Torres Rojas, Genara FOI#13431

From: lbs4@columbia.edu
Sent: Tuesday, August 21, 2012 8:45 PM
To: Duffy, Daniel
Cc: Torres Rojas, Genara; Van Duyne, Sheree
Subject: Freedom of Information Online Request Form

Information:

First Name: Lynne
Last Name: Sagalyn
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City: New York
State: NY
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Phone: 917-699-8130
Required copies of the records: Yes

List of specific record(s):
1 Agreement between the City of NY and the Port Authority providing for the City to continue to meet and confer to revise the WTC commercial design guidelines and for the Citys continuing role in review and consideration of building and open space design issues and the development of a site-wide streetscape and open space plan for the WTC site. PA Board Meeting Minutes 9212006, p. 229. 2 Any urban design guidelines produced by the City of New York andor the Port Authority for the WTC site. Thank you.

THE PORT AUTHORITY OF NY & NJ

FOI Administrator

September 26, 2014

Ms. Lynne Sagalyn
Columbia Business School
3022 Broadway, 816 Uris
New York, NY 10027

Re: Freedom of Information Reference No. 13431

Dear Ms. Sagalyn:

This is in response to your August 21,2012 request, which has been processed under the Port Authority's Freedom of Information Code (the "Code") for copies of the agreement between the City of New York and the Port Authority providing for the City to continue to meet and confer to revise the World Trade Center commercial design guidelines and for the City continuing role in review and consideration of building and open space design issues and the development of a site-wide streetscape and open space plan of the World Trade Center site, Port Authority Board Meeting Minutes of September 21, 2006 page 229, and any urban design guidelines produced by the City of New York and/or the Port Authority for the World Trade Center site.

Material responsive to your request and available under the Code can be found on the Port Authority's website at http://www.panynj.gov/corporate-information/foi/13431-WTC.pdf. Paper copies of the available records are available upon request.

Certain portions of the material responsive to your request are exempt from disclosure pursuant to exemption (4) of the Code.

Please refer to the above FOI reference number in any future correspondence relating to your request.

Very truly yours,

Daniel D. Duffy
FOI Administrator

225 Park Avenue South, 17th Floor
New York, NY 10003
T: 212 435 3642 F: 212 435 7555

WORLD TRADE CENTER DESIGN GUIDELINES ADMINISTRATION AGREEMENT

This AGREEMENT entered into this 16th day of November 2006 (this "**Agreement**") by and between the PORT AUTHORITY OF NEW YORK AND NEW JERSEY (the " **Port Authority**"), a body corporate and politic, created by compact between the States of New York and New Jersey with the consent of Congress, having its principal offices at 225 Park Avenue South, New York, New York 10003, and THE CITY OF NEW YORK (the " **City**"), a municipal corporation of the State of New York, having its principal office at City Hall, New York, New York, 10007.

In consideration of the promises contained herein and other good and valuable considerations, the Port Authority and the City agree that the World Trade Center Commercial Design Guidelines (the "Design Guidelines"), shall be administered in accordance with the provisions set forth below. The Port Authority shall formally adopt the Design Guidelines in a form and substance agreed to by the City within ninety (90) days of the date of execution of this Agreement.

The City acknowledges that it has reviewed the conceptual plans associated with Tower 2, Tower 3 and Tower 4 attached hereto as Exhibit 1, The City agrees to consent to adoption of design guidelines for Towers 2, 3, and 4 for incorporation in the Commercial Design Guidelines if those design guidelines are in substantial compliance with Exhibit 1. For this purpose, "substantial compliance" shall mean:

a. that such design standards include the pedestrian circulation spaces at street level identified on Exhibit 1 (Drawing K-A3.01.1 Revision 04, dated 11/16/06), with no less than the minimum dimensions set forth in such Exhibit and in accordance with the Notes thereto;

b. that the maximum building elevations be as shown on Exhibit 1 (Drawing K-A3.02.1 Revision 03 dated 11/16/06);

