30 p.m.: President Bush, having returned to the White House, addresses the bewildered nation.

The death toll appears staggering...



CHAPTER 2:

SITE HISTORY

I. Early History of the World Trade Center Site (WTC)

According to the Village Voice, “Unlike other New York landmarks, the twin towers were built on landfill(ed) with drama of the past” (Yang 2002, p.26). In 1613, when Dutch fur traders settled in huts at the lower tip of Manhattan, the land now, and perhaps forever forward known as Ground Zero, didn’t exist. The Dutch settlement dubbed New Amsterdam extended to present day Greenwich Street at the shores of the Hudson. The original structures on the WTC site were docks extending into the river. The first 11 African slaves arrived at these docks in 1625 to be followed by many more. (Figure2.1)



Figure 2.1: Slave market Pearl Street
Source: <http://www.mcny.org/answers.htm>

Slaves were not the only arrivals, though. Many immigrants came in search of a new life in the New World. In 1664, the British took control of New Amsterdam, renaming the settlement New York after James Stuart, the duke of York. For years pirates and the slave trade dominated the area. In 1712, a bloody slave uprising on Maiden Lane gave cause for an African burial

ground. Later, landfill used to create the WTC site included the remains of this burial ground. After over 100 years of British control the first American blood was shed in the name of independence on the site in 1770. The British destroyed “liberty poles” stationed at the Sons of Liberty headquarters (Montagne’s Tavern) resulting in the Battle of Golden Hill. It was not until 1792 that Manhattan developed its business identity. On Wall Street, merchants and brokers agreed to sell on a common commission basis under a buttonwood tree. The curbside market became the New York Stock Exchange. (Figure 2.2)



Figure 2.2: Wall Street 1674
Source: <http://www.mcny.org/answers.htm>

Lieutenant governor and Mayor DeWitt Clinton began the expansion of the city northward in 1811. As the city grew, downtown supported large manufacturing warehouses and an ever-growing class of poor laborers and slaves. Although considered dirty and overcrowded, it also supported a thriving community. Some of the first black businessmen occupied the WTC site, including James McCune, New York’s first degree holding black doctor. At the end of the 19th century Lower Manhattan became the center of shopping and culture, and so the race began.

Four separate skyscrapers adjacent to or on the Ground Zero site claimed the title of tallest building in the world. The first was the St. Paul Building on Broadway and Ann Streets in 1898. Park Row at 32-stories quickly replaced it in 1899, also on Broadway. In 1908 the Singer Building between Cortlandt and Liberty Streets took the prize. (Figure 2.3) Then in 1913 the 54-story Woolworth Building was finished between Park Place and Barclay. It wasn't until 1973 that the title would be regained briefly by the World Trade Center.



Figure 2.3: The Singer Building razed 1970

Source: <http://www.mcny.org/answers.htm>

II. The Port Authority of New York and New Jersey:

The building of the World Trade Center was a monumental feat. Perhaps it was the final feat of American invincibility and unguarded optimism following World War II. To understand the making and unmaking of the WTC it is critical to first understand the entity that created it, the

Port Authority of New York and New Jersey. The project was a staunch reflection of the personalities involved, their grit, determination, and willingness to shoulder risk.

At the turn of the century, New York's port was by far the largest in the country. Ships unloaded cargo at the port on Manhattan Island. Trains to distribute goods were stationed across the Hudson River in New Jersey. A number of ferry services sprang up to get goods across the river, but the process was inefficient. At that time there were no bridges or tunnels allowing access to Manhattan. As the port grew in size and activity, the inefficiencies were compounded. Historically the states of New York and New Jersey had an uncooperative and competitive relationship. However, through an unprecedented joint commission a decision was made to build the Holland Tunnel to solve the port's problem. Work began in 1920.

Meanwhile, Julius Henry Cohen from the Chamber of Commerce in New York made a study of public authorities, which were common in England, but untested in the United States. Authorities sold bonds to finance public works projects. Then the public was charged for their use to pay off the bonds, thereby avoiding tax monies. Once the projects were paid off the authority ceased to exist. On April 30, 1921, Cohen convinced the legislatures to establish the first interstate agency created under a clause in the US Constitution. Unlike other authorities, this authority would exist as long as it came up with new projects. "The Port Authority would constitute a body, both corporate and politic, with full power and authority to purchase, construct, lease, and/or operate any terminal or transportation facility within said district" (Bard 1942, p.333). Its jurisdiction was a seventeen county, bi-state region within a 25 mi. radius of the Statue of Liberty. Conceptually, the agency allowed multiple projects to be conceived and progress at the same time without separate joint commission approval. Practically, it paved the way toward unaccountability. The Port Authority could acquire vast wealth and unchecked power without governmental oversight.

At first the organization was small with little money, but the roaring 20's brought a three fold increase in the number of cars on the road, and with it, a desperate need to connect the boroughs with bridges. The Port Authority hired General George Goethals, the engineer of the

Panama Canal. With his experience they built three Staten Island bridges: Goethals Bridge, the Outerbridge Crossing, and the Bayonne Bridge. These bridges, although not revenue generators, established the agency's reputation as a builder and allowed them to tackle larger projects. They built the George Washington Bridge uptown (1925-31), gained control of the Holland Tunnel (1930), and began construction of the Lincoln (midtown) Tunnel in 1934. These projects were big money makers and the Port Authority essentially controlled access to the city. During the Depression and WWII projects came to a halt, but under the direction of a new leader, Austin Tobin, the Port Authority began laying groundwork for the future. Their regional development plans included marine terminals, bridges, bus stations, airports, and roads. In addition, Lee K. Jaffe, a respected reporter, was hired to change the agency's newly acquired arrogant and insensitive image. (Gillespie 1999, p.31) At the conclusion of the war they were poised for success, mastering the mobilization of the financial community, insurance firms, contractors, labor unions, and the press. The Port Authority recruited and trained the best talent, developed a self-promotional New York mentality, and completed challenging projects carrying incredible risk. (Gillespie 1999, p.19)

III. The Trade Center Concept:

International and transatlantic trade increased dramatically during the euphoric period after the war when Europe was under reconstruction. In the postwar years between 1945 and 1970 America produced 50% of the world's goods. (Axtell 1989, p.10-11) It was the largest foreign trader and yet foreign trade accounted for only 12% of the gross national product. The New York legislature set up a World Trade Corporation to study the feasibility of a trade center in Manhattan. The city was home for many corporate headquarters, but would a central place for the exchange of paper, reflecting the enormous movement of goods give them a competitive edge? The study produced conceptual drawings for a 21-building complex over a 10-block area, containing 5 million square feet of space. The estimated cost was \$140 million. Insufficient

demand tabled the project, however, for a decade. In the meantime, New York business flourished, but most of the activity was concentrated in Midtown.

David Rockefeller (brother to Governor Nelson Rockefeller) built his Chase Manhattan Bank tower between Pine and Liberty Streets in an attempt to support the downtown area. In addition, he formed the Downtown-Lower Manhattan Association to create a strategy for revitalization. At the time, downtown was made up of banks, insurance offices, shipping offices, and investment houses, with few amenities or attractions. The bold new revitalization plan called for street closings and widenings, renewed or razed buildings, a marina and heliport on the East River, and a trade center as the catalyst of regional development. The plans for the trade center focused on a 13-acre site at the east end of Wall Street. They included a 70-story office/hotel tower, an international trade exhibition hall, a securities exchange building, enclosed retail, and a generous plaza, all elevated above the street grid on a two-story platform. The cost was projected to be \$250 million.

Rockefeller realized his trade center plan required the power of eminent domain and a great capacity to secure credit. He approached the Port Authority knowing they alone would be able to carry out a project of this scale. The Port Authority seized the opportunity, putting together an architectural advisory board, and investigating the engineering, finance, transportation access, legal issues, and size and types of firms making up the world trade community. In March of 1961 they released new plans to the public for a \$335 million project. Initial reviews from both New York and New Jersey were favorable. However, it soon became clear that New Jersey resented the fact that only New York would benefit from the project.

Governor Robert B. Meyner of New Jersey had long felt the Port Authority should take over management of the PATH trains of the Hudson and Manhattan railroad. The railroad, transporting commuters by tunnel between New Jersey and lower Manhattan, was on the verge of bankruptcy. Austin Tobin had repeatedly declined, knowing the endeavor would be a losing proposition, but when the trade center was at stake he agreed to a \$70 million railroad revival. Unfortunately, against Tobin's recommendation, Governor Nelson Rockefeller of New York

presented both the trade center and train projects as one bill to the legislature. It passed easily in New York, but New Jersey immediately saw the financial imbalance of a \$70 million train project benefiting them versus a \$335 million trade center project benefiting New York. It appeared the project was dead, but this was just the first of countless obstacles Austin Tobin and the Port Authority faced.

The Port Authority continued investigating the Hudson and Manhattan railroad. In order to revive the trains they would have to purchase the two failing office buildings above the Church Street train terminal. At first they considered demolishing the buildings and selling the air space. Then an idea took shape. What if they moved the trade center project from the east side to the west side of lower Manhattan, above the train terminal? That way New Jersey would have direct access to the trade center via train. By January of 1962 there was substantial agreement. Although public hearings produced long-winded speeches in general opposition to the Port Authority, a bill was written and passed through both state legislatures. With new found enthusiasm, Austin Tobin created a World Trade Office headed by an ambitious engineer, Guy F. Tozzoli. Tozzoli was a seasoned veteran, having supervised construction of both the port and airport of Newark. He was authorized to choose the agency's best men to staff his office, since the World Trade Center was the Port Authority's (PA) most important project. Tozzoli selected Malcolm Levy, a forty-year-old engineer with a tough guy attitude, to direct a staff of 20 architects and engineers. Brainstorming created more and more grandiose plans, but the colossal height was not revealed to the public at this stage. On March 27, 1962 the New York legislature finally signed the bill into law amid controversy over the displacement of small businesses. The new west side 15-acre site contained 280 commercial tenants, 43 industrial tenants, 100 residential tenants, and over 1000 offices. Most of the buildings were over 100 years old and in bad repair, but "radio row" was a thriving electronics retail community. The press sided with the little man and the struggle resulted in a series of court battles. In the end the Port Authority was upheld in the New York Court of Appeals when the US Supreme Court denied the case in December of 1963. During the litigation the Port Authority quietly began lining up tenants to fill

the trade center. The US Customs Service was the first to join, lending credibility to the cause. The State of New York signed up in January of 1964. However, the law required 75% of the tenants to be directly involved with international business or the servicing of it. The PA had a hard time finding these tenants. Their solution was to build the world's largest project as an attractant.

IV. Preliminary Design:

Guy Tozzoli sought the extraordinary. Frustrated with the establishment, he let his high-powered architectural advisory board go and took a chance on outsider Minoru Yamasaki. (Figure 2.4) Yamasaki's warm and personable attitude and his grasp of engineering problems impressed the PA, but they hired him most for his unique approach. He was Japanese American, practicing in Detroit, and unconnected to New York's wealthy clientele. Most importantly, once a disciple of Mies van der Rohe and his International Style, Yamasaki had rejected the popular architecture of the day. He embraced a more decorative style drawing on historical forms. He was most fascinated with design that took advantage of changes in light, requiring complex surfaces rather than the flat "all glass" facades of the International Style.



Figure 2.4: Minoru Yamasaki

Source: <http://www.detnews.com/history/yamasaki/yamasaki.htm>

Yamasaki was a graduate of the University of Washington in 1934. Some of his other works included the St. Louis Airport, the American Concrete Institute (Detroit, 1958), Dhahran Air Terminal (Saudi Arabia, 1959), Century Plaza Hotel (Los Angeles, 1961-66), Temple Beth-El (Bloomfield, MI, 1968-74), and the Performing Arts Center in Tulsa Oklahoma (1973-76). (Figure 2.5)



Figure 2.5: Dhahran Air Terminal, Saudi Arabia
Source: <http://www.m-yamasaki.com>

Yamasaki was given no plans. The Port Authority supplied the program for the site that included 10 million square feet of space devoted to office, retail, restaurants, a hotel, parking, a customs house, and the subway. All of this was to fit on a now 16-acre site within a \$500 million budget. Over a fifteen month period Yamasaki studied more than 100 schemes in model form. He concluded that one tower was unwieldy in size, and that multiple towers looked too much like

a housing project. He finally settled on two towers surrounded by a plaza and smaller buildings. The 5-acre plaza would be totally pedestrian and modeled after Piazza San Marco in Venice. Tozzoli and the PA insisted that the two towers be the tallest in the world. The resulting 110-story towers were designed with the help of the engineering firm Emery Roth and Sons of New York. (Figure 2.6)

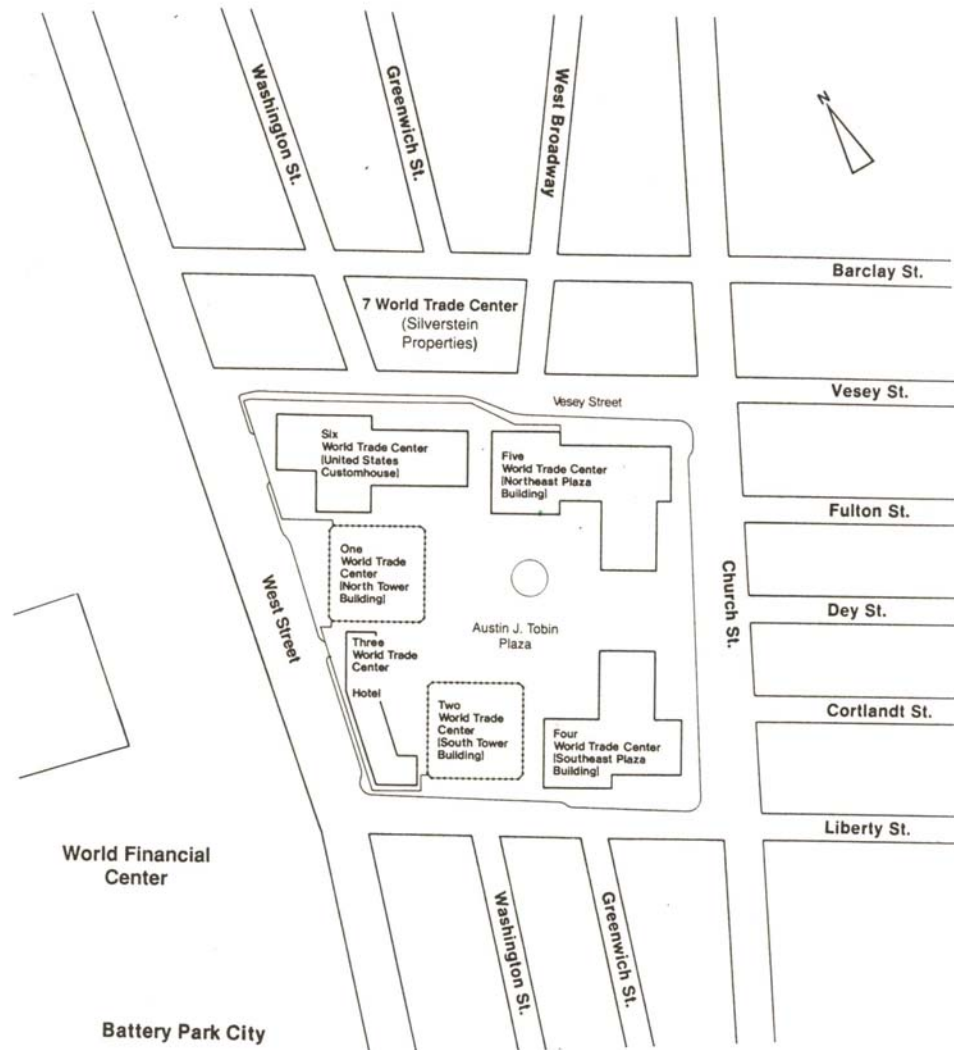


Figure 2.6: Location and layout for World Trade Center
Source: http://www.greatbuildings.com/World_Trade_Center.html

A press conference was held in January of 1964 to announce plans for the \$350 million project. As anticipated, the magnitude of the project did attract potential tenants, but it also attracted its most vehement opposition. For the first time, members of the powerful business community in New York were opposed to the project. Led by Lawrence Wien, who controlled the Empire State Building, they argued the project would completely undermine the market for office space in the city. The business community enlisted new mayor, John V. Lindsay, to block the project. The city had control over street closings the Port Authority needed for construction. For two full years argument after argument ensued. The city's issue was that the Port Authority was not obligated to pay taxes on the project. Finally they struck a deal with the help of an unassociated lawyer, George Milstein Shapiro. The deal specified that the Port Authority would pay taxes equal to that of a private developer, but only on the portion of space rented to private tenants (about 40% the first year). (Gillespie 1999, p.52) In addition, the landfill from the excavation site would be used to extend the Manhattan shoreline creating 28 acres of prime real estate worth \$90 million to be turned over to the city. The Port Authority also agreed to proceed with a \$100 million passenger ship terminal on the West Side and a \$16 million containership operation in South Brooklyn.

After nearly five years of challenge from its first conception, the World Trade Center project had a green light for construction in August of 1966. It was now in the hands of the engineers.

V. Building Design:

Ray Monti, a Port Authority engineer known for timely construction, became construction manager. The successful NY developer, Tishman Realty and Construction Co., was general contractor. The project was almost inhuman in scale. Material requirements included:

200,000 tons structural steel
6,000,000 ft² masonry walls
5,000,000 ft² painted surfaces
1520 miles wire
400 miles conduit
200,000 light fixtures
7,000,000 ft² acoustic tile
7,000,000 ft² flooring
425,000 yd³ concrete
43,600 narrow windows with 600,000 ft² glass
40,000 door knobs
1200 soap dispensers, and
2-acre, 5-story air-conditioning machines with 49,000 tons refrigeration capacity
(Enough to cool 1500 homes).
1.25 million man-hours used to excavate 1.2 million yd³ of earth, and 45,000 yd of
bedrock prior to laying the foundation.
(Robbins and Gonnerman 2001, Gillespie 1999 p.59, Matthews 1994)

The first order of business, however, was demolition of the 26 now vacant buildings on site.

Beneath the site was a maze of partially mapped pipes and cables, forgotten foundations, underground streams, tunnels, and graves. Hundreds of pipes, utilities, and water lines were relocated.

Three major technological innovations made the construction of the World Trade Center possible: the slurry wall, the unique elevator system, and the load bearing exterior walls. Details of each innovation follow.

A. The Slurry Wall:

Manhattan is an island at the mouth of the Hudson River. As mentioned before, the original waterfront was at present day Greenwich Street. Over the years, landfill operations used dirt, rubble, and old piers to extend the shore 700 ft into the Hudson. More than half of the trade center site was on this landfill. The magnitude of the towers, however, required the foundations to be anchored to bedrock. Bedrock was 65 ft below the surface, but the real problem was that the water table was only 3 ft below the surface and subject to tidal flow. How could they remove the water to build the foundation? Even if they could somehow pump the water out, it would destabilize adjacent buildings. The foundation box for the complex would be 800 ft long and 400

ft wide. All conventional methods for building the basement walls had numerous drawbacks. John M. Kyle, chief engineer for the PA came up with the solution.

The slurry trench method had been used in Europe and Canada, but not in the US. Icanda Limited of Montreal, an offshoot of an Italian company, was hired to do the job. The method required excavation of a 3 ft wide trench in 22 ft segments the same width and placement of the basement wall. The excavated area was replaced with a slurry of water and bentonite. Bentonite is a gray colored clay with a swelling tendency. It plugged the air spaces along the sides of the trench stabilizing them and preventing groundwater seepage. Once in place, pre-assembled seven-story steel cages weighing 25 tons were lowered into the slurry. Concrete was then poured in through the bottom of the trench forcing the slurry out the top. One hundred fifty two 22 ft sections were constructed in this manner over a 14-month period. The result was a waterproof exterior foundation wall or “bathtub” covering a 2 block by 4-block area. (Figure 2.7)

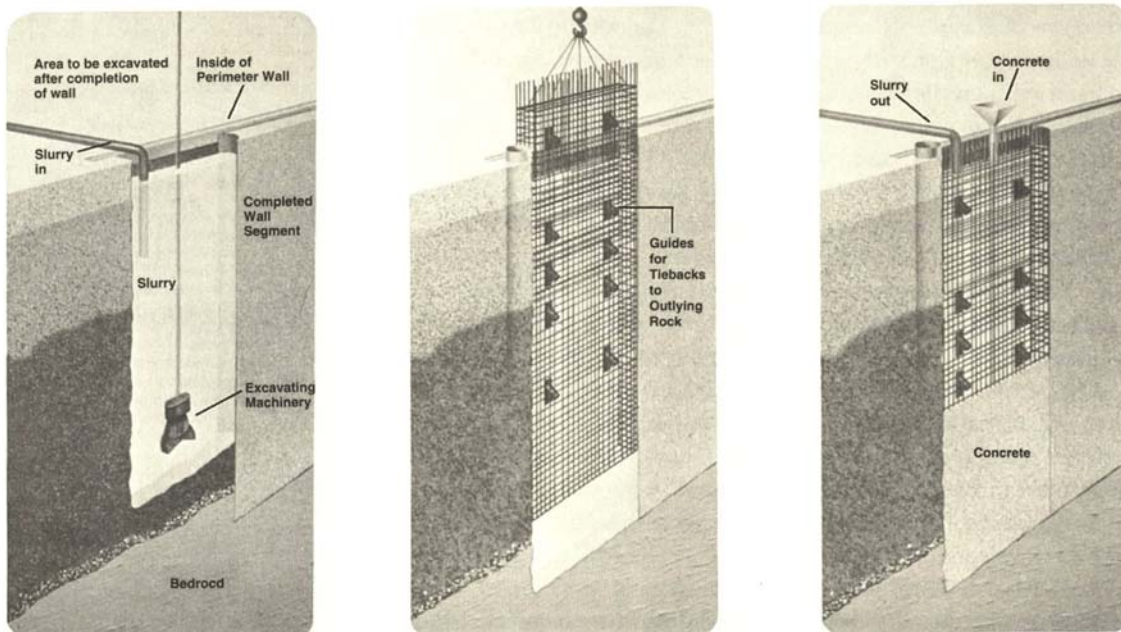


Figure 2.7: Slurry wall construction process.
Source: Gillespie 1999

Exterior tension rods bolted to bedrock supported the newly constructed wall. This created havoc for property owners adjacent to the site, but was done to prevent wall collapse as the interior was excavated. During excavation the tube tunnels for the trains were exposed and propped up 18 ft, but continued to run. Soil and rubble from the site were used to extend the shore 700 ft into the Hudson for a 1484 ft stretch of lower Manhattan. Battery Park City and The World Financial Center were eventually built on this property. Although never considered an official archeological site, many artifacts were found in the fill, including ship anchors, cannonballs, hand blown glass, coins, and a time capsule. The time capsule had a letter signed by 32 merchants from a long gone Washington Market declaring the site a marketplace forever. It seemed they would get their wish.

B. Elevator System:

The development of the elevator made the skyscraper a feasible concept. However, as skyscrapers grew taller, they housed more and more people, requiring more elevators. As the number of elevators necessary to move people increased, the amount of rentable floor space decreased. Therefore elevators not only enabled tall buildings; they also prevented buildings from growing higher than about 80 stories. The WTC towers at 110 stories needed to change current thinking on elevator configuration to maximize rentable space. Herb Tessler, a staff architect at the PA, suggested that people commonly transfer trains while traveling on subways, why couldn't they transfer elevators when traveling in a skyscraper? At first, there was concern that people would not have the patience to transfer, but Tessler's design required no more time to reach the desired floor.

The plan was based on three sky lobbies at the 44th, 78th, and 110th floors. (Figure 2.8) Twenty-three express elevators weighing 10,000 lbs. each, with a 55 person capacity, would transport passengers to sky lobby floors. These elevators traveled at a rapid 1600 ft/min, but since acceleration was slow, a passenger would not feel the speed. To maximize efficiency, people entered through one side and exited through the opposite side of the elevators.

Elevators: The Unique Skylobby System

Schematic view of Tower building elevators shows how express and local runs are separated for maximum performance—a pioneering translation into the vertical of horizontal mass transportation.

KEY
 1 Express to Top
 2 Express to Skylobbies
 3 Local Service
 4 Skylobby Floors
 5 Mechanical Floors
 Escalators
 ■ Floor Stops

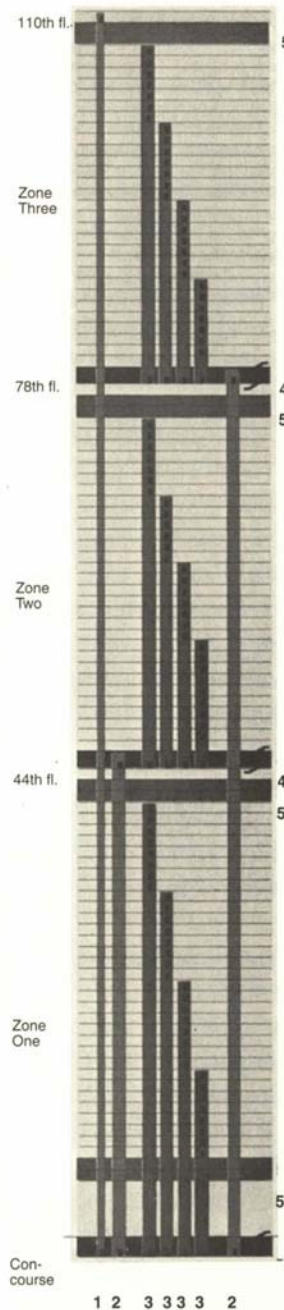


Figure 2.8: Sky lobby system of elevators
 Source: Gillespie, 1999

Seventy-two local elevators traveled to floors between sky lobbies at a normal speed of 800-1200 ft/min. (Gillespie 1999, p.77-78) To reach the 85th floor, for example, one would take an express

to the 78th floor sky lobby and then a local from the 78th to the 85th floor. Nine enormous freight elevators traveled all 116 floors from the basement to the top. The result yielded 75% useable building space as opposed to 62% in previous skyscrapers. The contract for elevator construction went to Otis Elevator Co. at a cost of \$35 million.

C. Structural System:

Skyscrapers, since the 19th century, were traditionally built with a skeleton network of interior columns to support the structure. The exterior walls were “curtain walls” or nonstructural walls that merely let in light and kept out rain. The WTC turned this system inside out. In the World Trade Center, the exterior walls carried all vertical loads as well as resisting all lateral winds. The only interior columns were in the core housing the elevators. This resulted in a maximum useable, column free space within the structure. (Figure 2.9)

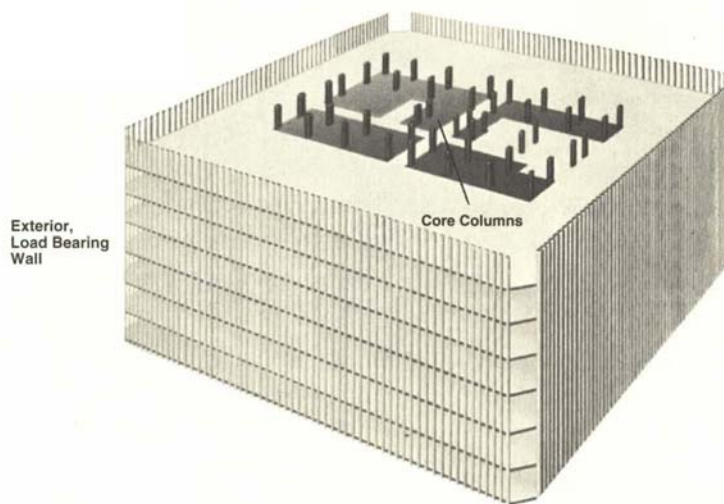


Figure 2.9: The core and exterior load bearing walls
Source: Gillespie, 1999

The exterior wall was constructed of new high strength steel columns placed 3 ft 4 in. apart. The columns framed narrow 22 in. wide, 10 in. recessed floor to ceiling windows. Rather

than the International Style skyscrapers where visitors felt vulnerable next to large glass windows, the World Trade Center towers provided a feeling of security while maintaining views. Engineers knew their design was strong, but repeatedly studied human perception and comfort. They conducted experiments to determine how much lateral sway people would tolerate in high winds. For example, the Empire State Building sways 3 in. in a 100 mph wind. Consulting engineers in Seattle lured subjects into swaying rooms under the pretense of free eye exams. In New York an office was dangled from a cable inside the airshaft of the Lincoln Tunnel. The experiments concluded that people would tolerate 11 in. of dampened sway meaning they could continue working in a tower under 140 mph sustained winds. Exact models of the towers were constructed and tested in wind tunnels at great expense. The buildings were designed to withstand 150 mph sustained winds, which has never occurred in New York. That intense a wind would give each tower a jolt like that of a collision with a 13 million pound ocean freighter.

Wind shears experienced by the pedestrian in the plaza below the towers were also considered for the first time. Thirty-five mph ground level winds are common in urban areas due to building deflection. (Gillespie 1999, p.81) The towers were placed at a sufficient distance apart to minimize sympathetic vibration and major acceleration of wind. Despite these efforts the plaza was later criticized as windswept.

VI. Construction:

200,000 tons of steel was used in construction at a cost of \$85.4 million. The Port Authority sought out a combination of small companies after two large steel producers provided unreasonable estimates. Each piece of steel was delivered to a train yard in Jersey City with a code number identifying its position on the building and the crane that would lift it. The pieces were delivered by tugboat when needed since there was no room on Manhattan to store materials. Four unusual “kangaroo” cranes from Australia were mounted in the elevator core to lift and place the steel. (Figure 2.10) Construction proceeded in 3-story increments, between which the cranes lifted themselves using hydraulics. The hardest part for the crew was climbing up the

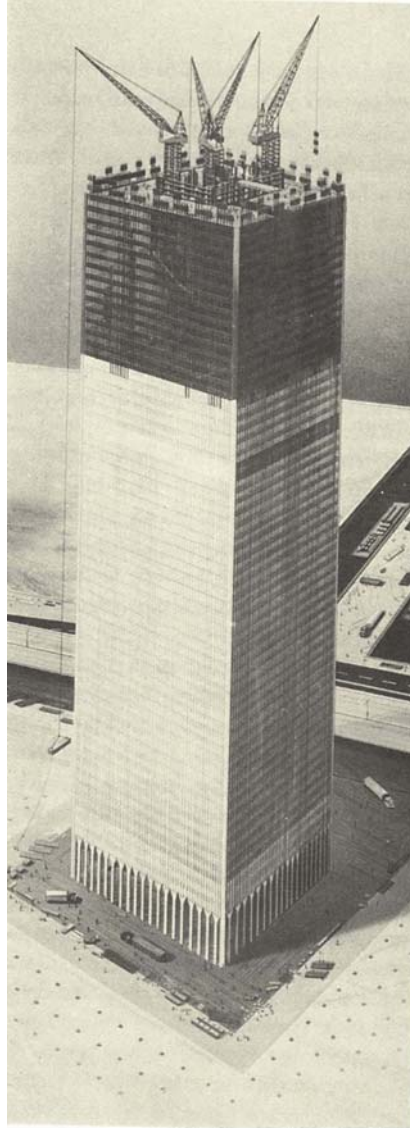


Figure 2.10: Kangaroo cranes, construction of the North Tower
Source: Gillespie, 1999

ladders and catwalks as the building grew. Despite an aggressive safety program, eight men perished during construction. The most common mishap was falling down the elevator shaft.

Construction progressed from core, to exterior walls in 3-story prefabricated pieces, to floors, and finally curtain walls made of aluminum. It was the first construction project taking precautions to contain asbestos released into the air, but controversy over asbestos as a cancer causing agent prompted the PA to change fire retardant on the 34th floor of the North Tower.

On October 19, 1970 around the 103rd floor of the North Tower one piece of steel made the WTC the tallest building in the world. By December 23, 1970 the last piece of steel was placed on that tower. It stood 1,350 ft tall. (Gillespie 1999, p.113) The South tower was not completed until July 19, 1971. Unlike most construction projects, tenants began moving in on lower floors while upper floors were still under construction. The first tenant was Irving R. Boody and Co., a raw material import/export business that moved in on December 15, 1970.

An anti-climactic dedication of the WTC did not occur until April 4 of 1973 in a driving rain. Tenants had been in residence for over 2 years, the basement levels were half finished and partially flooded, and Austin Tobin, the fearless leader of the Port Authority, had retired early worn out from the controversy. (Gillespie 1999, p.118) The project received criticism from every angle: political, economic, environmental, and architectural. Many people thought the PA should have focused on mass transit instead of following the private vision of an opportunistic leader. Others objected to the astronomical cost that topped off at \$575 million. Some took offense at the use of small amounts of Japanese produced steel. The business community still objected to the abundance of office space that would lure tenants with low rents away from Midtown. There were concerns of congestion and traffic with the advent of 50,000 extra people in the financial district daily. Television viewers complained of fuzzy reception due to interference created by the towers. Environmentalists criticized the energy waste of night lighting during the energy crisis and the 170,000-gallon daily release of raw sewage into the Hudson. All sewage below 72nd Street was being dumped untreated at the time and the WTC only accounted for 1/20th of 1%. There was even concern for night flying migratory birds that might unknowingly smash into the buildings. Architecturally the towers were considered shafts standing with blunt, graceless arrogance. In short, 1973 marked the lowest point in the World Trade Center's image.

VII. Tenants:

The mission statement says the WTC was “Designed to increase world trade by providing, at a single location, a home for international commerce with the necessary functions and services, and exchange for the processing and sharing of information and a forum for the advancement of world trade education and the encouragement and stimulation of international business cooperation”. (Gillespie 1999, p.184) Looking at the tenant mix it is clear that this goal was largely achieved. The original concept recruited a mix of small, medium, and large companies. Small companies required only a portion of a floor, while the largest company, Dean Witter, occupied 40 floors. Historically there have been five major categories of tenants: the maritime industry, commodities brokers, foreign banks, stockbrokers, and insurance companies. Over the years, due to rent increases and the proliferation of computers, the first three have slowly disappeared. Law firms and the state offices are the only tenants that aren’t involved in international trade. The World Trade Institute was the educational arm and arguably the heart of the World Trade Center. It offered courses for both amateurs and experts, encouraging people to get involved with international trade. The average occupancy of the building was 85% of capacity. During the glory years of the 1980’s the buildings operated at 96% capacity. At any given time there were 35,000 tenants and 15,000 visitors that graced the towers each day. (Gillespie 1999, p.210)

When finished, the 175 ft grand entrance to the plaza on Church Street gave way to two silver towers anchoring the south and west corners of the complex. Closely spaced metal strips formed the tower façades that widen into gothic trees in the lower 10-stories. Entrance to the towers from the plaza was at the mezzanine level. The smaller NE and SE plaza buildings, US Customs House, and hotel enclosed the plaza and offset the towers in dark brown aluminum. (Figure 2.11) At the center of “Tobin Plaza” stood a spherical bronze sculpture and a 90 ft diameter fountain. Off white radial lines in the gray-beige marble pavement reached toward the buildings. Rings of benches and a circle of flower boxes for seasonal color surrounded the

fountain. (Figure 2.12) A shopping arcade resided on a concourse level below the plaza where the lobbies of the towers could be accessed. Far below lay the bustling subway station.

Windows on the World, a private business club at the top of the North Tower, and an all weather public observation deck at the top of the South Tower, provided fantastic views. Paul J.

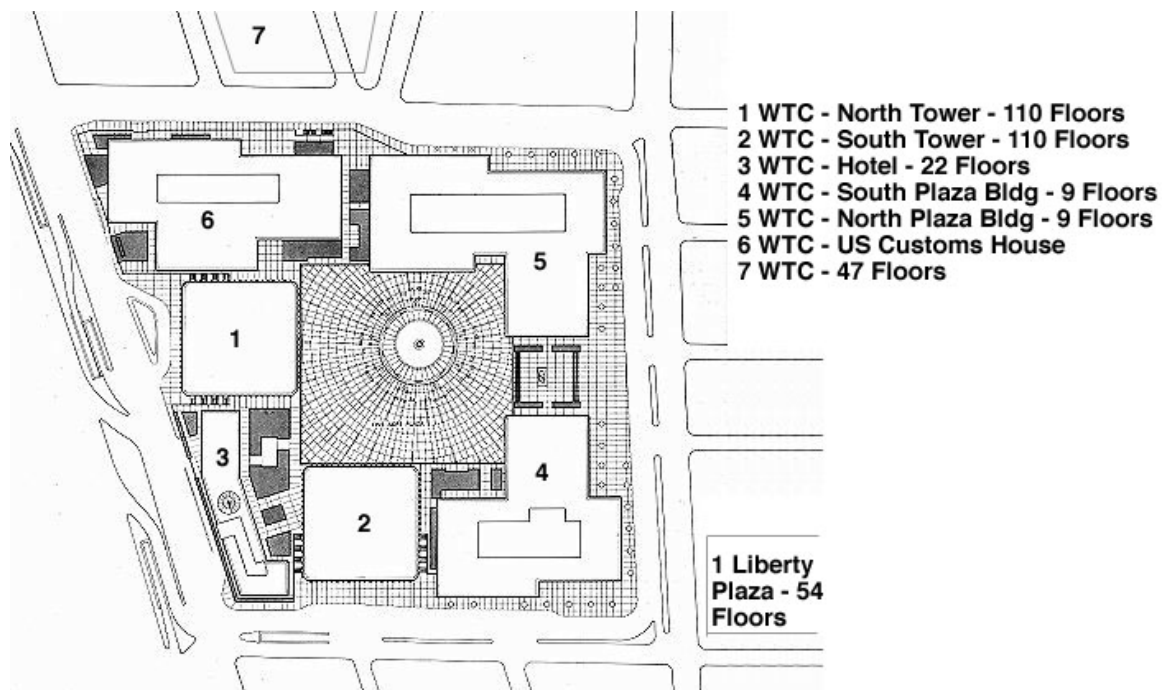


Figure 2.11: Yamasaki's plan for the World Trade Center

Source:http://greatbuildings.com/cgi-bin/gbi.cgi/World_Trade_Center.html/cid_wtc_my_siteplan.gbi

Friedlander, a travel writer for the New York Times, wrote, from up there “you see a majestic New York without perceiving the dirty sidewalks and streets, the pushing and shoving you fight your way through at sidewalk level; nor hear the traffic horns, nor choke on diesel fumes. There is a magic in altitude—crime and ghetto and politics and corruption become invisible.” (Gillespie 1999, p.153)

Architectural critics would never budge, but over time the public embraced the World Trade Center as an American icon. On September 11, 2001, however, in 120 minutes, the 40-

year history of a technological masterpiece was leveled. The exterior walls that withstood 150-mph winds succumbed to the hot flames of jet fuel, a source of destruction that could be anticipated by no amount of planning. After 6 long months of clearing debris, virtually nothing remains of the World Trade Center. A gaping hole in the center of New York City awaits rebuilding.



Figure 2.12: View of Tobin Plaza at the World Trade Center
Source: Josh Tiller

CHAPTER 3

MEMORIALS AND PRECEDENT FOR COMMEMORATION WITHIN ACTIVE LAND USE

What do memorials do and why do we create them? Traditionally, memorials have provided a place for the preservation of memory and the facilitation of mourning. Memories provide continuity in our individual and collective lives. They allow us to remember the past in ways that serve needs in the present. We need memory to reflect and heal, to inspire action, to learn, and to forgive. The preservation of memory is critical to link us to our past as we move into our future. Without memory there can be no recognition of difference. (Huyssen 1994, p.10)

Clearly, in creating memorials we choose to preserve certain memories over others. Memorials necessarily interpret the past. As a result, the reliance on the physical embodiment of memory in memorial may encourage us to forget alternate interpretations. Therefore it is critical which memories are preserved and how they are presented in design. As an example, the creators of the Holocaust Museum in Washington D.C. assumed that preserving the horrors of Holocaust memory would aid in the recognition and ending of genocidal situations. Unfortunately, this memory may cause some to aspire to the continued use of genocide as a state policy. (Linenthal 1995, p. 268) Such personal interpretation of memory explains why the focus of memorials and the conclusions drawn from them are so important.

As part of remembrance, memorials are intended to facilitate mourning. Mourning is a response to loss, a ritual that “heals” the pain of grief. (Homans 2000, p.2) Memorials provide a community setting where people with shared memories can come together for support. “The monument (or memorial) has been the material structure around which both personal and collective mourning have taken place, and it has facilitated that mourning through a process of return and release. The monument “re-presents” a past event and serves as a carrier of memory back through time to that event. After the event has been recollected and reflected upon, memory

is released, and loss is assuaged”. (Homans 2000, p.22) Thus memorials promote remembering through the preservation of memory and forgetting through the process of mourning.

I. Memorial Types:

Traditional monuments of the nineteenth century encouraged remembrance by setting aside a space for collective memory. This acknowledged the importance of the event and the losses associated with that event. Forgetting was encouraged following remembrance. War monuments, for example, often attempted transcendence of the pain of remembrance through triumphalism. (Rowlands 1999, p.131) In other words, it was claimed that the losses suffered during the war were to protect and serve a noble ideal. The ideal was meant to justify the failure to protect young soldiers’ lives and to comfort their families by declaring them heroes. The physical form of these monuments often reiterated the premise with classical sculpture.

The Marine Corps War Memorial in Washington D.C., although a twentieth century monument, is an example of this type of memorial. (Figure 3.1) It is a statue that depicts a



Figure 3.1: U.S. Marine Corp War Memorial, Washington D.C.
Source: <http://www.awildorchid.com/monuments2.htm>

famous incident in World War II where soldiers placed a flag on conquered territory at Iwo Jima. The statue stands as a symbol of esteem for the honored dead in the Marine Corp.

Although the triumphant memorial is still used, its effectiveness and appropriateness has been questioned. Does the transference of pain to an ideal really facilitate forgiveness and is it appropriate or possible to resign the loss without further explanation? Many late twentieth century designers of memorials have pursued other approaches. As a reflection of the public psyche, the expression of the monument has adapted following this century's major upheavals including both the First and Second World Wars, the Vietnam War, and the rise and fall of Communist regimes in the former Soviet Union. "The result has been the metamorphosis of the monument from the heroic, self-aggrandizing figurative icons of the late nineteenth century celebrating national ideals and triumphs, to the anti-heroic, often ironic and self effacing conceptual installations marking the national ambivalence and uncertainty of late twentieth century postmodernism." (Young 2000, p.126)

Contemporary artists and designers of the late twentieth century in Germany, for example, still have difficulty separating the monument from its fascist past. The Nazis' systematically exploited monumental forms, and the present generation has a profound desire to distance themselves from association with the Nazis. The result of this conundrum has been the advent of the counter monument, a space challenging the premise of the traditional monument. (Young 2000, p.128) The "Monument against Fascism", by Jochen and Esther Gerz, was installed in Hamburg, Germany in 1986. The counter monument consists of a 12m high aluminum pillar plated with soft dark lead. A steel pointed stylus is provided for visitor graffiti. As increments are filled with graffiti the column is gradually lowered into a chamber in the ground. After 4-5 years only the top surface of the column is visible. "The monument is a bearer or carrier of viewers' memories, imaginings, and fantasies about the events it represents. But when it disappears into the ground, viewers are left alone. They can no longer assign responsibility to the monument for supporting and carrying their memories. Unlike the traditional monument, the counter monument does not console or reassure-it does not heal." (Homans 2000,

p. 23) It forces remembrance, but no resolution is provided. The burden of memory is transferred back to the viewer. As a reaction to the traditional memorial, the counter monument is intellectually interesting. However, as a monument it may hinder rather than aid the mourning process by transferring the burden of memory back to the viewer.