c. that for Tower 2, the tower form include a slanted roof inflected towards the Memorial as depicted on Exhibit 1 (Drawing K-A3.02.1 Revision 03 dated 11/16/06) and that the distinctive architectural features (i.e., the "notches") be retained to visually break up the mass of the tower;

d. that for Tower 3, the tower form include the north and south "shoulders" in an asymmetrical composition with a minimum vertical separation of approximately 200' as depicted on Exhibit 1 (Drawing K-A3.02.1 Revision 03 dated 11/16/06), in order to reinforce the "cascading spiral" articulated in the Master Plan, and provide for increased light and air;

e. that for Tower 4: i. the tower form include the architecturally distinctive "glass atrium" along Church and Cortlandt Streets; and ii. that at a height as shown on Exhibit 1 (Drawing K-A3.02.1 Revision 03 dated 11/16/06) the bulk of the tower in the northwest corner be configured so that the tower footprint is modified from a parallelogram to a trapezoidal form, in order that the mass of the building relate back to T1 and the Memorial and provide for better light and air to T3. Such height shall maintain a minimum vertical separation of approximately 80' between this height and the south "shoulder" of T3

f. that the retail frontages along Church, Fulton, Dey, Cortlandt and Liberty be no less than the amount depicted on Exhibit 1 (Drawing K-A0.07 dated 10/04/06; the parties acknowledge that the escalator shown in the Cortlandt Street Right of Way is an error. Furthermore the Cortlandt Street Right of Way is subject to use restrictions agreed to by the City and Port Authority that specifically prohibits any such structure)."

In the event that the designs for any of Tower 2, Tower 3 and Tower 4 in later stages of design do not conform to applicable Commercial Design Guidelines, a variance or amendment shall be required pursuant to the procedures of Article II of this Agreement. The Port Authority specifically acknowledges that any design deviation with respect to the pedestrian circulation spaces referenced above shall require variance or amendment of the Commercial Design Guidelines, as applicable.

Article I
Review and Determination for Conformance or Minor-Nonconformance

Section 1.1: The Port Authority shall review and make determinations regarding conformity of the commercial projects at the World Trade Center Site with the Design Guidelines at four stages:

(a) Schematic Design Review: This review shall include evaluation of parcels and buildings for conformance with all applicable Design Guidelines, including but not limited to those relating to building height, bulk, massing, setbacks, streetwalls, maximum buildable tower area, permitted uses, materials, and general sustainability approach.

(b) Design Document Review: This review shall occur after Schematic Design Review, upon completion of the design development phases of a project, in order to ensure that preliminary plans maintain conformity with all applicable Design Guidelines and the plans approved at the Schematic Design stage.

(c) Contract Document Review: This review shall occur after Design Document Review, to the extent necessary to ensure that construction plans and

specifications maintain conformity with all applicable Design Guidelines and the plans approved at the Design Document stage.

(d) Construction Change Review: This review shall take place during construction to the extent necessary to ensure that any material changes to the approved final contract documents maintain conformity with the applicable Design Guidelines and the plans approved at the Design Document stage.

Section 1.2: The Port Authority shall provide the City with written documentation and support of its determination, with regard to conformance of a commercial project at the World Trade Center Site with the applicable Design Guidelines, at the completion of the Schematic Design Review stage, and shall request the City's written concurrence with respect thereto. The Port Authority shall provide additional documentation of its determination, with regard to conformance of a commercial project at the World Trade Center Site, with the applicable Design Guidelines during the Design Document, Contract Document Review and Construction Change Review stages only in the event that changes are proposed to approved plans and specifications during those stages which require reconsideration by the Port Authority due to non-conformance with the applicable plans and/or applicable Design Guidelines. The Port Authority shall request the City's written concurrence with respect to such additional determination(s), which concurrence the City shall not unreasonably withhold or condition. The City shall inform the Port Authority of its analysis and suggestions/recommendations within ten (10) business days following receipt of a properly documented Port Authority determination.