Between the monument and counter monument exists a continuum of memorials that balance ideas from both ends of the spectrum. Perhaps the most successful modern memorial in the United States is the Vietnam Veterans Memorial in Washington DC. (Figure 3.2)



Figure 3.2: Vietnam Veterans Memorial, Washington D.C.
Source: <http://www.ayshah.com/wallapproach.jpg>

Although its form is simple, a polished black granite wall listing the names of soldiers lost in the conflict, the symbolic meanings are complex. It is successful because “it defines the memory of the war as that of the Americans who gave their lives in it, emphasizing individuals rather than any transcendent national symbol.” Visitors have tangible evidence of the magnitude of the loss

and they can readily identify with the names of people. They interact with the names and the loss by taking rubbings or leaving objects of love. However, underlying the individual focus of the memorial is the wall itself. The wall is set into the ground such that the visitor must embark on a journey travelling below the ground surface to view the names. At its center, the wall seems insurmountable, but by the end the wall melts away and the visitor rises from the journey. Each end of the wall points to other war memorials, the Washington Monument referring to the Revolutionary War (a “good” war) and the Lincoln Memorial referring to the Civil War (a tragic war). The names of the victims are listed in chronological order, but begin and end at the center of the wall. Finally, the high polish of the black granite surface allows it to appear as a window leading to the past or as a mirror bringing the past represented by the names to the present. (Smith 2000, p.106) Visitors see their own reflection and the reflections of the other memorials on the mall in the names. (Figure 3.3) The names encourage remembrance, but the wall encourages visitors to reflect on the meaning of the loss and the value of a war that is still controversial.

This memorial, like the traditional monument, sets aside a prominent space for the remembrance of the event. However, it encourages mourning through reflection and understanding rather than idealization and heroism. Like the counter monument, this memorial cannot accept feeble or heroic attempts to blind the visitor to the loss, but unlike the counter monument, it does not allow the visitor to leave completely disillusioned. Although a resolution is not provided greater knowledge and understanding of the event encourages healing.

The common theme among memorials, be they traditional or non-traditional, is the designation of space solely for the remembrance of a past event. The prevention of further use of the site for other than memorial traditions has come to signify the community’s respect for the importance of the memorialized event within the history of that community. Glassie describes the sacred as a contained space set aside for a special purpose. (Glassie 1997) The memorial becomes this sacred space. In some cases this is because the tragic event took place on that site,



Figure 3.3: Figures reflected in the black granite wall, Vietnam Veterans Memorial, Washington D.C.
Source: <http://vietnam-veterans-memorial.visit-washington-dc.com>

like the Oklahoma City bombing site. In other instances space unaffiliated with the event takes on meaning, like the prominent site of the Vietnam Veterans Memorial on the Mall in Washington D.C.

In America, memorials have become prolific. This may be a combined result of America's youth and its vast expanse. Since our country is very young it lacks the perspective that history affords. Each event that occurs commands great importance impacting the collective

psyche. In Europe, presumably fewer events are of such importance, because history has allowed comparison to an archive of many preceding events. In addition, America is wealthy in land. It can easily set aside land for memorial purposes when plenty of land remains for other land use. In Europe the setting aside of land requires the sacrifice of much needed space.

II. Memorialization at the World Trade Center:

The events at the World Trade Center on September 11, 2001 present a unique problem for memorialization. The nature of the loss and the type of destruction are unprecedented in America. Therefore it seems indisputable that the event be memorialized. But should the entire site become a memorial? The WTC site covers 16-acres in the heart of New York City, the largest and most densely populated city in our country. In addition, Manhattan is an island with a confined amount of space. I contend that a conventional memorial is inappropriate for this site.

The void that is now Ground Zero opened a giant gap in the urban fabric of a vibrant community. In order for that community to survive and heal its wounds the gap must be reincorporated into the living city. A traditional memorial that sets aside the space would only change the nature of the void rather than fill it. Due to the expanse of the site, the impact of such a large memorial would be a constant and unavoidable reminder to the inhabitants of Lower Manhattan of the event. This would hinder rather than facilitate the healing process and would retard the shaping of a new future. In addition, the site sits at the crossroads of one of the largest business districts in the nation; even today nearly 300,000 people live and work in the financial district. To the north, the neighborhoods of TriBeCa, Little Italy, and Chinatown have experienced business revenue losses as high as 70%. (Lehrer 2001) The Twin Towers themselves housed 10 million square feet of office space and drew 50,000 people to Lower Manhattan a day. The site also served as a transportation terminal to and from New Jersey. The loss of this local economic activity alone would cripple the surrounding communities.

Economically, the location of the 16-acres makes it, perhaps, the most prime real estate in America. In the 1970s the 24-acres of land created along the west shore of Lower Manhattan by

the original excavation of the WTC site was worth \$90 million. That site now contains the World Financial Center and Battery City Park (a residential community). Thirty years later the adjacent 16-acres must be worth a staggering sum. Therefore political and economic pressures to build on the site would be significant obstacles to the traditional memorial.

Finally, the fact that the attack on the World Trade Center was a symbolic affront to the American capitalist ideal requires a response beyond memorializing the lives of the victims. The nature of the loss is a call to action in addition to a call for remembrance. We must actively forge a new future in the pursuit of twenty-first century ideals thereby creating a new symbol for America. Therefore a memorial at the WTC site needs to rebuild an active land use reconnecting the urban fabric. In order to do this the memorial must be integrated into the new land use and this new land use must be integrated into the memorial theme. The separation of history and commemoration from our active daily lives must be avoided.

The question remains, however, can an active land use support a sacred space? According to Judith Wasserman, “a social view of sacred and sacred space is that which holds specific rituals carried out for individual or community well being”. (Wasserman 1998, p.43) Can such ritual be incorporated into the activities produced by the new land use? “In the past the focus of memorials and monuments was to maximize visual impact. However, phenomenologists note the centrality of the body and movement in commemorative experience, indeed, claiming there is no memory without body memory.” (Wasserman 1998, p.45) This suggests that if the community experiences the memorial through the daily activities in their lives on the site, they will be better equipped to understand and deal with the events that took place. “Really good memorials allow the visitor not only a deepening of intellectual knowledge, but the gaining of experiential insight as well. Through experiencing spaces, viewing and touching artifacts, moving in ritual patterns, and engaging in community activity, the viewer becomes an active participant in the experience of memory.” (Wasserman 1998, p.43) Although traditional memorials set aside space for remembrance to signify the importance of an event, the integration of memorial with our daily

lives may actually increase rather than decrease knowledge of significance and sacredness, underscoring the importance of commemoration in the community setting.

III. Precedent for Integration of Memorial With Land Use:

If this integrative type of memorial is appropriate for the World Trade Center site, is there any precedent for it? I began first by looking at European cities that were bombed in World War II. Like the events of September 11, these cities experienced overwhelming losses of life, architecture, and spirit. Since the cities were rebuilt, the goal was to seek evidence of commemoration of the events in the rebuilding process.

Budapest, Hungary was part of the front line of fighting in WWII between December 1944 and February 1945. Twenty-six percent of all buildings, 94% of industrial buildings, and all bridges over the Danube were reduced to ruin. (Harrach 1990, p.155) Among the hardest hit were the civil quarters and Royal Residence of the original walled city of Buda referred to as Castle Hill. (Figure 3.4) The destruction wrought in 1945 had one extraordinary consequence of stripping layers away to reveal old remains from previous periods of the city's history.

This stretch along the Danube was settled in the tenth century and became Buda after 1241. During its Golden Age in the 14th and 15th centuries, it was considered one of the most beautiful Gothic cities in Central Europe. This Golden Age was ended by Turkish occupation lasting 150 years. Finally the city was retaken, but in the process most of its Gothic buildings were destroyed. In 1686 Buda was rebuilt in the baroque style over the medieval ruins.

The layers revealed in the civil quarters of the city were considered a historic ensemble representing past periods and reconstruction after WWII sought to preserve the ensemble. The circulation patterns and unscathed buildings were preserved as were the fragments of buildings that remained, marking the significance of the recent events. Both the medieval and baroque ruins revealed were incorporated into the new buildings bringing to light the palimpsest of history. For example, a Hilton Hotel was constructed on the former site of both a medieval church cloister, from Turkish occupation days, and later a Jesuit boarding school. Each

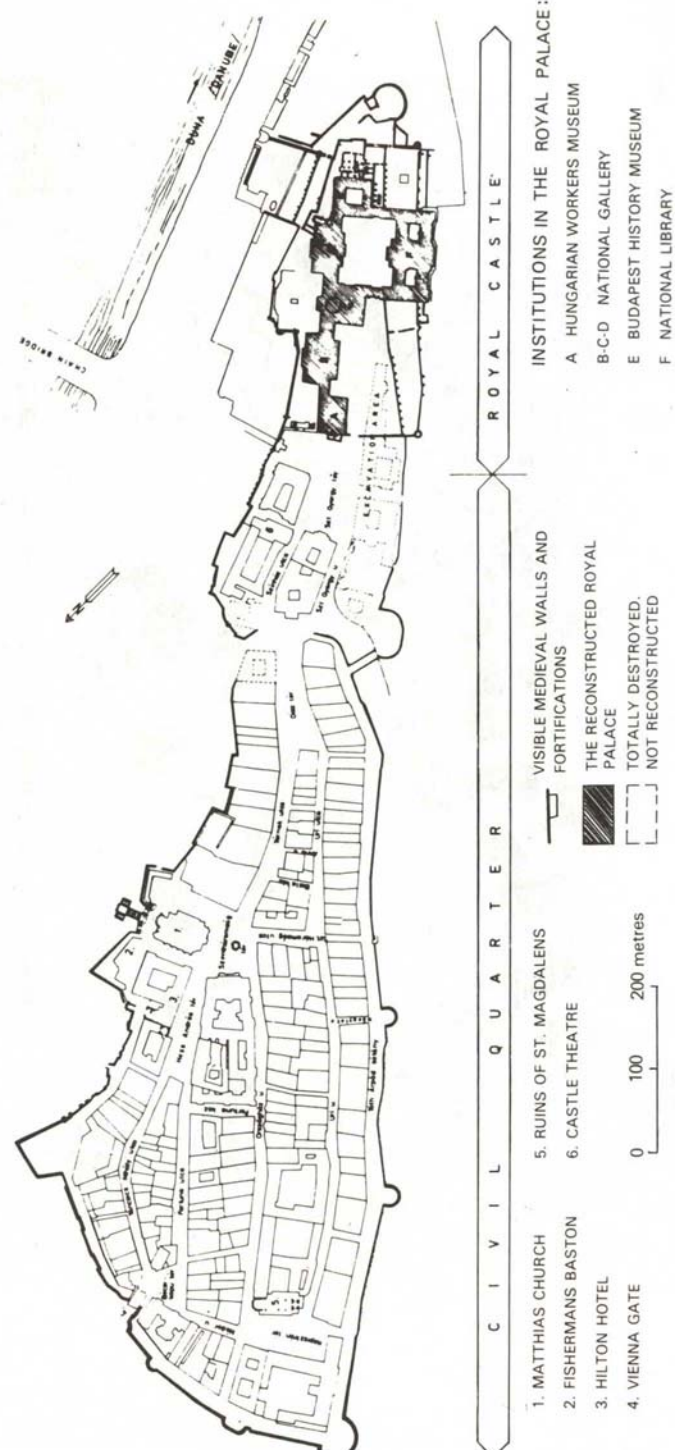


Figure 3.4: Plan of Castle Hill, Budapest, Hungary
Source: Harrach 1990

remaining layer of history was excavated and incorporated into the new land use. The internal space of the ruined church (the chancel, the triumphal arch, and the Gothic choir screen) remains perceptible including three late Roman windows and completed Gothic stone cast columns that now serve load-bearing functions. (Figure 3.5) “The resultant open space offers a realistic spatial



Figure 3.5: Internal space of Turkish era church cloister (now used for evening entertainment) incorporated into the modern Hilton Hotel, Budapest, Hungary
Source: <http://www.ehi.com/.../hungary/budapest-hotels-budapest-hilton.htm>

experience to the observer.” (Harrach 1990, p.164) The main entrance of the hotel incorporates and completes the baroque façade of the former boarding school. (Figure 3.6) “When reconstructing this façade, the goal was not only to achieve authenticity, but also to ensure that the present building was not larger in bulk than its predecessor.” Therefore, not only was the



Figure 3.6: Historic baroque façade of Jesuit boarding school incorporated into façade of the modern Hilton Hotel, Budapest, Hungary
 Source: http://www.hotelbook.com/static/welcome_01306.html

character and remaining portions of architecture preserved, but also the spatial relationship to the city.

In this instance, the commemoration of the event is found in the architecture of the reconstructed portion of the city. The city once again becomes active and is used rather than being set aside for remembrance, but a record of the tragedy is evident in the buildings themselves.

Middelburg, Holland, a town of 20,000 was bombed May 17, 1940. Its reconstruction was considered of utmost importance under the authority of The Hague, as a treasure house of Dutch architectural history. (Bosma 1990, p.64) The directive for rebuilding was to maintain the unique spirit or character of the old city. To this end, although exact architecture was not replicated, the vernacular style was followed as a reference to history. In addition, the texture, scale, and vistas of the former city were preserved. Old circulation patterns gave way to modern accommodations for traffic, but the new loop road around the city was built where the old city

wall had been. As in Budapest, Middelburg has commemorated the bombing event in the architecture and spatial organization of their city, however the expression is subtler. There is greater emphasis on the future and the city's growth.

These two examples are in direct contrast to rebuilding in Germany after the war. Hamburg Germany was particularly hard hit. In July of 1943 Hamburg was bombed and the subsequent fires caused a hurricane consuming the oxygen over large areas. An estimated 40,000 people died, 40,383 houses were destroyed, and 263,000 homes and flats were lost- 48% of the stock of housing. (Gutschow 1990, p.118) The results were nothing other than catastrophic. At first no rebuilding could even be conceived, but gradually plans emerged reflecting the inability to process the events that had taken place. The city was considered dead, including its historic traditions, and the death as a constant reminder was to be swept away. The topographic traits underlying the ruins were considered the immortal soul that could never die, and therefore rebuilding would bring the inhabitants closer to the soil to encourage healing. (Gutschow 1990, p.115) To that end the rebuilding strategy focused on dispersed small pockets of development. (Figure 3.7) This neighborhood style planning was popular in many European cities after the war, but was blended with traditional historic developments. Unlike other European cities, Hamburg, and much of Germany, completely discarded historic tradition when rebuilding.

Despite the lack of commemoration in the rebuilding strategy, an active source of commemoration was provided through a festival of reconstruction. Men, women, and children came together to plant trees in the city's green spaces as a symbol of the process of reconstruction. "Collective planting of trees expressed the will to survive". (Gutschow 1990, p.124) The trees serve as a living memorial incorporated into the fabric of the community and the act of planting is a ritual tradition for healing.

In Hamburg, the commemoration of the bombing and the war is in the living entity of the land- it communally facilitated healing where the architecture and remnants of society could not. The commemoration is in the strategy for new life that the city pursued.

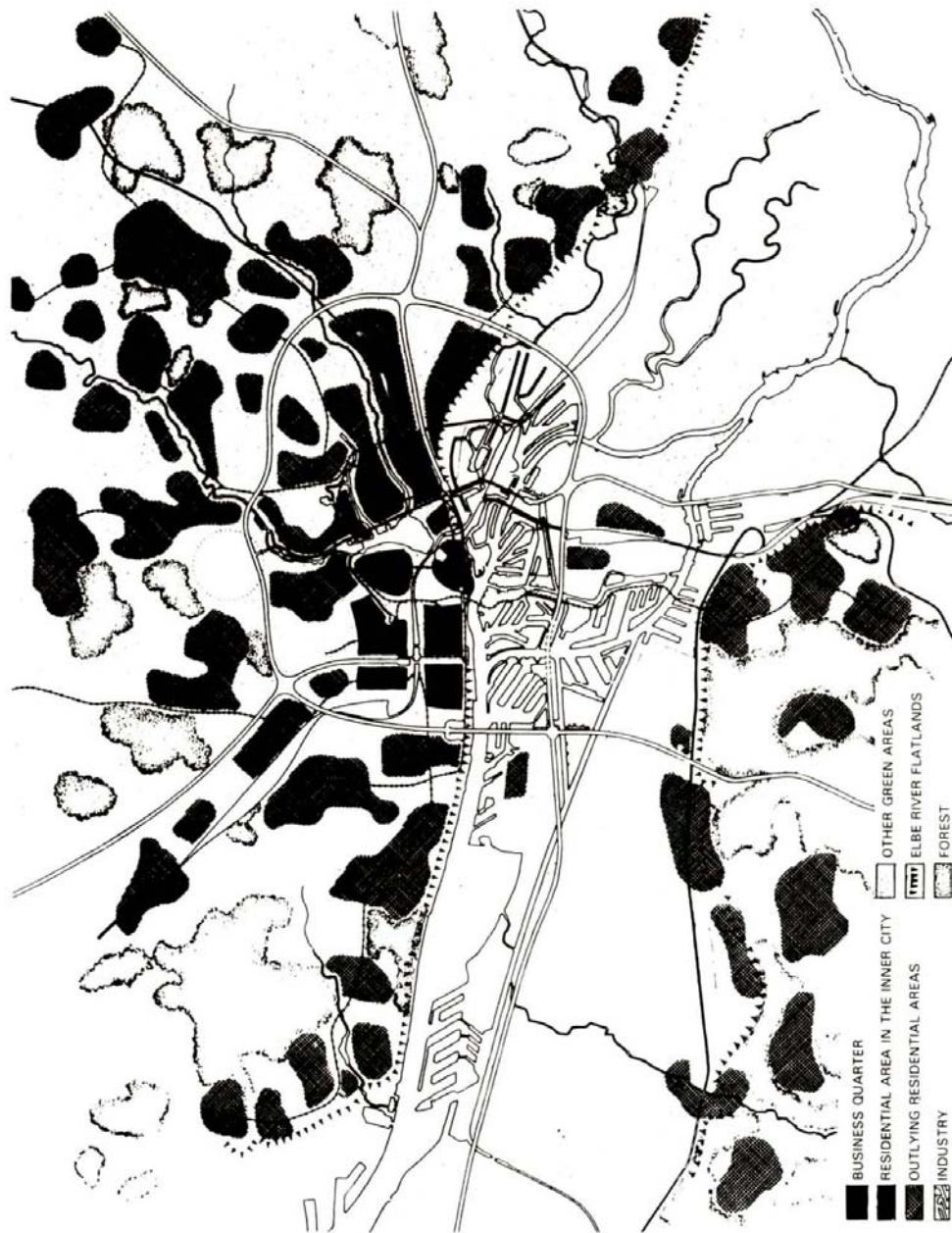


Figure 3.7: Plan for urban landscape after rebuilding with dispersed neighborhood pockets (designed by Konstanty Gutschow, Summer 1944)
Source: Gutschow 1990.

On the opposite end of the spectrum, the people of Warsaw pursued reconstructing Polish culture. Unlike other cities that suffered war damage, Warsaw was a special case. For 400 years it had been the capital of Poland and the center of science, culture, and industry. The Nazis sought to completely annihilate the city and any trace of Polish culture. In September of 1939 a three-week siege took 60,000 lives and 12% of the building stock. The siege marked the beginning of a brutal five-year Nazi occupation. The Nazis prevented any rebuilding and further systematically carried out a plan for the destruction of remaining buildings with historic value. Of a total of 957 structures classified as historic, 782 were completely destroyed, and 141 were partly destroyed. (Jankowski 1990, p.80) In 1942 the Nazis began the liquidation of the Jewish Ghetto, shipping the city's remaining 320,000 Jews to concentration camps. In 1944 the Polish Home Army mustered an uprising that lasted sixty-three days and resulted in 150,000 deaths. By the end of the war 700,000 were killed, accounting for 60% of the prewar population, and 80% of the city's buildings were in ruin. (Jankowski 1990, p.80) Under unbearable conditions, the people of Warsaw returned to their city and with determination to re-establish the Polish capital, began the rebuilding process.

In Warsaw, reconstruction walked a balance between the past and the future. Foreign specialists provided advice in planning the integration of historic elements into a new, modern city. In effect, the historic elements formed a network within the new city, giving context to the surrounding areas. The historic center of Warsaw, "Old Town" was replicated exactly as it had been before the war. (Figures 3.8, 3.9) Then a series of additional locations of 'national remembrance' were distributed throughout the city. These included: the Tomb of the Unknown Soldier in the only preserved fragment of the Saxton Palace colonnade; 220 commemorative tablets at the sites of public executions; a memorial tree bearing the names of those murdered in Pawiak Prison; fragments of the Ghetto wall; and traces of bullets on the walls of old houses. "The reconstruction of historic ensembles played a particularly important role in shaping Warsaw's unique spatial character and in forming the emotional ties of its inhabitants with their city." (Jankowski 1990, p. 88)



Figure 3.8: Old Town Square, Piwna Street, Warsaw, 1944
Source: Jankowski 1990



Figure 3.9: Old Town Square, Piwna Street, Warsaw, rebuilt 1953.
Source: Jankowski 1990

Nearly all of Warsaw was destroyed and countless atrocities occurred during the war. However, the entire city could not become a memorial. The living needed to carry on with their lives. As a result, a network of remembrance of both lives lost and cultural heritage was created within the active new city. In this way, a healthy balance of the past and the future enrich the lives of the residents today.

In the United States, aside from natural disaster, destruction caused by the ravages of the Civil War is our only experience with physically rebuilding cities. This destruction, however, was not unexpected. Pearl Harbor suffered the first completely unexpected outside attack on US soil, but it was aimed at the military rather than civilian cities. A striking force of 353 Japanese aircraft entered Pearl Harbor on December 7, 1941. The attack resulted in 2,395 deaths including 54 civilians. Twelve ships and 165 planes were lost. (Pearl Harbor Remembered 2001) Following the tragedy Ford Island Naval Air Station resumed its functions as an active military base. Many of the damaged ships were repaired and reused in the war effort. A memorial was erected as a floating observatory affording a look back in time at the ruins of the U.S.S. Arizona still at the bottom of the Harbor where it sank. Similar to many European cities, commemoration resided spatially within the active land use in the preservation of architectural evidence.

IV. Thematic Integration of Memorial and Land Use:

In each of the above examples there is precedence for commemoration integrated spatially with new land use on the sites of tragic events. In other words, remembrance resides on the site side by side with new land uses. The remembrance is manifested in the form of architecture, circulation patterns, the land, and traditional monuments and plaques. These cases do not, however, thematically integrate memorial with future land use. The new land uses create living and working spaces, but do not attempt to resolve or provoke better understanding of the events that transpired. Can the new land use itself function as an active commemoration where physical memorialization is tied to that activity?

The rural cemetery movement, although not a result of a single tragic event, combines memorial and active land use spatially and thematically. This movement began in America in 1831 with the establishment of Mount Auburn Cemetery in Boston Massachusetts. Prior to this time the dead were buried next to churches or on town commons, but problems with pollution, crowding, and neglect inspired the creation of cemeteries out in the ‘country’. Mount Auburn was designed as a picturesque landscape combining art and nature. Characterized by natural terrain, winding roads, trees, ponds and wildlife, it was meant to surprise and delight the visitor with new views around every corner. Plenty of room afforded the opportunity for sculptural grave markers.

Rural cemeteries were built as memorials to the dead, but it was said “cemeteries should be places where the beauty of nature is heightened by the care of man, where the gloom of death cannot sadden the hearts of the living.” (Sloane 1991) (Figure 3.10) In addition to memorial these places were designed as escapes from the urban lifestyle. They were the first planned landscapes open to the public and as a result became playgrounds. The interaction between life and death on these sites changed communal views of death. The new land use symbolically breathed life into the dead and removed the mystique about death. In this way, the land use is a



Figure 3.10: Present day rural cemetery

Source: <http://mai.mercyhurst.edu/Research/Erie%20Cemetery%20Project.htm>

direct reaction to and itself becomes commemoration. There is no better way to commemorate the dead than by living. The physical memorialization is in the beauty of the site that is both a tribute to the living and the dead.

Aside from rural cemeteries, many ‘living memorials’ throughout the US and elsewhere reflect active commemoration. For example, the Oncology Clinic at the Franklin County Hospital in Greenfield, MA was built as a memorial to Bob Benneyan. Benneyan was a general surgeon at the hospital who died of leukemia. Eight doctors donated money for the clinic in his name. Here the physical manifestation of the memorial as a building is unimportant. The commemoration is in the active attempt to save lives from Bob Benneyan’s fate, but is also an avenue for remembering him. The activity is the route through which healing takes place and it is also the route through which a better future is forged. Although a single tragic event may inspire this type of memorial, the site of commemoration no longer holds significance.

Perhaps the most closely related event to the World Trade Center disaster is the April 19, 1995 Oklahoma City bombing. The bomb exploded outside the Alfred P. Murrah Federal Building killing 168 people and defacing the 9-story building. In both cases terrorism prematurely took the lives of victims without evident cause. The need for memorial in Oklahoma City was indisputable due to the unprecedented nature of the tragedy in America. A 350-member task force (The Oklahoma City National Memorial Foundation) decided upon a democratic, three stage design process. First, the symbolic memorial was built on a three-acre plot where the Murrah building once stood. The second stage, a Memorial Center including a museum and visitors center, is currently under construction. Finally, the Oklahoma City Memorial Institute for the Prevention of Terrorism created a public/private research center off site.

A jury of families, survivors, and design professionals chose the symbolic memorial, designed by Butzer Design Partnership. (Figure 3.11) Similar to the Vietnam Veterans Memorial in strategy, this memorial sets aside a place for remembrance that focuses attention on individuals and encourages reflection. It consists of a number of memorial elements. Two “golden gates” form the main entrances to the site that was once a city block. “One is inscribed 9:01- the last

innocent moment before the blast- and the other 9:03, presumably the time when mourning began. The deadly moment between is represented by a shallow, glassy reflecting pool.” (O’Connell 2000, p. 73) One juror perceived the pool as a “brilliant play on the tug between good and evil: the pit recalls hell, yet the water reflecting the vast Oklahoma sky recalls heaven. The bombing similarly reflected the best and worst in humanity.” Beyond the pool lies a field of empty chairs, each with a victim’s name, organized in 9 rows according to the floor on which the victims worked. (Figure 3.12) “Their forms are edgy, uncomfortable-looking, a subtle reminder of the violent nature of the event.” (O’Connell 2000, p. 74) Other elements of the design include a rescuers’ orchard, a children’s’ area with brightly colored tiles, and the survivor tree (a tree that miraculously survived the blast).



Figure 3.12: View of field of empty chairs lit at night, Oklahoma City Bombing Memorial
Source: O’Connell 2000

Unlike the Vietnam Veterans Memorial, in my opinion this symbolic memorial tries to accomplish too much. The division of the landscape into areas with different themes dilutes the overall impact of the space. For example, the children, the rest of the victims, and the rescuers each have separate memorial spaces within the landscape when the museum could recognize each of these participants in the tragedy. The grace and ultimate impact of the Vietnam Veterans Memorial is in its simplicity of form. By dividing the memorial space, the Oklahoma bombing memorial combines too many simple forms.

The memorial is a success, however, in having both a place of remembrance in the symbolic memorial and an active response to the event. The Oklahoma City National Memorial Institute for the Prevention of Terrorism is dedicated to preventing and reducing terrorism and mitigating its effects. (Oklahoma City National Memorial Institute for the Prevention of Terrorism 2002) The not-for-profit organization grew out of a desire of the survivors and families to have a living memorial. Unfortunately, this institute is not a symbol of the rebirth of the site. The site of the bombing has been completely set aside for remembrance, while the active land use attempting to resolve issues associated with the event resides elsewhere. Overall, the Oklahoma City response to the bombing incorporates elements necessary at the World Trade Center site, but not as a tool for giving new life to the site itself.

It is evident from the above case studies that remembrance can exist both spatially and thematically within new land uses. We have explored physical references to memory represented by architectural preservation, networks of preservation within new land use, and the complete transformation of lifestyle on the sites of remembrance in Europe. In addition, we have explored land use as a response to remembrance. This was witnessed in the celebration of life at rural cemeteries, although no single event created these memorials. It is also reflected in the creation of institutes like hospitals or research centers in response to tragic events. These living memorials, however, although new land uses, have not transformed the site of an event itself. Therefore memory is removed from its origin. Each of the above cases describes components necessary at the World Trade Center site, but none combine all elements. There may be no single precedent

for the need in New York City today. This only underscores the importance of the September 11 attack on the World Trade Center, New York, and America, and our response to it. A balance of the past and the future must characterize this site. Principles from traditional memorials must be integrated with an active future land use that both responds to the disaster and allows the re-knitting of the torn urban fabric.

CHAPTER 4

CURRENT PLANNING AND DESIGN PROPOSALS

I. Current Planning in New York:

A flurry of activity has transpired since September within the political arena. The Lower Manhattan Redevelopment Corporation, a subsidiary of The Empire State Development Corporation, was quickly assembled to help rebuild the site and revitalize the whole of Manhattan south of Houston Street. It is an 11-member panel with vague responsibilities, however, it will most likely control federal aid expenditure and have the power to acquire and condemn property. (Czarnecki 2001, December 3) Governor George Pataki appointed seven members, while Mayor Rudolph Giuliani appointed the remaining four members. John C. Whitehead, former chair of the investment firm Goldman Sachs and Co. and the Federal Reserve Bank of New York heads the committee. Other members include:

Ed Malloy, President, Building and Construction Trades Council of Greater New York
Lewis M. Eisenberg, Resigned Chairman of the board of commissioners, Port Authority of New York and New Jersey
Roland W. Betts, Owner Chelsea Piers and former owner of the Texas Rangers baseball team
Madelyn G. Wils, Chair of Community Board No.1 (Financial District and TriBeCa)
Frank G. Zarb, Former Chair of the Nasdaq
Deborah C. Wright, Chief Executive of Carver Federal Savings Bank, Harlem
Richard A. Grasso, Chair of New York Stock Exchange
Robert M. Harding, Deputy Mayor for economic development and finance
Howard Wilson, Chair of School Construction Authority
Paul A. Crotty, Public Affairs Executive for Verizon Communications

A number of organizations representing a cross-section of New York City's civic leadership have quickly mobilized to consider the future of lower Manhattan. (Regional Plan Association 2001) These include:

- The New York City Infrastructure Task Force

The task force encompasses a coalition of private sector resources charged with informing

and assisting elected leaders and providing professional advice and counsel on the rebuilding process, resource availability, issues of liability and jurisdiction, emergency response procedures, and building codes and procedures. The executive committee comprises Bob Prieto, Chair Parsons Brinkeroff, Marilyn Jordan Taylor, Chair Skidmore, Owings & Merrill, Daniel Tishman, Pres. and CEO of Tishman Construction, and Lou Coletti, Chair and CEO of Building Trades Employers Association.

- New York New Visions

The New York chapter of the American Institute of Architects (AIA) has organized a volunteer action committee to mobilize AIA members to respond to immediate and long-term needs. One hundred and fifty individual architects have volunteered representing sixteen planning and design groups. This committee has released a 52-page document with recommendations for rebuilding as a guide for government. The thrust of the document is towards comprehensive planning, encouraging design excellence and sustainable practices.

- NYC Rebuild

This committee involves cooperation between the NYC Partnership, the Real Estate Board of NYC, the NY Building Congress, the Structural Engineers Association of NY, and the NY Association of Consulting Engineers. The effort has completed an economic analysis and is advancing infrastructure proposals. It represents the interests of major businesses and property owners.

- Rebuild Downtown, Our Town (RDOT)

This is an alliance of downtown residents, small businesses and designers.

- The Empire State Transportation Alliance (ESTA)

A coalition of more than 30 transportation, environmental, and business groups are preparing interim and long-term transportation plans for downtown.

- The Municipal Art Society's Visioning Project

This includes survivors and victims families and has convened public forums to discuss people's visions for the future.

- Lower Manhattan Emergency Preservation Fund

Five historic preservation organizations have donated seed money for preservation needs.

- Civic Alliance to Rebuild Downtown New York

As an umbrella organization, this organization promotes communication and collaboration amongst stakeholders. It was convened by the Regional Plan Association and intends to ensure an open democratic process.

Developer Larry Silverstein controls the development rights and the Port Authority of New York and New Jersey owns the WTC site. Ultimately those two entities must agree upon any development. Mayor at the time, Rudolph Giuliani, in his farewell address said, “I really think we shouldn’t think about this site as a site for economic development. We should think about a soaring, monumental, beautiful memorial that just draws millions of people here that just want to see it. This place has to become a place in which when anybody comes here immediately they’re going to feel the great power and strength and emotion of what it means to be an American.” (Czarnecki 2001, December 28) New Mayor Michael Bloomberg in a press conference release on January 4, 2002, said the site should include a memorial, but would also include a mix of commercial and business development. He added it was unlikely that there will be another 100 story building on the site. (Czarnecki 2002, March 4)

A number of architects and engineers have expressed ideas on rebuilding. The comments have evolved as time has given perspective to the events. Soon after the attack more energies were expended on how to rebuild the WTC just as it had been. Later, that idea seemed less prevalent and less appropriate. Here are a few representative comments offered by leading minds in the field.

- “It would be entirely appropriate to have the Trade Center reproduced at the site. If we turn the site into a memorial, in a way it would be a monument to the success of terrorism.”

-Henry Guthard, Senior Vice President with Minoru Yamasaki & Associates

- “Rebuilding the WTC as it was would be showing nostalgia for a world that doesn’t exist. What has happened with the media coverage shows we don’t need monuments. Buildings no longer carry memory. The media contains the memory. So we need to build again with the understanding that we don’t want to build the same buildings.” -Peter Eisenman, FAIA
- “I hope they rebuild, whether they rebuild that exact structure or not. To turn it into a park does not capture the essence of what New York is. It’s about density and bustling sidewalks and that’s the nature of the city.” –Kenneth T. Jackson, Editor, *The Encyclopedia of New York*
- I don’t know that the twin towers should be rebuilt. Perhaps an even more spectacular skyscraper with its own distinct form would be better. On the other hand, there is much to commend in rebuilding Yamasaki’s building.” –Robert Stern, FAIA
- “Whatever is built on the site will say more about us as a people and how we see our future than about concrete, steel, and glass. The WTC should be redeveloped as a strong symbol of America’s resolve.” –Edward A. Feiner, FAIA, Chief Architect, U.S. General Services Administration
- “I think the process is perhaps more important than what is ultimately done. I think the language of memorialization here is not a distant language of remembrance; it’s an immediate language of engagement.” –Edward Linenthal, Author, *The Unfinished Bombing: Oklahoma City in American Memory*
- “I think that above all, what has to happen here is it has to be exceptional. It has to go from being the third largest downtown in the United States to the most exceptional urban place we can imagine, and at the time its realized, the most exceptional place in the world.” – Marilyn Taylor, Chairman, Skidmore, Owings and Merrill (New York architecture firm)
- Groups representing the victims’ families who consider the site a graveyard are demanding that all 16-acres of the site be devoted to a memorial.

(Architectural Record 2001, Lehrer 2001, Petersen 2002)

II. Design Proposals:

In response to the need for rebuilding at the WTC site, artists and designers have been working overtime-generating designs for anything from quiet parks to contorted skyscrapers and everything in-between. Alex Krieger, Chairman of Harvard University's Department of Urban Planning and Design, says "Thinking of what a memorial should be is a healing process, maybe as much as the final memorial itself, especially since that memorial will be there for future generations, not ourselves. What's really for ourselves is the debate, the discussion." (Fong 2002) The Max Protetch Gallery in New York City displayed a month long exhibit featuring design proposals from more than fifty architects around the world. A sampling of the conceptual design ideas follows. These designs are intended to illustrate the variety of ideas put forth and range from purely functional, to abstract, to purely sacred.



Figure 4.1: Hariri & Hariri

"This New York firm's design replaces the twin buildings with 11 core towers--each between 80 and 100 stories high--that would serve as infrastructure for new tenants, allowing them to integrate their own building concept."

Source: Weekly Dose of Architecture 2002

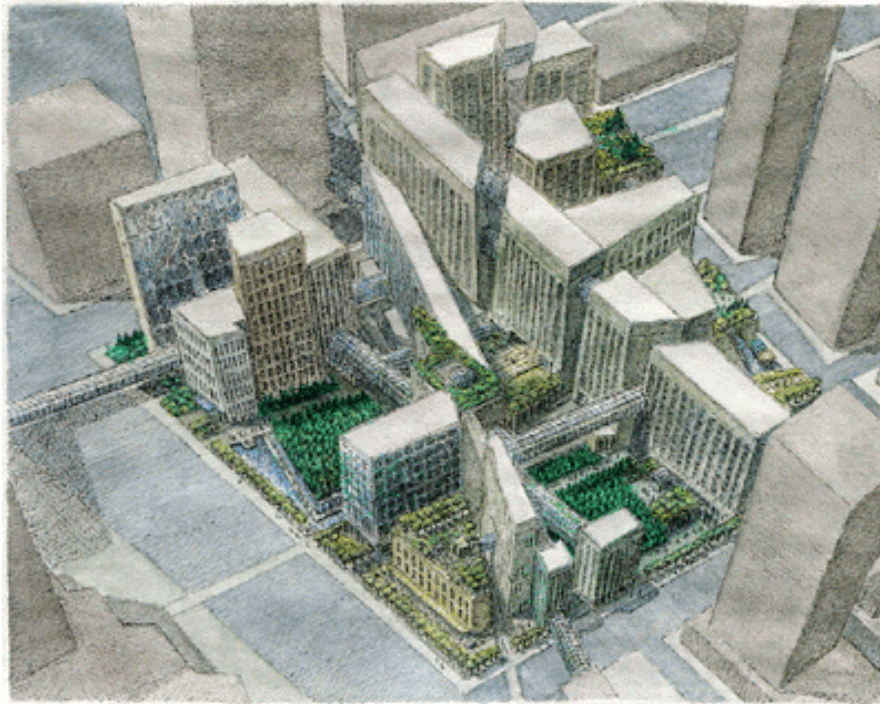


Figure: 4.2: SITE

This design represents a mixed-use development of medium height based on restoring the streets cut off when the WTC was built. Trees are to be planted near the base of the towers as a memorial. Another memorial aspect includes a subterranean moat where the walls would be inscribed with the victims' names.

Source: Hajela 2002



Figure 4.3: Zaha Hadid

“The artist describes her rendition as ‘a city compressed into a large building.’ As abstract as this work appears, gallery owner Max Protetch said he might commission this artist to build the new World Trade Center if the decision were up to him.”

Source: Weekly Dose of Architecture 2002

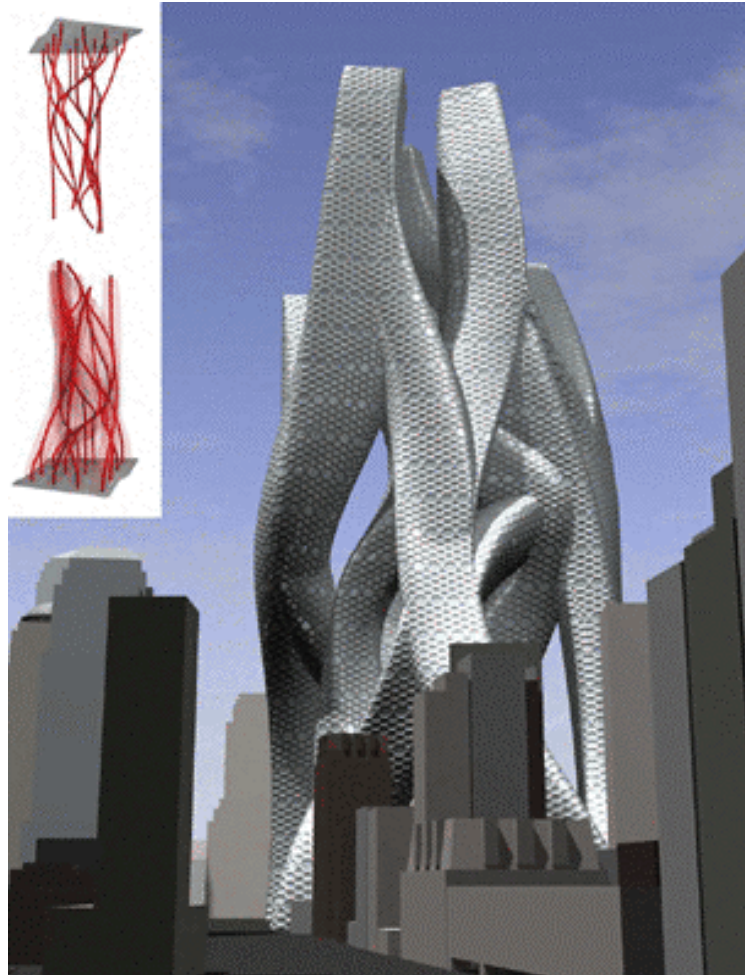


Figure 4.4: Lars Spuybroek (NOX)

“With ‘Oblique WTC,’ it’s best to let the artist explain: ‘Elevators form a highly complex structure of diagonals where at some platforms more than five or six different cores come together to form larger public areas,’ he writes. ‘It is this network of elevators which makes the building not just a new type of tower, but more like a new type of urbanism’.”

Source: Weekly Dose of Architecture 2002



Figure 4.5: Steven Holl with Makram El-Kadi and Ziad Jameleddine
 “In ‘Floating Memorial/Folded Street,’ the space ‘floats’ with river water moving below it. On the way up, strips of sunlight animate the floors and walls. Slots allow oblique views of the Hudson River. Floors contain a restaurant, cafe, classrooms and a hotel. In a memorial hall, each of the tragedy's victims has a photographic portrait and a candle.”
 Source: Weekly Dose of Architecture 2002



Figure 4.6: Raimund Abraham
"Zero Zones' presents three inhabitable buildings, all 880 feet high. Four times a day--timed to the exact minute that the two airplanes hit the towers and that the two towers collapsed--sunlight comes through slats in the buildings as a memorial."
Source: Weekly Dose of Architecture 2002

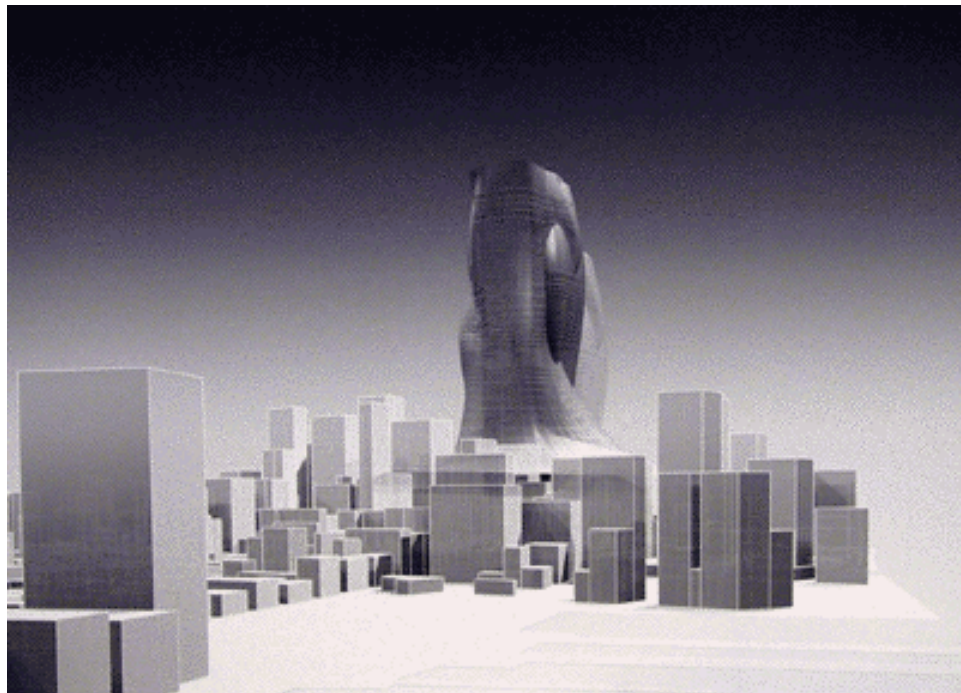


Figure 4.7: Michael Hensel, Kivi Sotamaa, Tuuli Sotamaa, Birger Sevaldson (Ocean North)
“The ‘World Center for Human Concerns’ is designed to provide space for all cultures and people and to serve as a catalyst for exchange based on tolerance. The spaces in the new World Center result from what the artists call ‘the draping and folding of the building skin’.”
Source: Weekly Dose of Architecture 2002



Figure 4.8: Eytan Kaufman Design and Development

“This proposal has two complimentary parts, ‘The World Forum’ and ‘The World Bridge.’ The former is a memorial dedicated to those who lost their lives, and would also contain office space and cultural and commercial activities. ‘The World Bridge’ is an arched structure over the Hudson River connecting New York and New Jersey. No cars would be allowed; instead, it would feature a green park and a pedestrian crossing.”