Section 1.3: Port Authority determinations shall take one of the following forms:

(a) Conformance: The commercial project conforms in all respects with the applicable Design Guidelines and/or the applicable plans pursuant to Section 1.1 above and should be approved; or

(b) Minor-Nonconformance: The commercial project conforms in all but minor respects with the applicable Design Guidelines and/or the applicable plans pursuant to Section 1.1 above, and should be approved; or

(c) Non-Conformance: The commercial project does not conform in substantial respects with the applicable Design Guidelines and/or the applicable plans pursuant to Section 1.1 above, and should not be approved.

Article II
Variances to Design Guidelines

The Port Authority may consider, on its own behalf, or at the request of an applicant/sponsor, variances from the applicable Design Guidelines with respect to any commercial project determined to be non-conforming under Section 1.3(c) above, during

the Schematic Design Review stage or the Design Development stage pursuant to Article I above. Such proposed variances shall be reviewed by the Design Guidelines Committee, established under Article IV below, to provide the Port Authority and the City with its analysis and suggestions/recommendations with respect to variances under consideration. The voting members of the Design Guidelines Committee shall consider the views of the other members of the Committee in making determinations with respect to recommend approval or denial of variances. A variance is defined as a non-conformity from the applicable Design Guidelines limited to a single commercial project on a single parcel, and shall not include any changes in the application of the Design Guidelines to any other commercial projects or parcels. A variance shall not require modification of the Design Guidelines.

Article III
Amendments to the Design Guidelines

The Port Authority or the City may propose amendments to the Design Guidelines. Proposals to amend the Design Guidelines shall be reviewed by the Design Guidelines Committee established under Article IV below, to provide the Port Authority and the City with its analysis and suggestions/recommendations with respect to amendments under consideration. The voting members of the Design Guidelines Committee shall consider the views of the other members of the Committee in making determinations with respect to recommend approval or denial of an amendment. An amendment is defined as a change to the Design Guidelines which relates to more than one commercial project or parcel. An amendment requires modification of the Design Guidelines in order to be implemented.

Article IV
Design Guidelines Committee

The Port Authority and the City shall establish a Design Guidelines Committee comprised of three (3) representatives each of the Port Authority and the City, and one (1) representative appointed by each of the Office Net Lessee(s) and Retail Net Lessee of the World Trade Center Site. The Committee shall have two voting parties, the Port Authority and the City, who will each have one vote. However, in the event that a particular project design and/or variance request pertains to a project within the East Bathtub area the representatives of the Office Net Lessee(s) and Retail Net Lessee will each have one representative for that particular proposed project, except that if the Office Net Lessee and/or Retail Net Lessee are proposing the project they shall not participate in the discussion and deliberations. In addition, the Design Guidelines Committee shall:

(a) Receive formal presentations of commercial project design concepts at the Schematic Design phase and the Design Development Phase; and

(b) Review and evaluate applications for variances from, or proposals for amendment to the Design Guidelines, determine whether to recommend approval, and issue a

written recommendation with respect thereto. Such written recommendations shall be issued within fifteen (15) business days of a meeting of the Design Guidelines Committee at which the application for variance or proposal for amendment was discussed.

Article V
Approval of Variances and Amendments

Adoption of a variance from, or amendment to, the Design Guidelines shall require the approval of both the Port Authority and the City and in the case variances and/or amendments pertaining to projects within the East Bathtub, the Office Net Lessee(s) and Retail Net Lessee. The parties shall approve or disapprove a proposed variance or amendment no later than five (5) business days following submission of the written recommendation of the Design Guidelines Committee pursuant to Article IV (b) above. The Port Authority shall act hereunder by its Executive Director. The City shall act hereunder by its Deputy Mayor for Economic Development and Rebuilding, or City officer succeeding to the responsibilities of such Deputy Mayor.

Article VI
Application of Agreement to Open Space and Streetscape Projects

The development of open space and streetscape projects undertaken at the World Trade Center site shall be governed by the applicable Design Guidelines Chapter to be adopted in accordance with the second paragraph of the introduction to this Agreement.