Source: Weekly Dose of Architecture 2002



Figure 4.9: Samuel Mockbee

“Before the Mississippi architect died at 57 in late December, he drew a proposal from his hospital bed. His idea was for two towers--even taller than the originals--on either side of a vast pit dug into the earth, 911 feet deep that could be reached by a spiraling ramp. At the bottom would be a reflecting pool, a memorial and a cultural center.”

Source: Weekly Dose of Architecture 2002

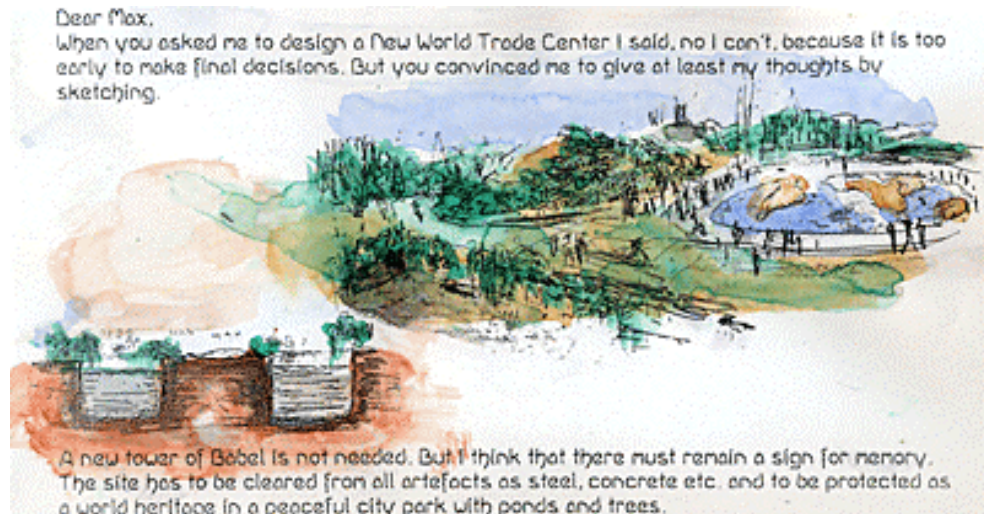


Figure 4.10: Frei Otto

“A new tower of Babylon is not needed. But I think that there must remain a sign for memory. The site has to be cleared from all artifacts as steel, concrete, etc. and to be protected as a world heritage in a peaceful city park with ponds and trees.”

Source: Weekly Dose of Architecture 2002

Although not part of the gallery display, Tadao Ando, an internationally honored Japanese architect proposed a minimalist design. He advocates building an earthen mound that rises 100 ft tall with a 650 ft diameter. The mound would be covered with grass and symbolically serve as the center of the world. He believes “it should be something that stimulates people to think about how they are going to live together on this planet.” (Forgey 2002)

From the above designs it is clear that most of the designers are searching for resolution to the attacks in non-traditional ways. The majority of them express resolution through architecture and create new land uses on site in addition to memorial. There also seems to be general recognition that the site’s future will speak globally about our society. Bridges, mounds, and networks of elevators are symbolically used to connect people and encourage tolerance. Ocean North (Figure 4.7) goes a step further and creates an institution for human concerns to encourage tolerance. This design comes closest to integrating memorial with land use. In this case the memorial is thematically incorporated into the new land use as an active response to the disaster. It successfully presents our new face to the world.

The only lacking element in Ocean North's design is a place for pilgrimage. Local people might work for or participate in the institution as a means of healing, but how will visitors to the site be engaged emotionally? In my own experience traveling to New York, I wanted to see something to verify the reality of the event. There is a danger that without a physical reference to the attack people will forget, in part because the catastrophic nature of the attack is too hard to process. Therefore either the physical manifestation of Ocean North's institution should be a clear reference to memorial or a traditional memorial space should be incorporated into the building. For example, landscape architect, Ken Smith proposed a memorial space honoring the victims on the roof of a building. (Figure 4.11) In his design, glass walls on the roof are etched with the faces of the victims. He said, "in a sense, those people disappeared into the sky, into the emptiness, and this is one way to think about it, to experience the emptiness, see all those faces, and experience the loss." (Riley 2001, p.96)



Figure 4.11: A memorial in the sky, by Ken Smith, New York landscape architect
Source: Riley 2001

The above mentioned designs and exhibition at the Max Protetch Gallery were independent attempts to generate ideas for the future WTC site. However, the Lower Manhattan Redevelopment Corporation is the entity in charge of what will actually happen. Chairman, John Whitehead said, “by June we hope to have a more specific plan for redeveloping the whole area, including the 16-acres where the WTC stood”. (Sanders 2002) He further explained that guidelines for development would be released in mid to late April allowing for a period of public comment and revision before June. Early indications of their plans suggest the WTC site may include a memorial, civic buildings and performing arts spaces, as well as residential, office, and other commercial buildings. The committee is also considering running the West Side Highway between the WTC site and the Hudson River, underground. In addition, designs for rebuilding WTC building No. 7 are nearly finalized. It is unclear how that one building fits into the overall scheme. However, it is interesting to note that the business community is well represented within the Lower Manhattan Redevelopment Corporation while the design community among others is not represented.

CHAPTER 5

SITE ANALYSIS AND DESIGN STRATEGY

The rebuilding of the World Trade Center site must accomplish four major goals. First, it must honor the tragedy and those involved. Second, it needs to draw disenchanted New Yorkers back to Lower Manhattan to work and play and serve as a catalyst for revitalization in the downtown area. Third it must re-establish transportation ties to New Jersey that were cut when the subway and train station below the Trade Center was destroyed. Finally, the development must present a vision for life post September 11. Future use of the site can achieve these goals by combining principles from memorial design and urban design to create a thriving new landscape. Such a thriving landscape will provide active commemoration while re-establishing the urban environment and providing a new American icon for the 21st century.

I. A Memorial Design Problem:

As a memorial, the WTC site needs to address each of the following losses suffered. The most obvious loss is that of the victims' lives. The sheer number of lives lost, 2,936 as of January 3, 2002, is more than this country has witnessed outside war in a single event. (CNN 2002) Pearl Harbor is the closest analogy, but the majority of the people who died in that attack were part of the military. Military personnel are aware of and accept risk to their lives as part of their job on a daily basis. The deaths at the World Trade Center were indiscriminate. These people were ordinary citizens from all walks of life, from homeless to millionaire. In addition, the casualties represented people from 14 countries, 30 citizenships, and 40 states including the Virgin Islands along with 1743 New Yorkers and rescue workers. (September 11 Victims 2001) Like other traditional memorials, the WTC site needs to provide a place for collective remembrance, mourning, and healing for the survivors and loved ones of the victims. This is especially

important since the site itself is both memorial ground and burial ground. Many loved ones have no gravesite to visit because over half of the victims bodies have not been recovered.

The site will, however, be required to reach out to more than just the families and loved ones of the victims, because really everyone in America is a victim. The towers themselves were the tallest in the world for a short time and had remained the tallest in New York City until the attack. For that reason alone they were readily recognizable to people across the country as the prow of the Manhattan skyline. According to the Village Voice the towers were “rock solid: A pair of 1350-ft tall monuments visible on clear days from Bear Mountain in the north to Sandy Hook in the south. They were a guide and a compass for anyone lost in the city. They were a gargantuan presence against which all large things were measured”. (Robbins and Gonnerman 2001) The enormity of the buildings was inescapable. Not only locally, but also regionally people viewed them as part of their everyday surroundings. They became the trademark of New York City based on sheer size.

But the towers were more than just large in physical stature, they were large in symbolic stature. They housed the World Trade Center, a mecca of capitalism and power within our country’s most eminent city. Countless television shows, movies, commercials, and other advertisements featured the WTC towers as symbols of wealth, glamour, and power. The towers had a national audience. “They may be taken to symbolize American exceptionalism, or American capitalism, or even America itself. The World Trade Center is a global symbol, instantly recognized to stand for America, just as the Eiffel Tower or Big Ben stand for their respective countries.” (Gillespie 1999, p. 4) The loss of this national and global symbol of America and what it stands for requires that commemoration address how we as a people respond to this affront. What can be learned and what will we present to the world as our new symbol?

II. An Urban Design Problem:

As an urban design problem the WTC site presents many challenges. The following diagrams and explanations explore the context within which the site lies. Some of the important

issues affecting the strategy for rebuilding at the WTC site include the location and neighborhoods, the downtown land use, the broad downtown circulation patterns, the visual character, and site specific conditions.

A. Location and Neighborhoods:

According to the New York City Planning Office, the WTC site is located in Community District No. 1 (Figure 5.1). This includes the tip of Manhattan south of Canal St. and encompasses the Financial District, TriBeCa, and Chinatown neighborhoods. In 1990, the permanent population of the district was 25,366. The majority of these people, 18,097, are White, non-Hispanic. The minority is composed of generally equal numbers of Blacks (2,502), Hispanics (2,231), and Asians (2,425). The population of the district grew 59.35% between 1980 and 1990. (New York City Planning Department 2000) Landmarks of interest include Battery Park (with views of the Statue of Liberty), the South Street Seaport, the Brooklyn Bridge, the New York Stock Exchange, the Civic Center, City Hall, historic Trinity Church, the headquarters of many of the country's largest banks, and the former World Trade Center.

TriBeCa (Triangle Below Canal Street) is a neighborhood that has been recycled from a manufacturing and warehouse ward to a community of art galleries and restaurants extending from SoHo. Chinatown houses the largest concentration of Asian restaurants, shops, and exotic food stalls in America. The Financial District has historically been the hub of this country's business transactions. However, prior to the building of the World Trade Center, businesses had gradually been relocating in Midtown. Although the trend temporarily slowed when the Trade Center reached its hayday (1980s), in recent years business growth has once again waned downtown. (Gillespie 1999, p.32) Governor George Pataki and former Mayor Rudolph Giuliani have acknowledged the need for revitalization south of Houston Street. (Czarnecki 2001, December 3) This incorporates all of the Financial District, TriBeCa, and Chinatown.

Neighborhoods: Lower Manhattan Community District 1

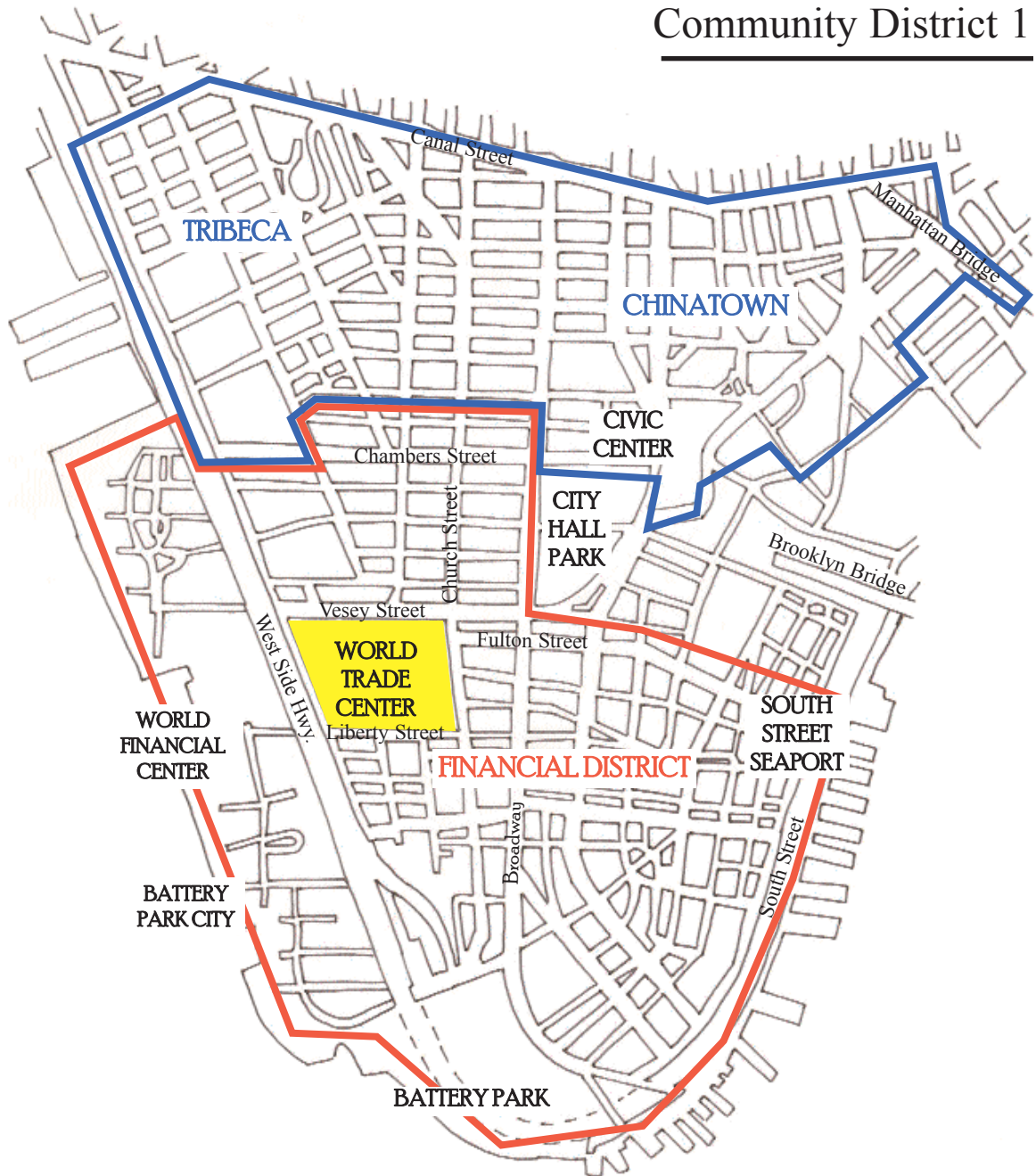


Figure 5.1: Location and Neighborhoods

This figure illustrates the location of the World Trade Center site within Community District No.1. The district includes the tip of Manhattan south of Canal Street and encompasses the Financial District, TriBeCa, and Chinatown neighborhoods. Landmarks of interest include Battery Park (with views to the Statue of Liberty), the South Street Seaport, the Brooklyn Bridge, the New York Stock Exchange, City Hall, historic Trinity Church, the headquarters of many of the world's largest banks, and the former World Trade Center.

B. Land Use:

The Financial District is composed nearly exclusively of commercial development. (Figure 5.2) Five hundred and fifty six of the total 1,496 total lots (including TiBeCa and Chinatown) are occupied by commercial and office space. Public facilities and institutions such as City Hall and the Courts cover 52 lots. Industry and manufacturing, concentrated in TriBeCa, cover 315 lots. Only 455 lots house residential structures and this includes mixed residential and commercial usage. Purely residential structures account for 187 lots or 4% of the total area in the district. (New York City Planning Department 2000) Any revitalization plan for the district should concentrate not only on business growth, but also community and residential development.

C. Broad Circulation Patterns:

Circulation routes in and around Lower Manhattan are well established. (Figure 5.3) On the east side two bridges and a tunnel connect the tip of Manhattan to Brooklyn. On the west side the Holland Tunnel shuttles vehicular traffic to and from New Jersey at Canal Street. The subterranean PATH trains, now destroyed, connected the World Trade Center directly to New Jersey. Numerous ferries cross the East and Hudson rivers transporting tourist and commuters alike. Two major US routes skirt the outer edges of the Lower Manhattan peninsula while smaller local streets cross the interior in grid-like fashion. A thriving business district depends on good connection with surrounding areas. It will be important to re-establish commuter train access to the Financial District from New Jersey.

D. Visual Character:

Two collections of skyscrapers, one in Midtown and one downtown accent the Manhattan skyline. Downtown, eighty-three skyscrapers were built between 1896 and 1983. (Figure 5.4) These buildings had an average, 35 floors and 850,000 ft² of usable space. The World Trade Center towers were by far the tallest, but the remaining tallest buildings range from 70 to 80

Land Use: Lower Manhattan Community District 1

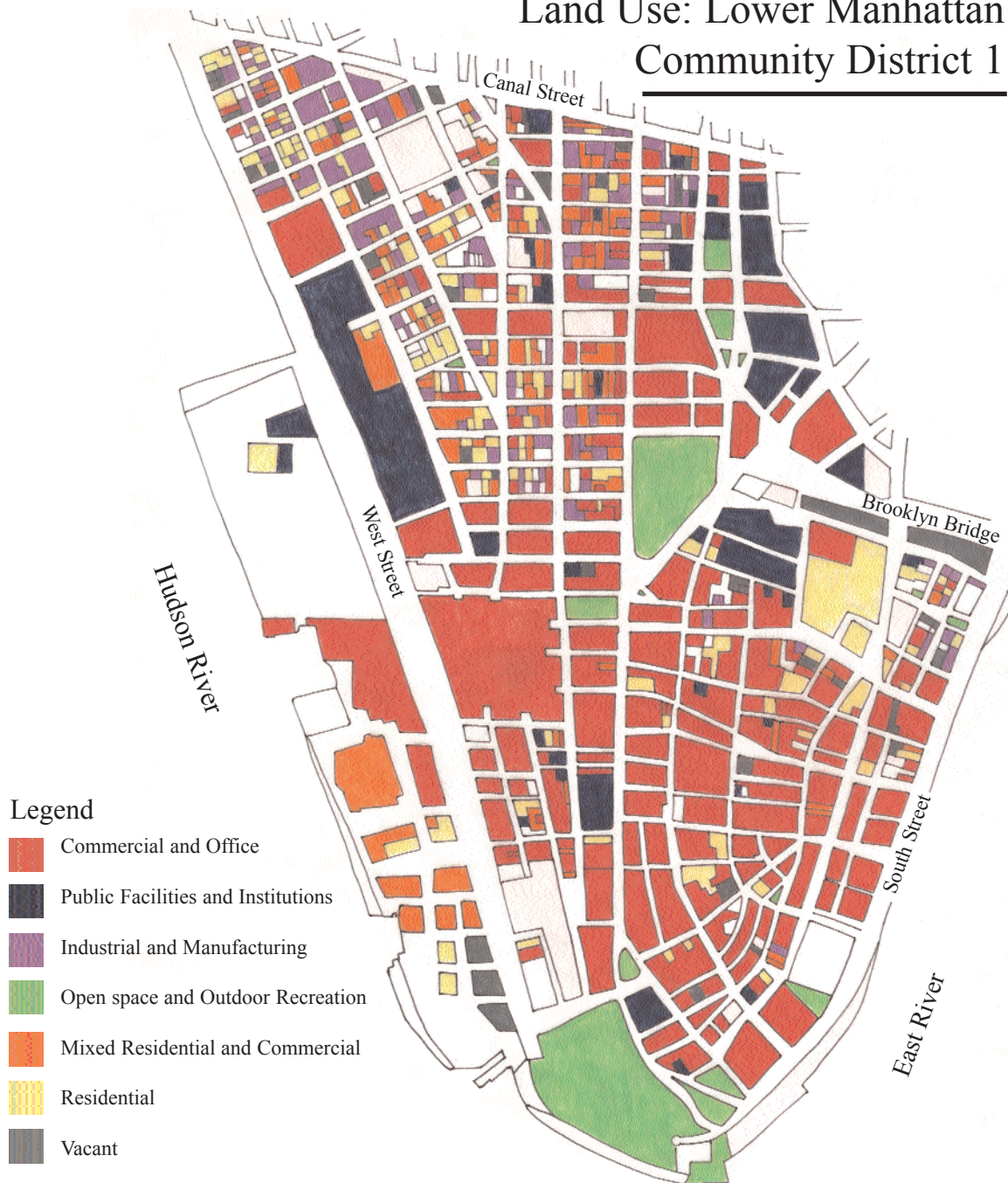


Figure 5.2: Land Use

This figure illustrates the distribution of land uses throughout Community District No.1. Notice the nearly exclusive nature of commercial development within the Financial District. Five hundred and fifty six of the total 1,496 total lots (including TriBeCa and Chinatown) are occupied by commercial and office space. Public facilities and institutions cover 52 lots. Industry and manufacturing, concentrated in TriBeCa, cover 315 lots. Only 455 lots house residential structures and this includes mixed residential and commercial usage. Purely residential structures account for 187 lots and 4% of the total area in the district. (<http://www.nyc.gov/html/dcp/html/mn1lu.html>) Any revitalization plan for the district should concentrate not only on business growth, but also community and residential development.