Article VII
General Conditions and Covenants

Section 7.1: No commissioner, officer, director, agent or employee of the Port Authority or the City shall be charged personally with any liability, or held personally liable in connection with this Agreement or any breach or attempted breach hereof. This provision shall survive the termination or expiration of this Agreement.

Section 7.2: The provisions of this Agreement shall be governed and interpreted in accordance with the laws of the State of New York.

Section 7.3: Except as the parties further agree, all notices to the City shall be sent to: The City of New York, City Hall, New York, NY 10007, Att: Deputy Mayor for Economic Development and Rebuilding, as well as to the Director, Department of City Planning, 22 Reade Street, New York, NY 10007, and all notices to the Port Authority shall be sent to the Port Authority of New York and New Jersey, 225 Park Avenue South, New York, NY 10003, Attn: Executive Director, as well as to the Director, Priority Capital Projects, 115 Broadway, New York, New York, 10006.

Section 7.4: In the event of a dispute arising in the administration of this Agreement, the parties shall establish a committee of equal number of Port Authority and City officials to

review and seek resolution. If the committee is not successful in resolving such differences, either party may request and if the other party agrees the matter shall be sent to the Deputy Mayor for Economic Development and Rebuilding and the Executive Director of the Port Authority for resolution. A decision by one party to disapprove a requested variance or amendment under circumstances where the requested variance or amendment has been approved by the other party shall not be deemed a dispute within the meaning of this Section unless both parties agree to consider it as such.

Section 7.5: The provisions of this Agreement are intended to be severable, If any term or provision of this Agreement or the application thereof shall, to any extent, be finally determined in a court of law to be invalid and unenforceable, the remainder of this Agreement shall not be affected thereby and shall be valid and enforceable.

Section 7.6: This Agreement may be executed in one or more counterparts which, when taken together, shall constitute one and the same document.

Section 7.6: This Agreement may be executed in one or more counterparts which, when taken together, shall constitute one and the same document.

IN WITNESS WHEREOF, this Agreement is executed the day and year first above written.

THE CITY OF NEW YORK

By: _____

Name: Daniel L. Doctoroff

Title: Deputy Mayor for Economic Development and Rebuilding

PORT AUTHORITY OF NEW YORK AND NEW JERSEY

By: _____

Name: _____

Title: _____

IN WITNESS WHEREOF, this Agreement is executed the day and year first above written.