Circulation: Lower Manhattan Community District 1

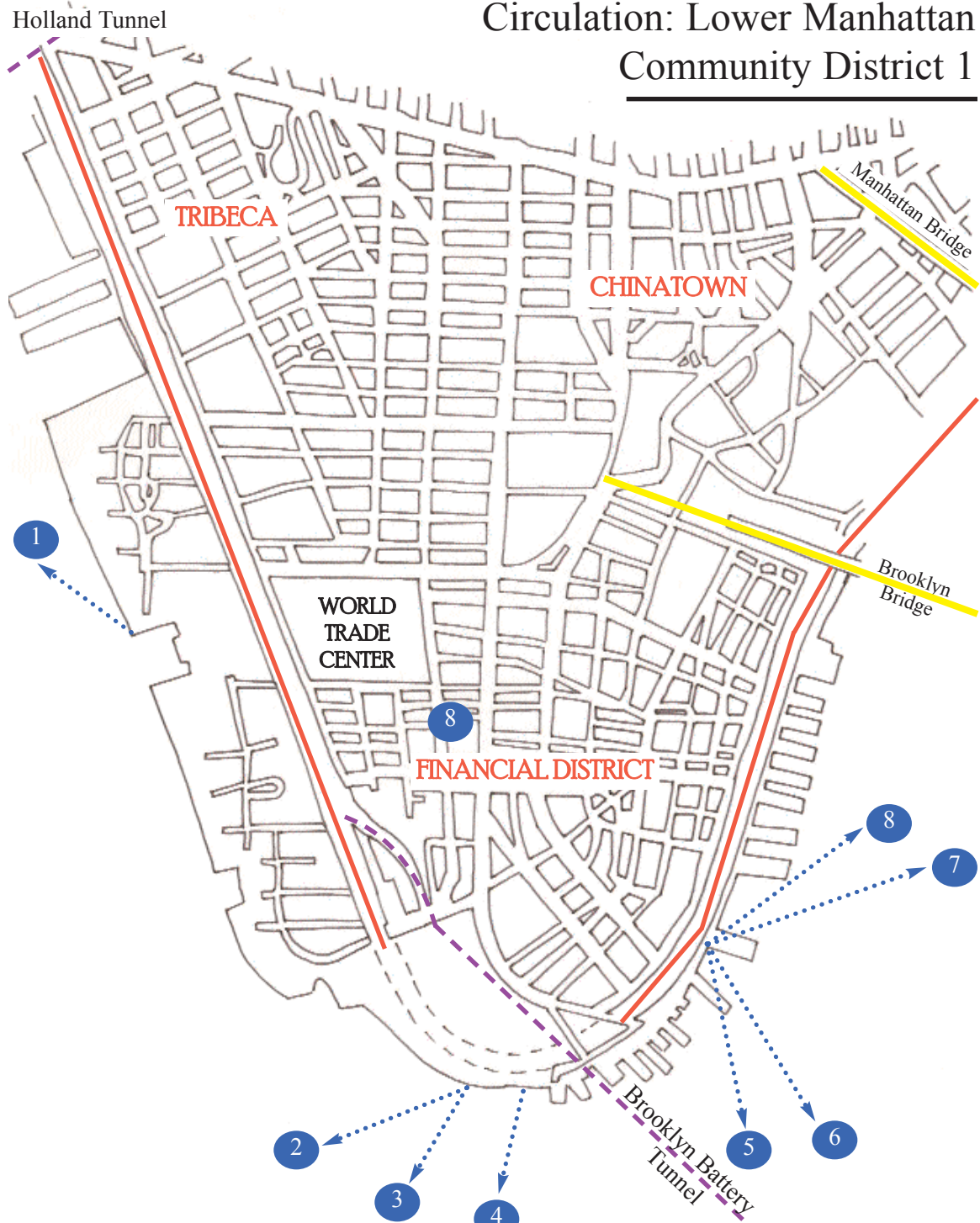


Figure 5.3: Circulation Routes

This figure illustrates the major circulation routes through Lower Manhattan.

—	Arterials	1 Hoboken NJ	5 Atlantic Highlands, NJ
—	Bridges	2 Ellis Island	6 Brooklyn Army Terminal
⋯	Ferries	3 Statue of Liberty	7 Shea Stadium (Seasonal)
---	Tunnels	4 St. George, Staten Island	8 Yankee Stadium (Seasonal)



Figure: 5.4: Lower Manhattan skyline
 Source: <http://www.photolib.noaa.gov/corps/corp2238.htm>

floors. Although taller buildings generally have more space, many of the 30-50 story buildings gain floor space with larger footprints. For example, One New York Plaza developed by John P. McGrath, Esq., has 50 floors and 2,540,000 ft² of usable space. That translates into a 225 ft by 225 ft footprint. The WTC towers were 200 ft by 200 ft. The majority of the tall buildings downtown are concentrated in the Financial District. Building size drops dramatically in TriBeCa and Chinatown where 4-6 story buildings are common. (Figure 5.5) The height to width ratio greatly affects the character of linear spaces. In New York's Financial District the streets are narrow and the buildings are tall. According to Raymond Curran if the height to width ratio experienced by a pedestrian in the street is greater than 2 to 1, feelings of claustrophobia often ensue. This in part results from the fact that the vertical perspective produces an illusion of buildings closing in overhead. (Curran 1983, p.76) In the Financial District the shape of the peninsula and the proximity of open water may mitigate these feelings. The juxtaposition of densely packed new and old, small and large buildings creates a visual variety that is uniquely New York. (Figure 5.6)

Building Mass: Lower Manhattan Community District 1

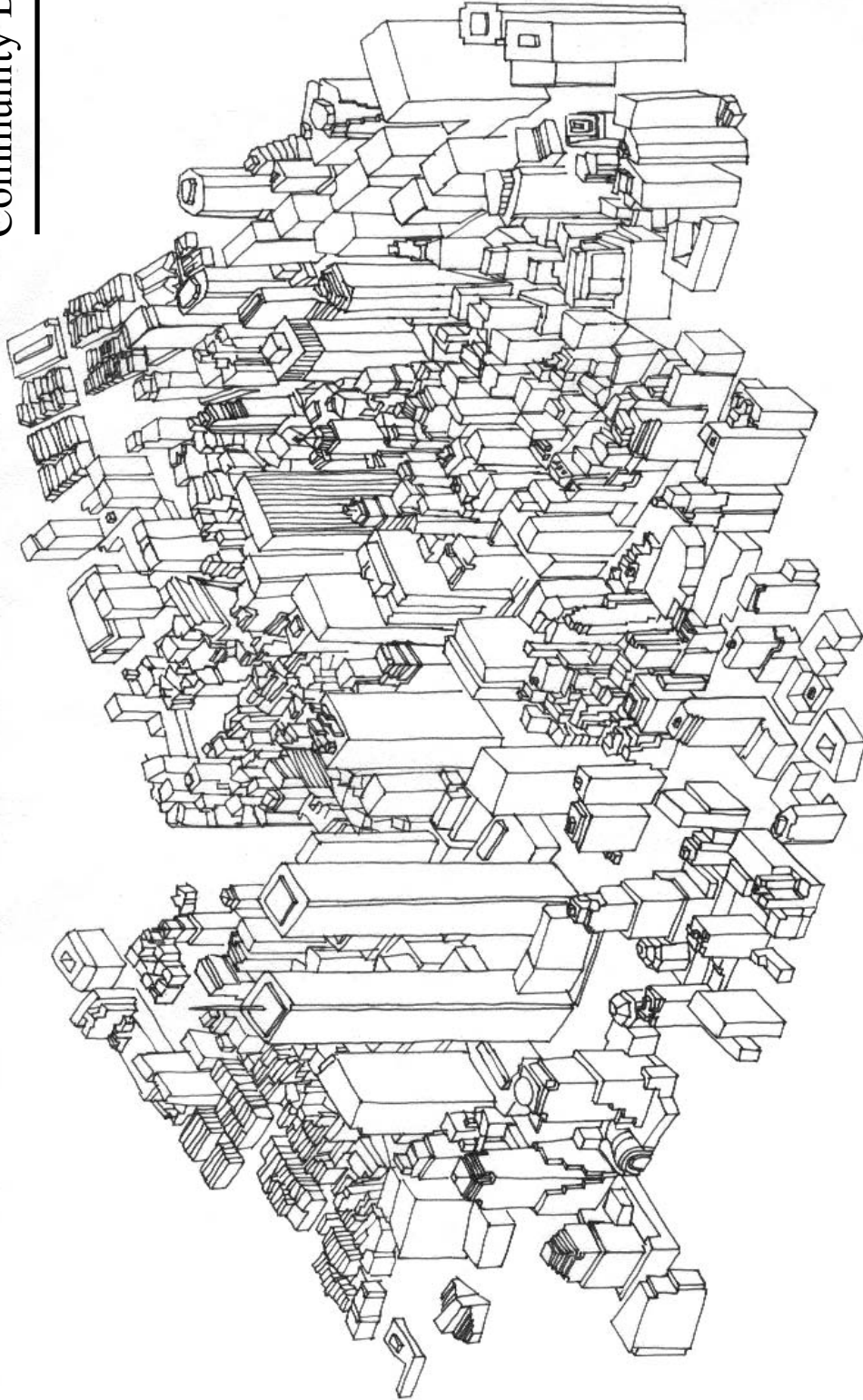


Figure 5.5: Axonometric

This figure illustrates the massing, height, and general articulation of buildings on the Lower Manhattan Peninsula.

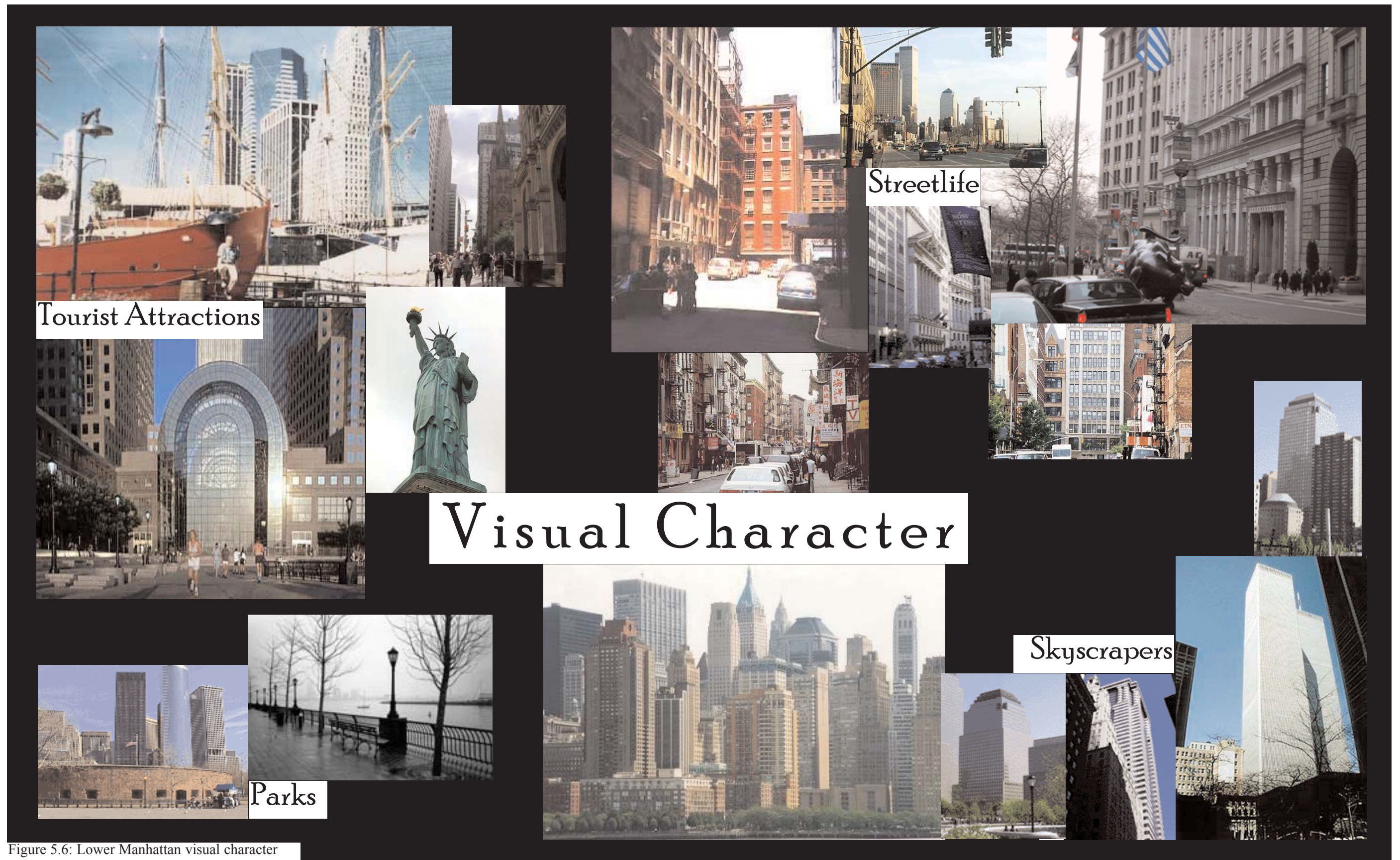


Figure 5.6: Lower Manhattan visual character

E. Site Considerations:

The World Trade Center site is quite large encompassing 16-acres in the Financial District. It abuts the World Financial Center and the Hudson River on its west side. The World Financial Center houses American Express, Lehman Brothers and Merrill Lynch, but was substantially damaged by the attack. These companies are currently operating elsewhere. For example Lehman Brothers has temporarily moved to Jersey City. Directly east of the site was a thriving discount retail community. Crippled by the attacks, it includes the locally famous Century 21 clothing store. It is critical to ensure the viability of these cornerstone businesses, large and small, when the area is rebuilt.

The WTC site is currently being cleared of debris in hopes of finding un-recovered victims and in preparation for rebuilding. The Port Authority has worked 12-hour shifts for over six months in this endeavor. On November 4, 2001, the site was officially considered a construction site rather than a recovery operation. This changed the operation drastically and allowed large machinery to clear the debris more quickly. All materials from the site are being transported to Fresh Kills Landfill on Staten Island where subsequent recovery operations sift through the remains for personal items. The site is scheduled to be clear in early June of 2002, at which time it will presumably have no physical limitations for building.

III. Critical Elements of Design:

The debate over what and how to rebuild will present many challenges. For my thesis, however, the goal of rebuilding should focus on integrating memorial with new use on site. The references to commemoration established in Chapter 3, and the history of the site, suggest four elements that would preserve the memory of this tragic event while embedding it in new use. Each of these elements, the height of the buildings, the architecture, the local circulation patterns, and the activities that become part of the new land use, have the opportunity to communicate what happened there while communicating a new landscape for the future.

A. Height:

The sheer size of the two towers at the WTC made them an engineering feat, but also made them internationally recognizable. They became a target for terrorism in part because of their recognizable height. Verticality or some reference to verticality in the future design of the site would visually sustain the memory of size.

In light of the collapse of two 110-story buildings, however, and the phenomenal loss of life associated with it, are skyscrapers a viable and safe building method for the future? According to Jon Magnusson, CEO of Skilling Engineering, the Twin Towers fared pretty well, “99% of all buildings would have collapsed immediately had they been hit by a Boeing 767. The size of the Twin Towers and the redundancy inherent in the perimeter structural tube allowed these buildings to stand longer, giving people more time to escape”. The reality is that “one might be able to improve means of egress and the life safety systems of a super tall building, but you can’t harden these buildings to take that kind of impact. Perhaps the greater focus should be on preventing intentional attempts at destroying skyscrapers.” (Post 2002) While architects and engineers have opinions, developers will make the ultimate decisions about height. John Harris, Executive Vice President of Heines Interests, a Houston-based developer, says the decision to build tall is tenant driven. He further asserts that tenants the world over have not cowered in light of the WTC attacks. (Post 2002) The tall building remains a fundamental component of dealing with density, and it will continue to be.

But even if super tall buildings are viable, is it appropriate to build them on the WTC site? This may be an unanswerable question. On the one hand, since the attack, the city of New York has been missing the dominant part of its skyline. If rebuilding on the site does not incorporate tall buildings, the site may well still become a new symbol of New York and the country. However, without re-establishing the skyline the regional visual appeal will be lost. On the other hand, people working may be psychologically wary of safety in a tall building on this site even if they have no fear elsewhere.

If tall buildings are planned on site, two questions become important. How will the new building or buildings fit into the existing skyline, and should they be occupied or unoccupied? First, there is a general rhythm to the skyline of Manhattan where crescendo follows decrescendo. (Figure 5.7)



Figure 5.7: Ebb and flow of building heights within the Manhattan skyline.
Source: <http://www.njguy.com/photo.htm>

Few exceptions break this pattern, but among them were the Trade Center towers. These two towers were so much larger than anything around them that they constituted spikes or anomalies in the rhythm. (Figure 5.8)

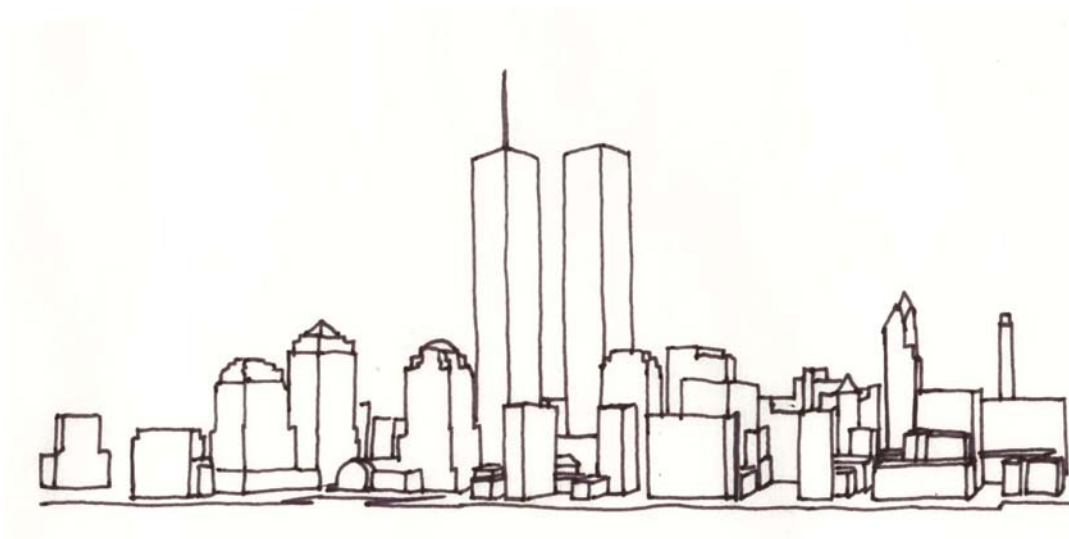


Figure 5.8: Skyline of area surrounding and including the WTC Towers.

There is the possibility on site of preserving the memory of the towers by recreating anomalies in the skyline. In that case a super tall building or buildings would again dwarf the surroundings. However, the memory of height on site could more appropriately be re-established within the rhythm of the skyline. (Figure 5.9 and 5.10)



Figure 5.9: Skyline of area surrounding the WTC without the towers.



Figure 5.10: New buildings on WTC site that re-establish the rhythm of the skyline.

The site is large enough to accommodate a number of buildings that match the neighborhood in scale at the edges of the site, but gradually increase in height toward the center. In this manner a super tall building is set amidst other tall buildings instead of by itself.

Since size was partly responsible for the downfall of the WTC, should any new tall buildings be occupied? The term occupied here means frequented on a daily basis by a large number of people for work. Is there a safety concern or a perceived safety concern working in a super tall building on site in the future? With time this would probably not be a concern, but perhaps there is a compromise. If a group of buildings are placed on site as mentioned above, the

supporting buildings might house a mixture of uses including office space, while the tallest one might be entirely different. For example, the tallest structure could be an observatory/memorial space. One major attraction of the WTC towers was the observation deck and the perspective of the city it afforded. By building an observatory we preserve that memory. At the same time we create an opportunity for pilgrimage. The symbolic nature of traveling into the sky to view a memorial for victims could be a powerful gesture as suggested by Ken Smith's memorial in the sky. Going a step further, the elevator and sky lobby system of the original towers might serve to organize memorial space and provide a more symbolic journey.

If tall buildings are not part of the future design, the memory of height can be preserved through reference. For example, a temporary memorial was installed at the site on March 11, the six-month anniversary of the attacks. Designed by a group of architects, artists, and lighting designers, it consists of two beams of light just north of Ground Zero that shine into the night sky in the shape of the towers. The purpose is to "honor those lost on September 11, and to celebrate the spirit of all the New Yorkers who have worked to rebuild and renew the city." (Creative Time Inc. 2001) The lights provide a symbolic reminder of what was once there without building anything. Another design proposal that references the height of the towers suggests building two tower-length piers extending into the Hudson River. Fred Bernstein presents this idea as a functional pier space as well as a memorial. This may not be an appropriate proposal, however the height reference is relevant. (Gotham Gazette 2002, February 14) Regardless, height is a critical element for incorporating memorial into the future landscape.

B. Architecture:

Following World War II, Budapest chose to commemorate the devastation suffered there by revealing and incorporating the ruins of old buildings in the new architecture. Although reference to a historic building can be incorporated into a new building using a similar façade design, the actual ruin provides a tangible link to the past.

Most of the World Trade Center buildings were reduced to an unrecognizable mass as a result of the disaster and the recovery effort. However, a portion of the exterior wall of the South Tower remained standing. (Figure 5.11) This portion of wall has been removed from the site to facilitate the clean up, but has been kept intact. With its steel gothic arches, the wall is a powerful reminder of both the strength and fragility of our society. It could easily be incorporated into another structure on site and remain as a memorial and lesson to future generations. All new architecture on the site should draw inspiration from and complement the visual character of the surrounding area. Using architecture currently in existence in Lower Manhattan, Figure 5.12 shows how the ruin of the south wall might become part of a new building.



Figure 5.11: View of still standing portion of South Tower wall

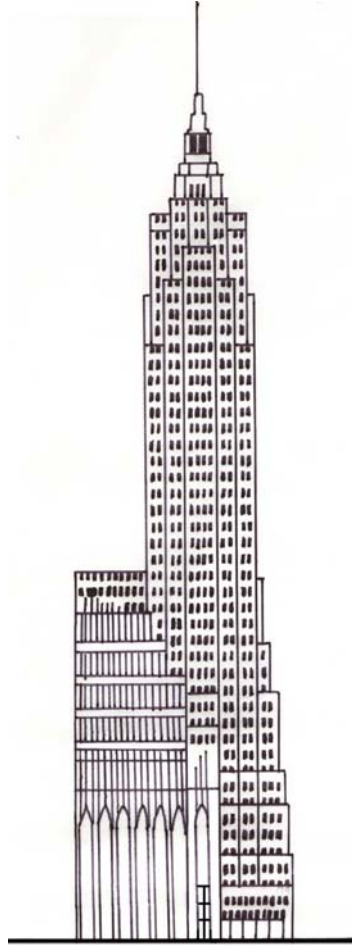


Figure 5.12: Example of local architecture with the remaining portion of the South Tower wall incorporated into the left side of the façade.

C. Local Circulation and Footprints:

A number of cities in Europe preserved circulation patterns as a means of remembrance when rebuilding after World War II. Moving in historical patterns creates the possibility of experiencing the past through ritual. The WTC produced an oversized block superimposed on the underlying grid of Lower Manhattan. It completely ignored the surrounding neighborhood and focused on internal pedestrian circulation through a raised plaza and maze of underground tunnels. The enormous nature of the WTC buildings also ignored the scale and footprints of adjacent buildings. In essence, no memory was preserved during the creation of the WTC.

Therefore the future design of the site has at least two opposing circulation patterns to consider when preserving memory, the plaza and footprints of the WTC complex, and the underlying city grid. In both cases the broader circulation concerns of reconnecting the site with New Jersey could be accommodated below ground with re-established train routes.

1. Spatial organization based on World Trade Center:

First, the original building footprints and plaza of the WTC can be used as a basis for the design of future circulation and spatial organization on site. (Figure 5.13)

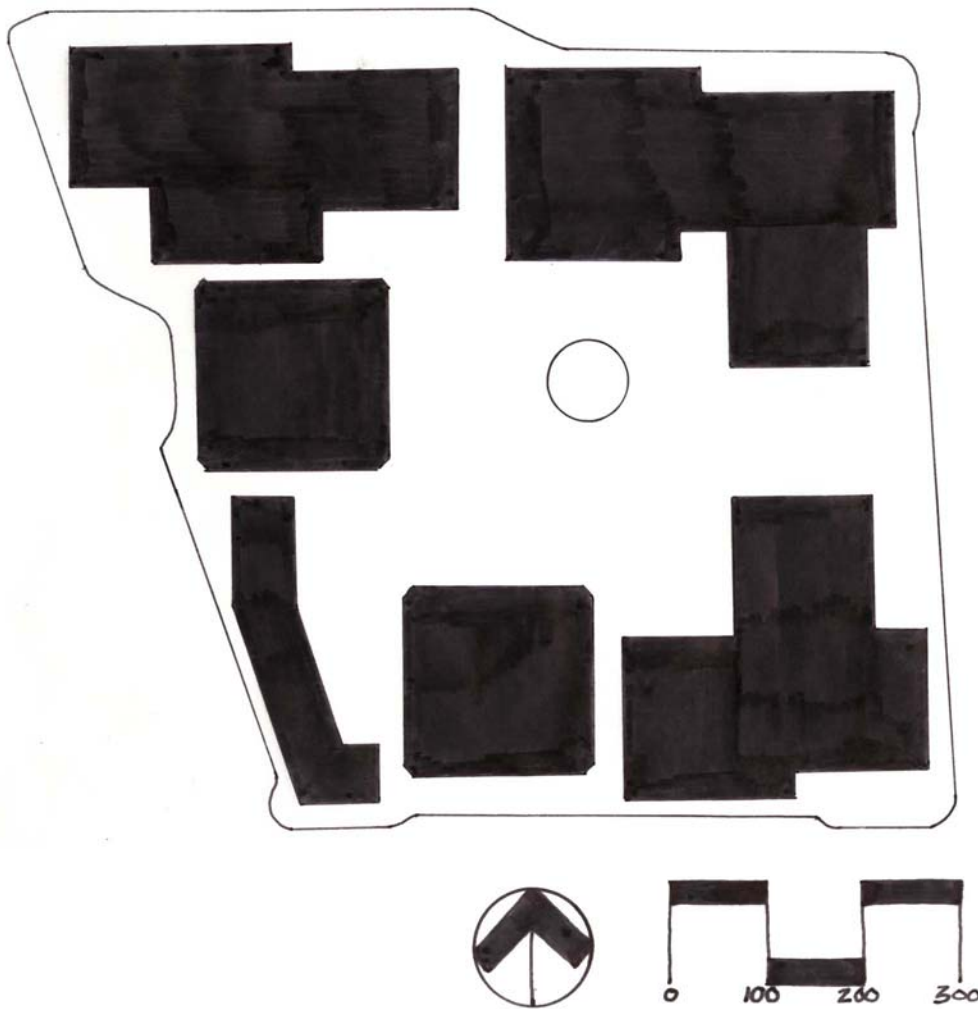


Figure 5.13: Figure ground showing building placement and resulting plaza space at the former World Trade Center. All following site diagrams have same orientation and scale.

This plaza and open space of the former WTC was originally modeled after Piazza San Marco in Venice, Italy. (Gillespie 1999, p.168-69) (Figure 5.14)

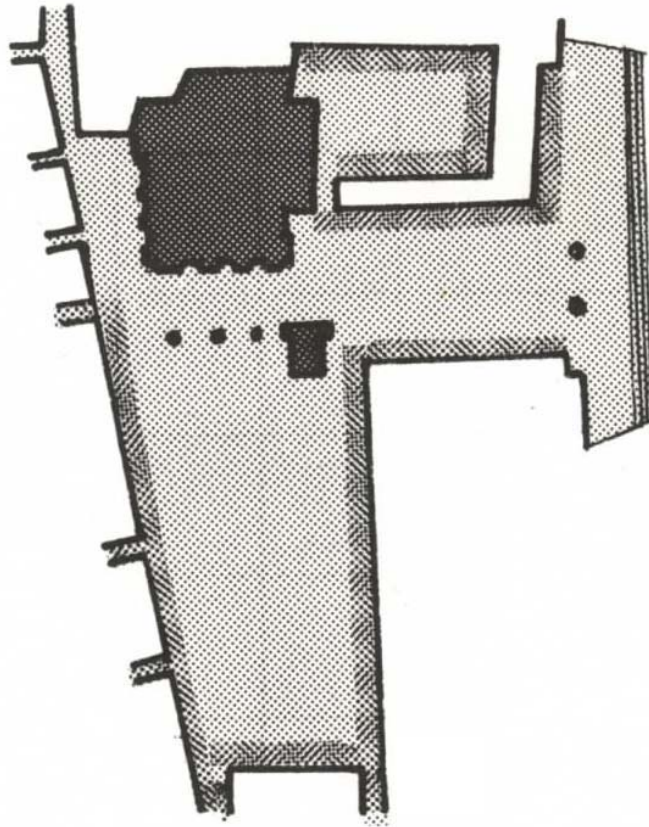


Figure 5.14: Plan of the Piazza San Marco, Venice Italy
Source: Curran 1983.

Piazza San Marco is an L shaped plaza that opens on one side to the mouth of the Grand Canal. Densely packed three to five story gothic buildings with arcade-like facades form the boundary on the other sides. The main visual attraction is the ornate Basilica of Saint Mark at the corner of the plaza. The plaza itself is completely hardscaped and is punctuated by a freestanding bell tower (the Campanile) and a few columns. (Figure 5.15) Although the plaza covers a generous 4.4 acres, it is completely pedestrian, vibrant and surprisingly intimate.

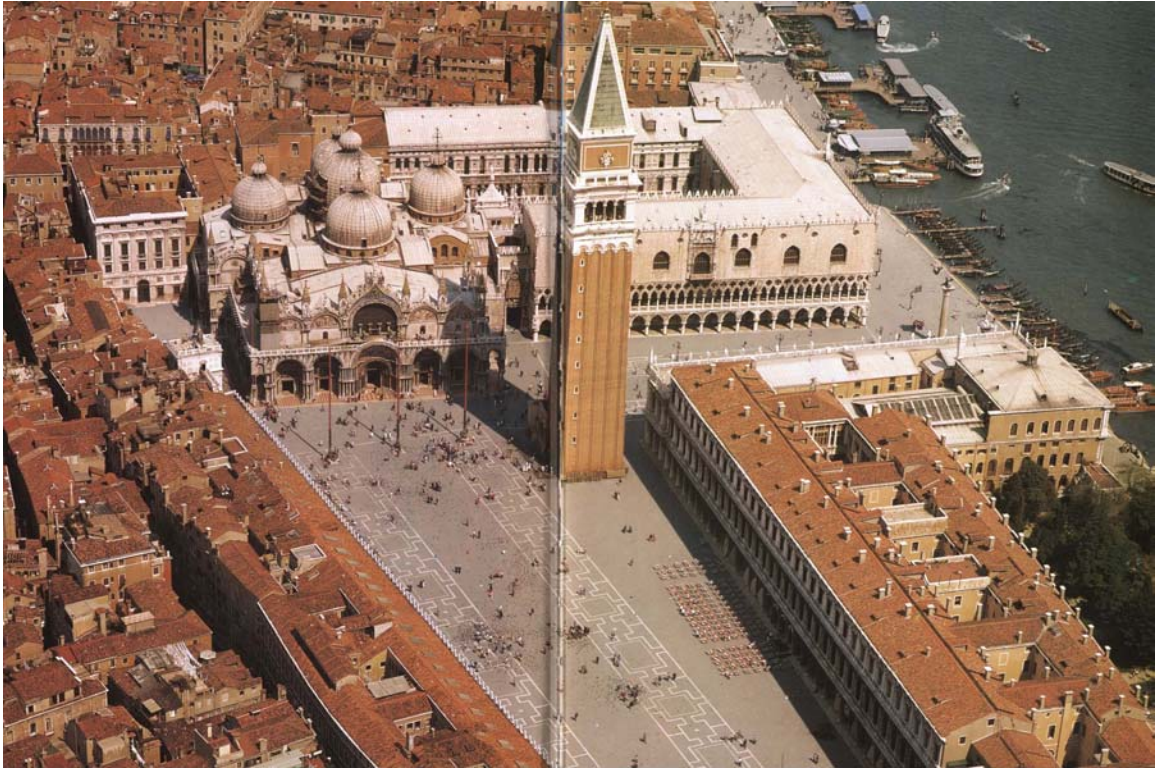


Figure 5.15: View of Piazza San Marco, Venice Italy
Source: Maria Da Villa Urbani, *The Basilica of St. Mark*, 2000

Tobin Plaza at the WTC never achieved its goal of emulating Piazza San Marco. Although completely pedestrian, hardscaped, and bounded on two sides by buildings with gothic references, Tobin Plaza had little else in common with the famous plaza in Italy. According to Raymond Curran, in *Architecture and the Urban Experience*, “in addition to the distinct feelings of insecurity experienced by many people standing at the base of 110-story towers, the otherwise well-defined space was immense in scale”. (Curran 1983, p.182) The plaza actually encompassed 5 acres potentially fitting eight football fields within it. Size alone is not necessarily a problem. The uninviting nature of this space, however, was compounded by a lack of activity within the massive lobbies of adjacent buildings and a weakness in linkage to the surrounding city. The commercial activities were located beneath the plaza deck and out of sight. As a result, Tobin Plaza quickly became a “dead” space, unpopulated and wind swept unless special events were scheduled.

In order to use this plaza as an organizing tool and method of preserving memory perhaps we should revisit Piazza San Marco and design the future site based on what Tobin Plaza was intended to be rather than what it became. The following figures show how mass and open space can begin to take shape while maintaining the general layout and circulation patterns that characterized the WTC. Height is not addressed in these diagrams, but would be important in defining the feel of the open space.

Figure 5.16 illustrates how the footprint pattern of the WTC buildings can be used to create a balance of open and enclosed space. Since Tobin Plaza was immense in scale, this diagram maintains the general footprint pattern of the former buildings, but scales down the size

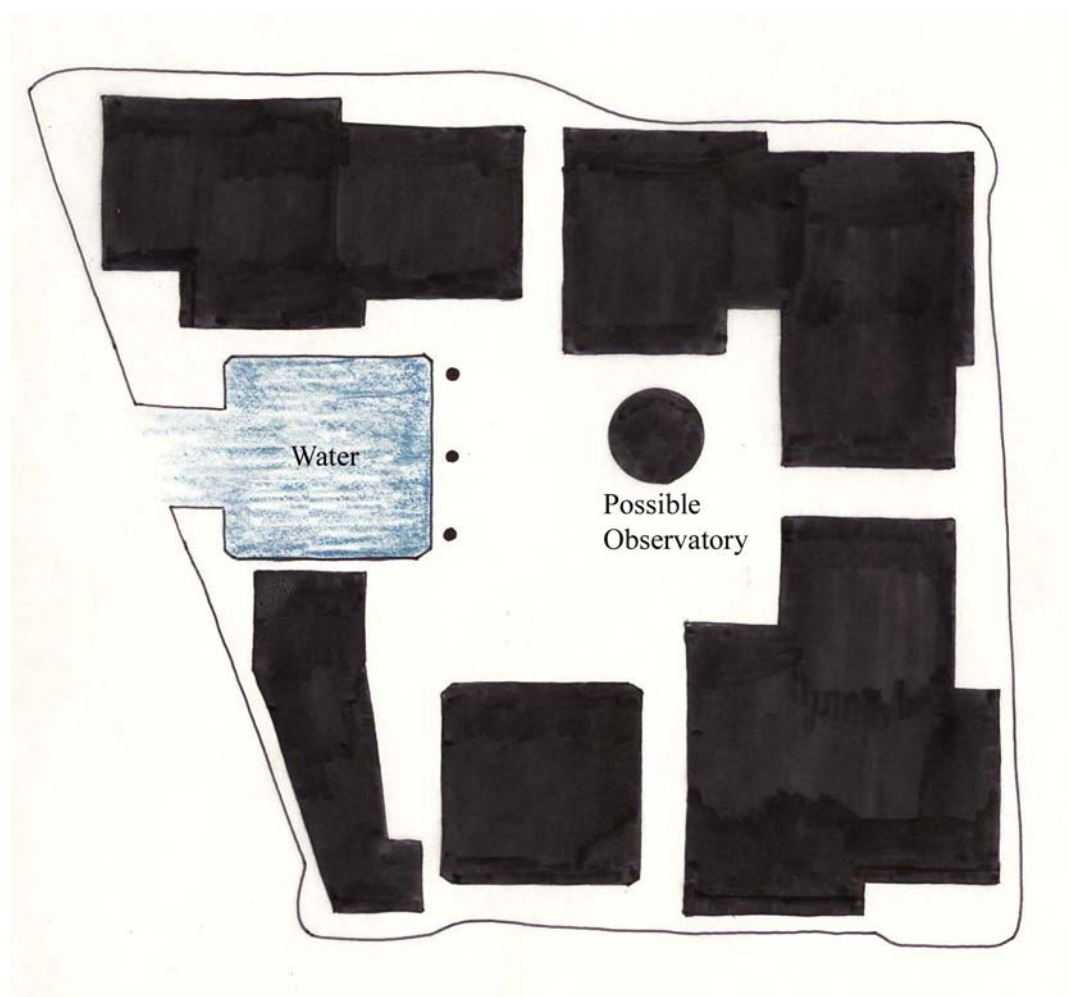


Figure 5.16: Mass and open space design based on WTC footprints.

of the plaza. According to Christopher Alexander, “for any collection of buildings, decide which building in the group houses the most essential function—which building is the soul of the group, as a human institution. Then form this building as the main building with a central position and higher roof.” (Alexander 1977, p.487) In the case of Piazza San Marco this building is the basilica. At the WTC site that building might be situated where the South Tower existed. There is also the possibility of incorporating a portion of the ruin within the new building as mentioned above to signify its importance as the main building. Aside from the main building, Piazza San Marco has two additional defining elements. First, the proximity of water provides an open-ended view and emphasizes the importance of connection to the rest of the city. The design for the WTC site could consider bringing the edge of the Hudson River into the plaza to mitigate any feeling of insecurity created by height and to establish a connection to the larger area. Figure 5.16 shows water from the river bathing the site of the North Tower. The final defining element at Piazza San Marco is the tower placed within the plaza itself. It is not overpowering, but serves to break up the expanse of plaza. The observatory idea mentioned previously might serve as this element at the WTC site.

Once simple organization of mass and open space is defined, articulation of actual buildings along the plaza faces can further define the space. (Figure 5.17) This articulation would also provide more intimate alcoves embedded in the larger plaza. All new buildings should reflect building sizes in the neighboring area to strengthen connection between the site and its surroundings. Using the WTC footprints, plaza, and resulting local pedestrian circulation patterns, it is possible to preserve the memory of organization and movement on the site while designing new buildings and uses.

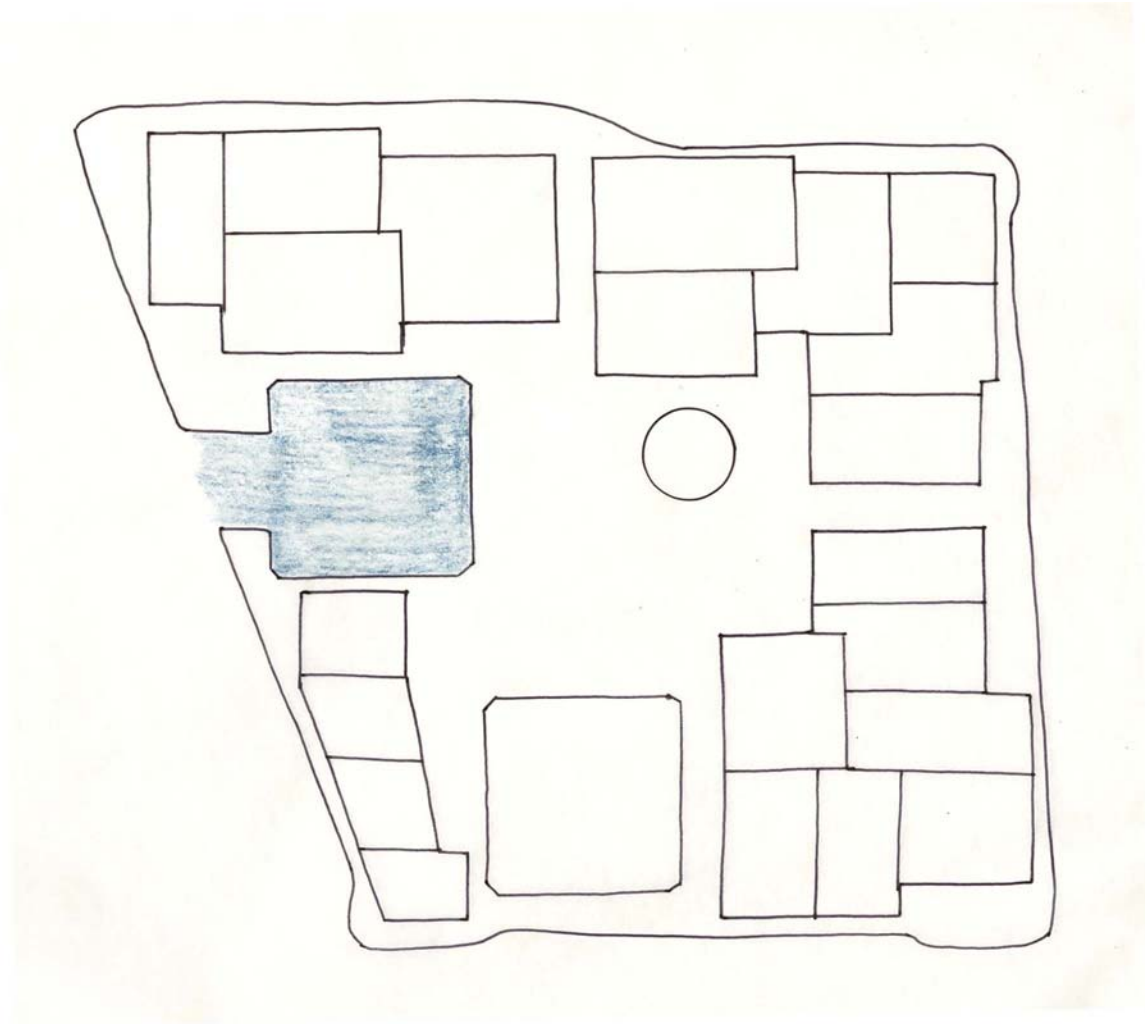


Figure 5.17: Possible articulation of buildings based on mass and open space plan in Figure 5.16.

2. Spatial organization based on city grid:

Rather than use the World Trade Center spatial organization, memory could be preserved using an earlier layer of the city's history by re-establishing the city grid. There are strong connections to the city produced by re-establishing the lost portion of the Lower Manhattan grid that existed for years before the WTC. (Figure 5.18) An exhibit at the Protetch Gallery by SITE (Figure 4.2) chose to use this reference as a basis for their design proposal. Loosely basing design on the underlying city grid, it is possible to create a central pedestrian open space (like the WTC provided) on site while reconnecting vehicular ties with the surrounding area.