THE CITY OF NEW YORK

By: _____

Name: _____

Title: _____

PORT AUTHORITY OF NEW YORK AND NEW JERSEY

By: _____

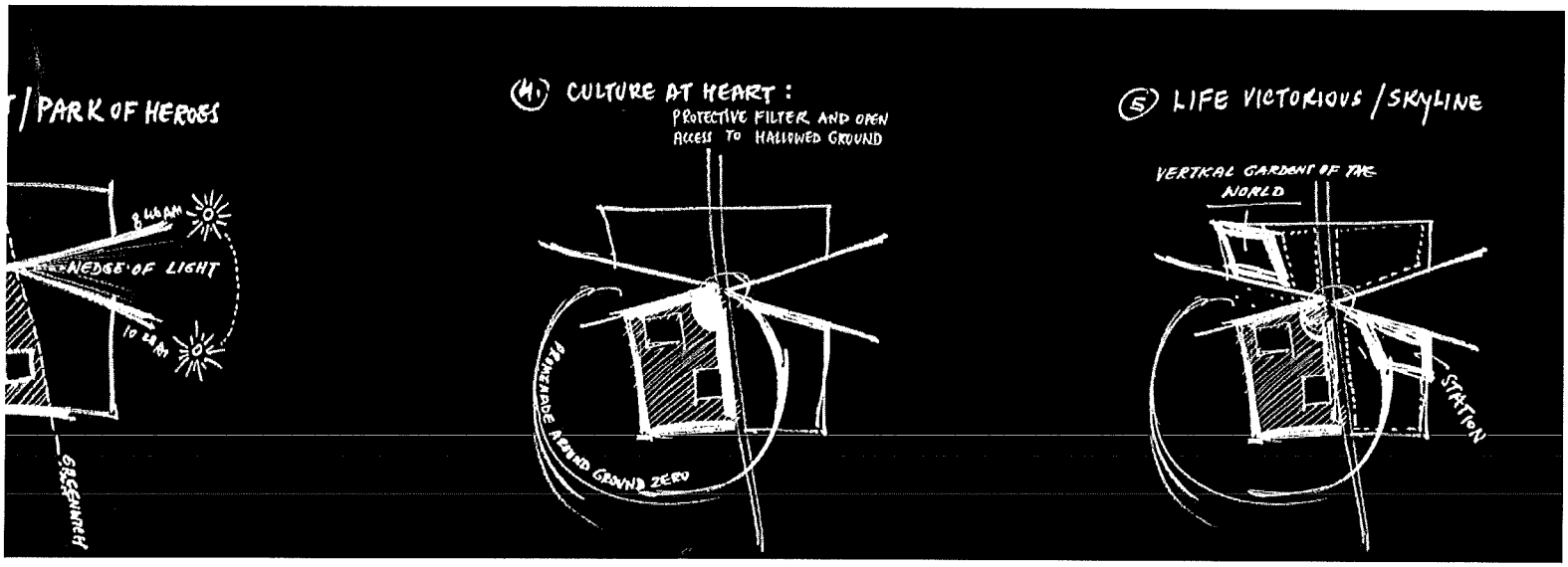
Name: Michael B. Francois

Title: Chief of Real Estate and Development
The Port Authority of New York and New Jersey

EXEMPTION (4)

DRAWINGS OF NON-PUBLIC AREAS

MEMORY FOUNDATIONS
WORLD TRADE CENTER COMMERCIAL DESIGN GUIDELINES



Final Draft - February 2007

MEMORY FOUNDATIONS

WORLD TRADE CENTER
COMMERCIAL DESIGN GUIDELINES

STUDIO DANIEL LIBESKIND
FINAL DRAFT

FEBRUARY 2007

February 2007

Lower Manhatten Development Corporation
Port Authority of New York and New Jersey

Dear Collaborators on the World Trade Center Redevelopment Project:

We are pleased to submit these guidelines for the commercial development and open space components of the World Trade Center Memorial and Redevelopment Plan. The guidelines are a culmination of over three years of dedicated and creative work by members of your organizations, the World Trade Center leaseholders, the City, other state and regional agencies, and the consulting team for the project, under the leadership of Studio Daniel Libeskind.

These guidelines translate the vision of the Memory Foundations Master Plan into a set of principles and standards that will guide the design of each project, and your review of proposals by developers. They focus on the public realm of the World Trade Center site, the five sites available for office, retail and the significant new open spaces that will be created in the Memorial and Redevelopment Plan, while also including for reference the memorial and cultural parcels and the system of underground concourses. Separate guidelines have been prepared for the WTC Transportation HUB, and these are synchronized with this document.

In preparing the guidelines we have asked: what are the essential elements of the master plan that must be respected, that will give the site its special character? What are the upper limits of development, heights, dimensions, and uses, beyond which the site will be overstressed? How much unity should there be in site development, and how much flexibility can be provided to spark the imagination of future designers and developers? How should projects be reviewed to ensure that they are consistent with the overall vision for the World Trade Center? We believe the guidelines strike a balance between firmness and flexibility, practicality and vision, prescription and process.

The guidelines allow the redevelopment to move forward with the assurance that the vision of the overall plan will be advanced with each development project. Inevitably, there will need to be changes as time reveals new opportunities, and the experience of building the first projects suggests improvements to subsequent phases. But this is also a planned development, guided by a vision of a new kind of city for the century just begun. And it is a statement about the optimism of and resilience of New York, and its determination to demonstrate to the world that it can remake itself in the face of disaster.

It has been our pleasure to collaborate with you in this most important project. We look forward to helping assure that the World Trade Center is the finest example of urban development of its time.

Studio Daniel Libeskind

Submittal Letter

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INTRODUCTION 1

The Memorial and Redevelopment Plan for the World Trade Center site emerged from an unprecedented public planning process based upon the highest expectations for every area of the project. The overall vision can be achieved only with a clear set of design guidelines, the bases for which are discussed here in Section 1.

Introduction 1.1

Purpose of Guidelines 1.2

Design Guidelines Committee 1.3

1.1 Introduction

Rebuilding the World Trade Center requires a new model for New York City and for twenty-first century development. The symbolism of a new center rising from the ashes of destruction, and its sheer size, visibility, and importance as the nexus of remembrance, commerce, culture, transit, and civic space in Lower Manhattan - all demand that it become a place with meaning and coherence. Its form must embody references to the past, but also project optimism about the future of urban centers. The design guidelines embody a vision for the project site that emphasizes public spaces and a pedestrian realm of coherence and quality, that reconnects streets to integrate a vibrant new commercial and cultural neighborhood with the city, and that creates a respectful memorial setting.

In accordance with the World Trade Center Memorial and Redevelopment Plan Record of Decision and Findings Statement as well as the World Trade Center Memorial and Cultural Program General Project Plan, both adopted and affirmed by the LMDC Board of Directors on June 2, 2004, Commercial Design Guidelines must be developed for the World Trade Center site. Such guidelines must be adopted by the LMDC and the Port Authority with input from involved and interested parties including the Department of City Planning and the Port Authority's net lessees. The intention of these guidelines is to establish a framework for the development of the commercial and retail elements as well as the public open spaces, encouraging designers to be creative in the design for each component while defining the essential elements that will ensure that each part of the development contributes to the overall vision.

These design guidelines represent a compact among all those charged with designing, planning, and overseeing the redevelopment process – and with the public - that has demanded the highest quality of design and development. They build upon the successful design and construction of large-scale urban centers in New York. The guidelines provide general parameters for the amount, type, form, and architectural character of development. They also describe the relationships between various components of the site that are critical to the success of the overall plan. The guidelines provide a broad, but well-defined framework to enable the creativity of designers, and maintain flexibility in the precise program for each structure. At the same time, they spell out the essential elements that will ensure that each structure and project contributes to the bold vision agreed upon by all. The Memorial and Redevelopment Plan has been developed through the most comprehensive public planning process ever undertaken for such a project. The shared vision for the World Trade Center will take many years to be realized and will occur only through the efforts of many contributors. It is critical that the vision be maintained throughout this process.

The design guidelines are also a practical necessity. With millions of square feet of development planned for the 20.6 acre site, a high level of coordination is required to ensure that foundations, structures, building services, mechanical/electrical systems, vertical and horizontal movement routes, and public safety

functions are designed in the most effective manner. Although below-grade transportation facilities, parking, service areas, and commercial spaces will be built simultaneously with the above-ground East Bath Tub structures including Towers 2, 3 and 4 and the WTC Hub, other above grade structures in the West or South Bath Tub areas may not yet have detailed plans available. Hence, it is essential that the envelopes of future development be described as clearly as possible to avoid future disruption of completed portions of the complex as successive stages are built.

These guidelines are based on the **Memory Foundations Master Plan**, developed by Studio Daniel Libeskind, LLC, working with the Port Authority, the LMDC as well as other city and state agencies, which provides an integrated vision for development of the project site.

Purpose of Guidelines 1.2

As a project of the Port Authority and the LMDC, these guidelines establish a development framework for the commercial and retail elements as well as public open spaces indicated on the World Trade Center master plan. They describe the form, character, and standards of development that will guide the implementation of this master plan, while allowing individual components to move forward in response to market conditions and needs. The guidelines document also defines the process for reviewing the indicated commercial projects as they are developed in the future.

Specific development guidelines have been created for each parcel planned for commercial/retail buildings. In addition, general design parameters have been included for the streets and ground-level open spaces on the site.