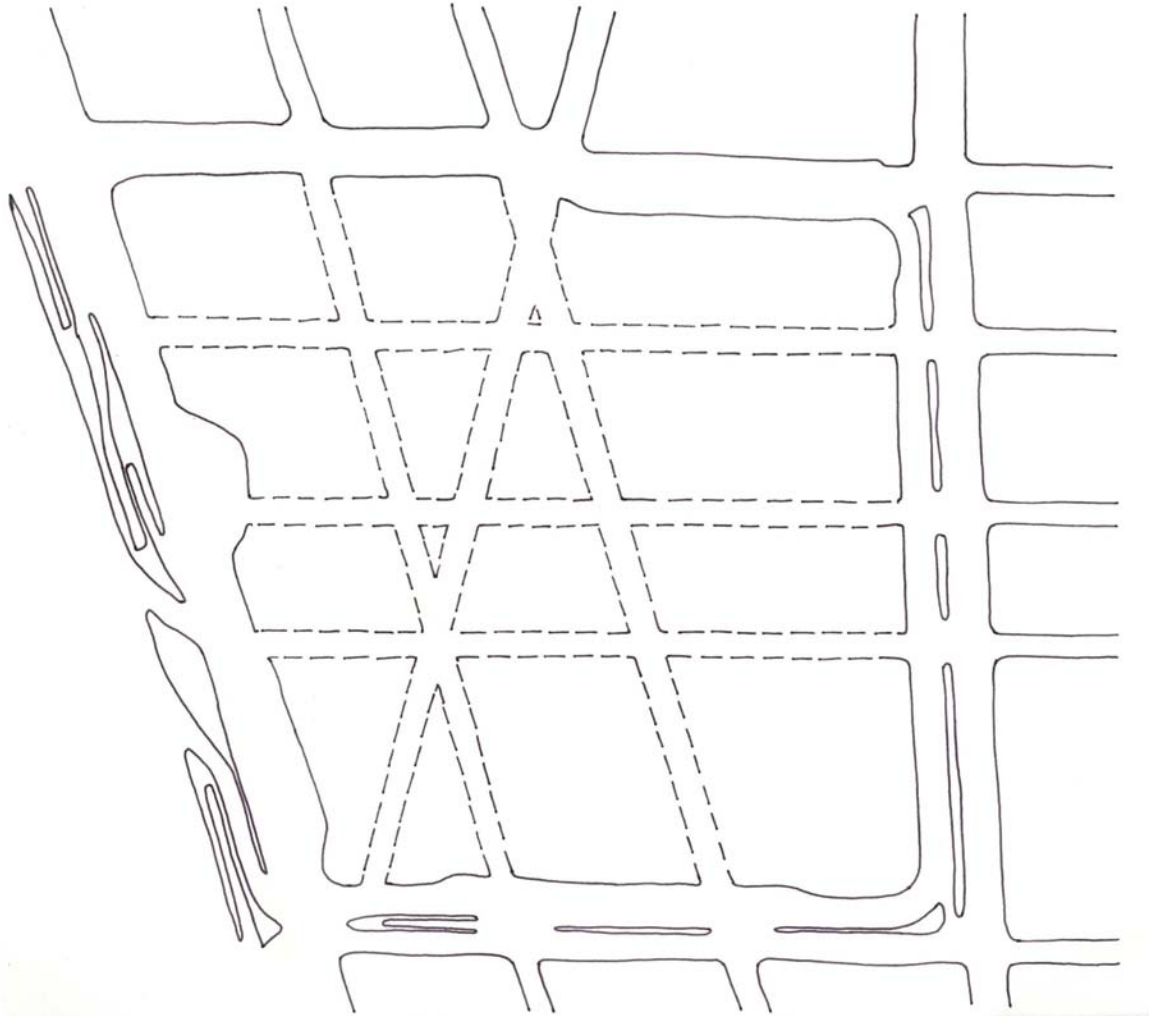


Figure 5.18: The pattern created on the WTC site if the underlying city grid is re-established.

Figure 5.19 illustrates how the organization of mass and space might take shape in plan view still using the idea of building a group of buildings culminating in height near the center. Again, the articulation of buildings would further define the space.

In this scenario remembrance of the WTC can still be interjected. Again, the main building on site might incorporate ruins from the disaster. In addition, to announce your entrance to the site and to overlay the WTC memory on top of the grid, perhaps the paving pattern in the

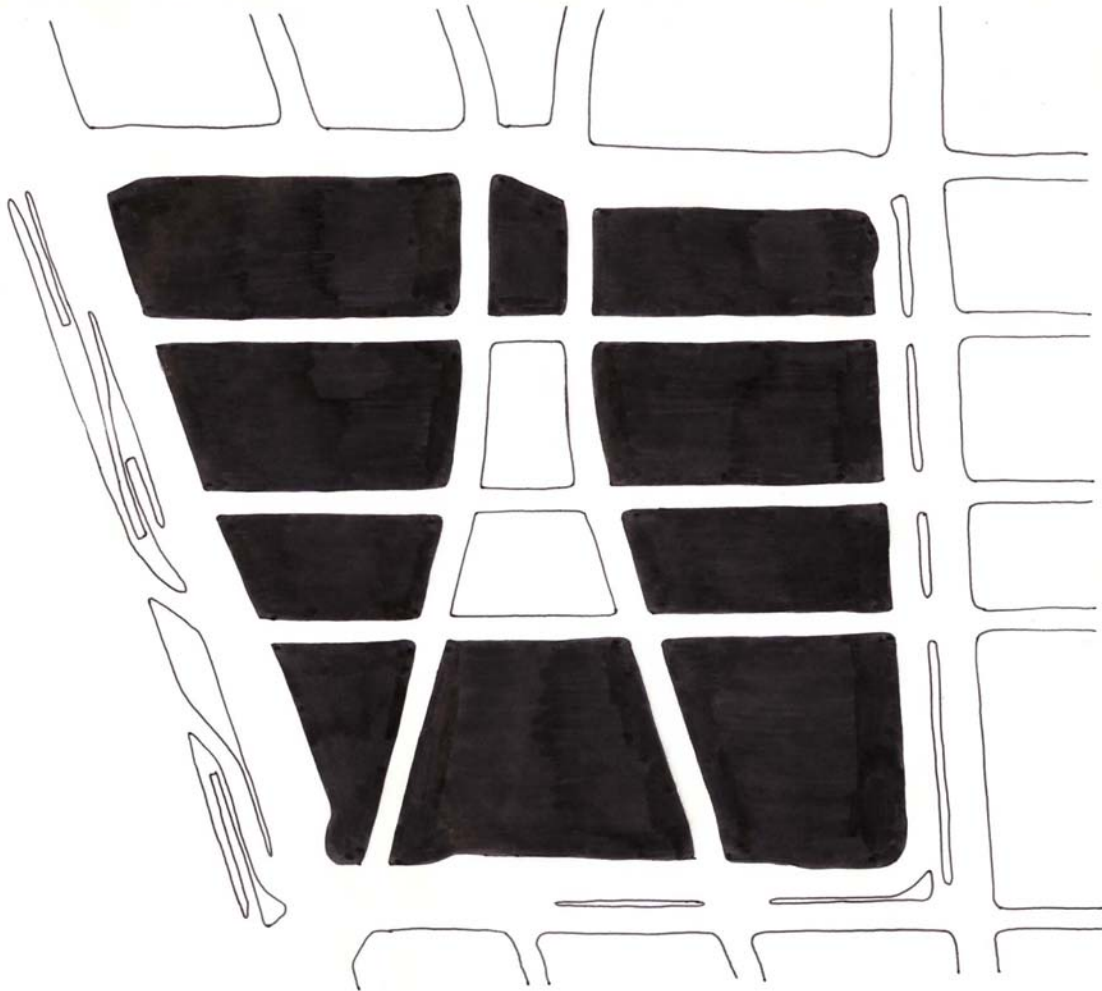


Figure 5.19: Possibilities for mass and open space based on the re-establishment of the city grid on the WTC site.

street could change within the 16-acre site. Another possibility could reference the footprints of the WTC buildings with a different paving pattern or ground plane treatment. In that case a palimpsest would emerge. The old city grid would be re-established, the WTC memory would be preserved where glimpses of the footprints were visible, and finally the present would be incorporated in the new pattern of buildings. (Figure 5.20)

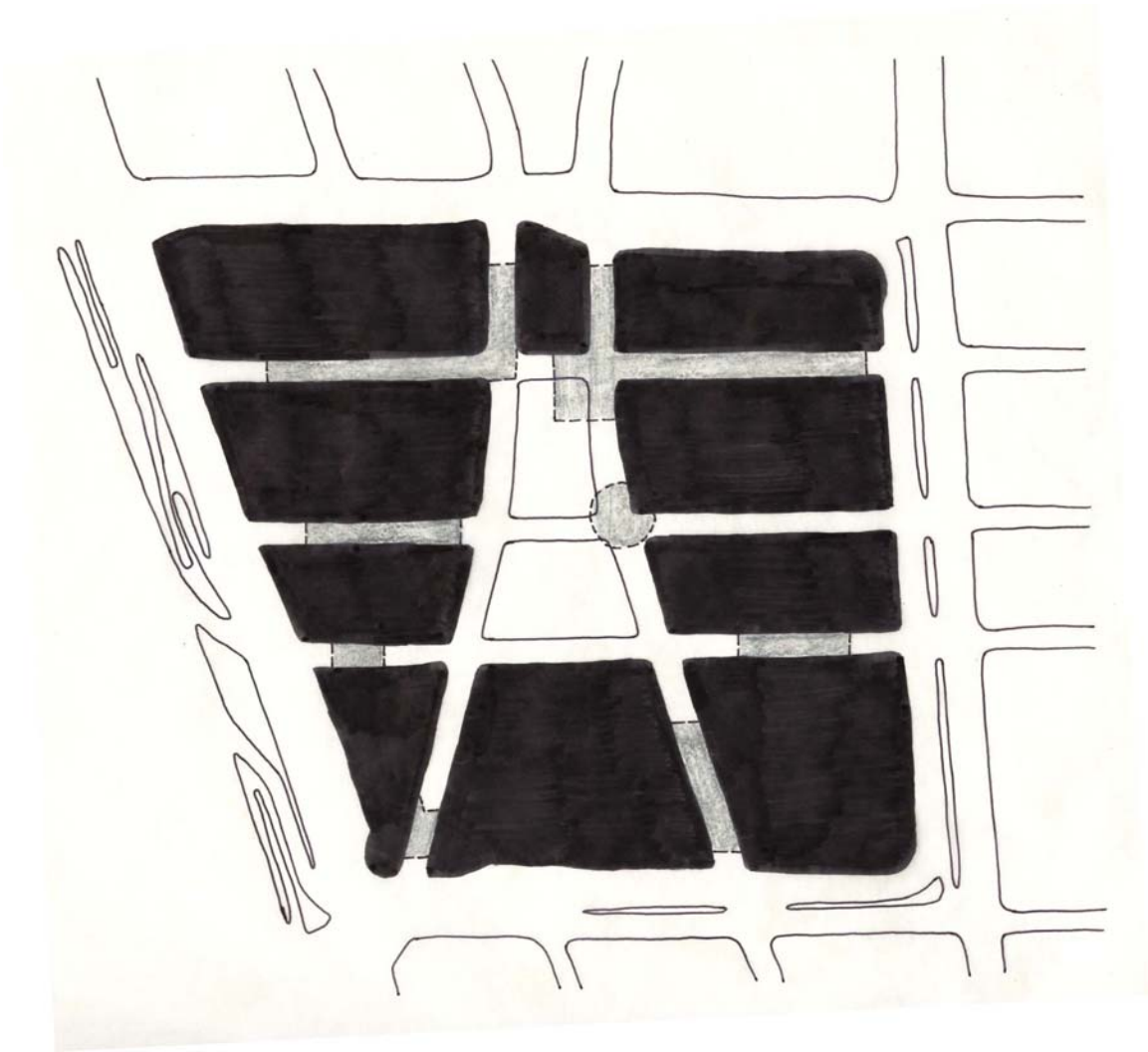


Figure 5.20: Palimpsest created by overlaying city grid and new buildings over the footprints of the WTC.

D. Program:

Program affords the opportunity to incorporate memorial into land use not only spatially as a physical manifestation of memory, but also thematically as a memorial response to the disaster. After the Oklahoma City bombing, an institutional response off site (the research center on terrorism) addressed the future and provided an active, intellectual mechanism for healing. On site, traditional memorial spaces addressed emotional and spiritual remembrance. At the WTC site these two different strategies for memorial could be combined. A similar institutional

response could provide the basis for new land use on site while more traditional memorial spaces tied to the institution could provide places for pilgrimage and mourning.

For example, the institution might take the form of Ocean North's "World Center for Human Concerns". (Max Protetch Gallery exhibit, Figure 4.7) As a place dedicated to peace, tolerance, and the encouragement of communication, employees would actively be pursuing resolution of the attacks on September 11. Not only that, the institution would signify the beginning of a learning process in America. By building a place of peace where the icon of power and money once stood, perhaps we are sending a message that human connections are more important.

The organization and form of building on site needs to reinforce the institutional theme. Ocean North does this symbolically by coating their new architecture in a human-like skin. However, their design lacks emotional engagement. How will people find sanctuary coming to the site to pay their respects and mourn? A form incorporating more traditional memorial spaces tied to the institution would create an avenue for this engagement. Communication, the theme of the institution, immediately evokes the idea of networks. The form of a network could serve as both the physical manifestation of the institution while at the same time organizing the space on site. A network of traditional memorial spaces could be interwoven into the fabric of the institution and any other uses on site.

One goal of the WTC site is to become a catalyst for revitalization in Lower Manhattan. A mixed-use development including institutional and memorial spaces seems most appropriate to accomplish this goal. People would work, eat, play, and live downtown. However, the nature of the tragedy that occurred suggests that people may not want to live directly on site. It therefore seems more appropriate to concentrate any new residential development off site, but in adjacent areas. The site itself can supply work, shopping, and entertainment facilities as it did previously.

These uses may share space with or lie adjacent to memorial spaces. For that reason, the impact of the memorial spaces will be critical. Memorial space in close proximity to other functional spaces should not be traumatic. People frequenting the site on a daily basis must

realize the sacredness of the place, but should not be constantly emotionally distracted as a result. Spaces protected from daily view should house more sensitive sites of remembrance. Christopher Alexander's pattern for Holy Ground suggests forming a series of nested precincts to organize sacred space, each marked by a gateway, each progressively more private, and more sacred than the last. The innermost final sanctum can only be reached by passing through all of the outer ones. (Alexander 1977, p.334) (Figure 5.21) This may provide a method for organizing memorial spaces on site.

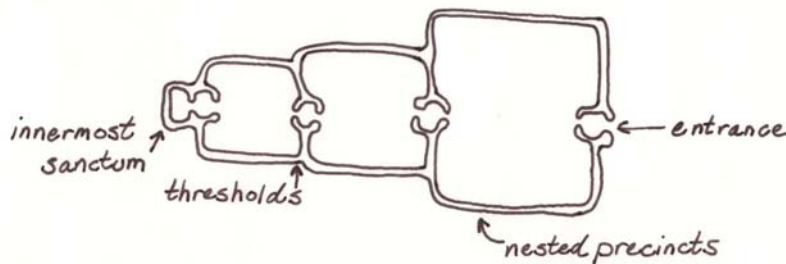


Figure 5.21: Christopher Alexander's pattern for Holy ground in *A Pattern Language*.
Source: Alexander 1977

In addition to local people who work on site, the magnitude of this tragedy and its affect on our national psyche will attract large numbers of visitors making pilgrimages to the memorial. The coordination of these two disparate activities of work and "pilgrimage" will also be critical to the design of the site. Visitors must have a meaningful way to pay respect and mourn in memorial spaces. At the same time crowds of tourists cannot hamper daily business and life. Figure 5.22 shows conceptually how different land uses might be positioned in relation to others to resolve the above use conflicts. Institutional and memorial spaces are placed in close proximity since they are related to each other, while frequently used retail, entertainment and other office spaces may require transitions into memorial spaces. It is important to keep in mind

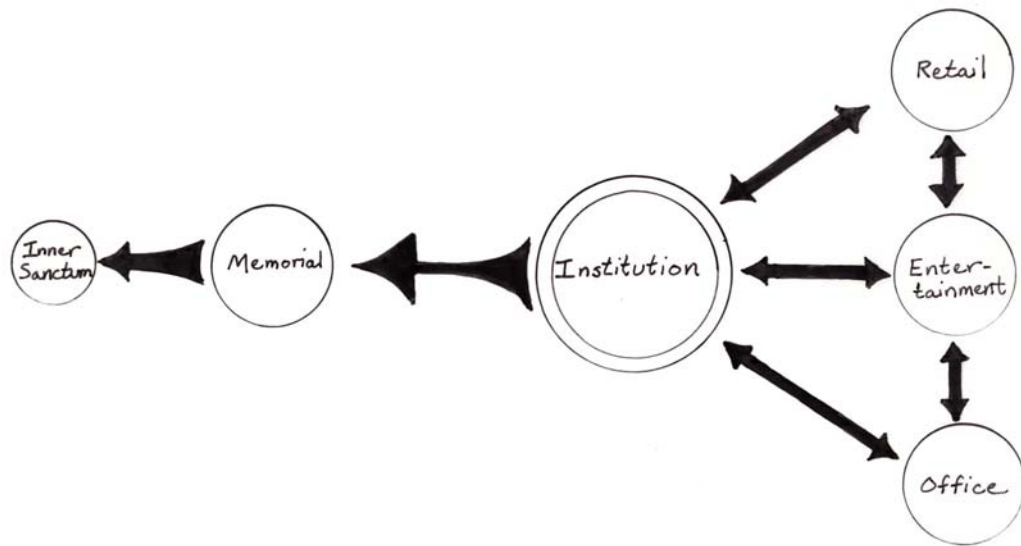


Figure 5.22: Conceptual network organization of programmatic activities. Arrows indicate transitional gateways. Progression from institution through memorial to inner sanctum follows threshold diagram Figure 5.21.

that the network of spaces would be both horizontally and vertically stratified. For example, if the observatory idea discussed earlier becomes one memorial space, it could be vertically separated from retail and entertainment that is located at ground level. Entertainment and retail facilities should be prominent at the ground level to provide the interest and vibrancy found at Piazza San Marco.

CHAPTER 6

CONCLUSIONS

September 11, 2001 will be remembered in American history like December 7, 1941. The 1941 attack on Pearl Harbor and the attack on the World Trade Center are our only experiences with assault on American soil. The attack on Pearl Harbor, however, was targeted at a military installation. The World Trade Center attack was targeted at the American people and our way of life. To date (May), 2,936 people have been reported dead. Two soaring icons are gone. A gaping hole remains in Lower Manhattan. September 11, 2001, indeed, represents an unprecedented tragedy in America.

Perhaps no right and wrong answers exist when discussing what to do with the former World Trade Center site. Due to its unprecedented nature, no protocol for rebuilding has been established for a disaster of this scale in America. Memorials have become a way our society assigns significance to events and collectively provides a place for mourning. Therefore no one seems to dispute the need for a memorial at the WTC site. The nature, meaning, and extent, however, of that memorial are highly disputed.

Much of the dispute arises from the fact that the WTC was an icon situated in the center of the business district of the most densely populated city in America. Therefore many pressures, aside from those to build a memorial to victims, exist. The site will be required to re-establish the economy, revitalize Lower Manhattan, recreate a symbol of New York, and reassert American values. Can one symbolic 16-acre site actually do all of this? I don't really know.

My thesis has taken the approach of effectively blurring the boundary between functional and sacred spaces in an attempt to satisfy the many demands on the site. By integrating memorial with new uses it may be possible to recognize the past, facilitate healing through both

remembrance and responsive action, and provide for a vibrant future. Having studied the history of the site and having explored precedent for incorporating commemoration into the rebuilding process, I believe there are four critical design elements that can preserve and communicate memory on the site while re-establishing an urban environment. These elements are height, architectural design, circulation patterns, and program.

Height has historically been a defining characteristic of the site that people all over the world recognize. Incorporating height or a reference to height in the new design preserves that memory. Architectural ruins and circulation patterns have been used in other cultures as a means of commemoration in rebuilding processes. Preserving a portion of ruined architecture following disaster, and incorporating it into new design links the past with the future. It provides a powerful and tangible reminder of the event. A portion of the South Tower wall of the WTC could be incorporated into a new building on site to preserve memory through architecture. Preserving historic circulation patterns creates the possibility of experiencing the past through ritual. In New York, local patterns can be expressed through the spatial organization of the WTC buildings and/or through the underlying city grid. Finally, the activities that characterize the future of the site have the ability to both preserve memory and create an avenue for response to the tragedy. The site can intellectually engage memory through an institution that works to resolve the premise of the attack. At the same time, traditional memorial spaces can emotionally engage memory. All of these memories can then be integrated with other uses on site through transitional spaces.

The incorporation of these ideas as presented in my thesis are a first step toward creating a palimpsest within the landscape. I believe that recognizing a balance between past and future provides for a richer experience in the present. Future research on this topic would need to explore more detailed design applications of these four elements on the site. In addition, public response to the ideas would be needed.

Since this strategy for design would be neither completely functional nor completely sacred, it represents a compromise, and in this compromise there is a danger that ultimately no

one will be happy. For example a citizens' group formed by families of the victims is lobbying vehemently against building anything on the site. To this group the site is a burial ground and therefore must be completely set aside as sacred. They believe that designating the entire site, as memorial is the only way as a society, to assign appropriate significance to the disaster. The irony of this is that the World Trade Center was built on landfill that already contained an African American burial ground. Clearly there are many layers of history at the site. On the other hand if the site is rebuilt as a mixed-use development to revitalize the city, will people readily adapt to carrying on their daily lives on the site so soon?

All parties may never be completely satisfied, but I believe there are greater possibilities for gain by integrating memorial with our daily lives. Some would argue that we are diluting the sanctity of the sacred by using it. I believe that by incorporating the sacred into our daily lives we will better understand our past through constant contact and we will learn to revere our everyday landscapes.

EPILOGUE

As of May 4, 2002, although public deliberations have only recently begun, crucial components of what will transpire on the former World Trade Center site seem to have already been decided upon by city and state officials. (Wyatt 2002, May 4) Apparently plans include the re-establishment of underground train routes as well as underground shopping. At street level, the re-connection of Greenwich and Fulton streets will divide the site into four quadrants. (Figure E.1) The southwest quadrant where the towers once stood will contain memorial space in addition to the new train station. The rest of the property will be devoted to new business ventures. There is no intention to build 100 story buildings anywhere on site. John C. Whitehead, chairman of the Lower Manhattan Redevelopment Corporation is careful not to say the plans are final, but instead believes that consensus has been reached. This recent revelation only serves to underscore the immediate need of design input such that the real estate and business community is not the only driving force in decisions about how to rebuild.

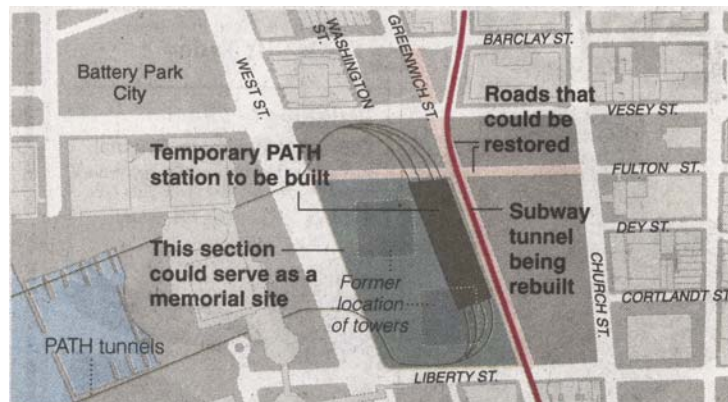


Figure E.1: Plan for World Trade Center site as of May 4, 2002

Source: Wyatt, Edward. 2002, May 4. Blueprint for Ground Zero Begins to Shape. *The New York Times*.

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