The guidelines document also includes use, location, and boundaries for the memorial and cultural parcels as they relate to and define the commercial parcels, streets, and public open spaces. This document does not provide design guidelines for the memorial and cultural parcels or buildings within them. LMDC will develop separate guidelines for these parcels.

An open international design competition determined the selection of the conceptual design for the memorial "Reflecting Absence" by Michael Arad and Peter Walker in memory of those who lost their lives in the 1993 bombing and the 2001 destruction of the World Trade Center.

The guidelines document is organized in the following areas:

Project background (Section 2) is a summary of the historical and contextual issues that are relevant for the future development of the World Trade Center site. It describes the

- history of the site leading up to the construction of the World Trade Center
- conditions of the World Trade Center before it was destroyed
- site conditions today
- buildings around the site
- public transportation network
- vehicular and pedestrian traffic conditions

Goals and objectives (Section 3) govern both the Master Plan and these guidelines. They outline the

- character of the memorial experience
- relationship between the memorial experience and the resurgent life in Lower Manhattan
- re-connection of the World Trade Center site with Lower Manhattan
- development of state of the art retail and office spaces
- creation of a coherent public realm and a range of public open spaces
- creation of interesting and dynamic streetscapes
- restoration of the skyline of Lower Manhattan through a cascading spiral of towers
- development of an iconic tower responding to the Statue of Liberty
- development of cultural and transit buildings that reinforce the civic importance of the site

Overall site development guidelines (Section 4), are intended to indicate block patterns and coordinate the flow of people, vehicles and goods across the site. They indicate the:

- site development program
- compatibility of uses
- overall transportation and movement systems
- sites for development and open space
- locations of key entrances to underground service zones and pedestrian concourses
- location and size of underground service zones

Parcel development guidelines (Section 5), are intended to set the parameters for structures that will be designed on the site. They indicate the

- allowable development on each site
- three dimensional distribution of uses and activities
- essential elements of building massing – setbacks, orientation of structures, location of entrances and required street walls
- palette of suitable exterior materials
- critical design elements aimed at unifying the appearance of structures and promoting human comfort, safety and convenience.

Public open space guidelines (Section 6), are aimed at coordinating the public realm so that it unifies the site. They indicate the

- programs for open spaces
- character of spaces
- lighting patterns, street furnishings and other streetscape elements
- security elements to be incorporated in public spaces
- materials for walls, paving and other elements
- materials for plantings and other landscape features

Retail guidelines (Section 7), are aimed at unifying above grade and underground commercial concourses. They indicate the

- form and character of commercial shop fronts
- materials and elements along pedestrian ways

Sustainable design guidelines (Section 8), define standards and strategies for promoting development that is energy efficient, improves air and water quality on the site and beyond, minimizes demands on off-site infrastructure and systems, and promotes the use of materials and methods that conserve critical resources.

Signage guidelines (Section 9), cover informational and wayfinding signage and standards for signage appropriate for the desired character of the public areas and of the commercial concourses and storefronts.

1.3 Design Guidelines Committee

The redevelopment of the Site will be carried out in phases over an anticipated period of approximately 12 years. In order to assure that the open spaces, buildings and other features designed and built throughout the entire development period reintegrate the site with the rest of Lower Manhattan, exemplify excellence in design, are consistent with the vision for the site, and are compatible with the intent of the WTC Memorial and Redevelopment Plan, a set of Commercial Design Guidelines will be adopted by the Port Authority, which is responsible for implementation of the Redevelopment Program. The Commercial Design Guidelines will guide future development for the Redevelopment Program in a manner consistent with this general project plan and the environmental review. LMDC, the city, the Port Authority and the Port Authority's net lessees have worked together in a cooperative manner with respect to the formulation of the Commercial Design Guidelines. Following their adoption by the Port Authority, in a form acceptable to the City, administration of the Commercial Design Guidelines will be governed by agreement between the Port Authority and the City. A Design Guidelines Committee has been created to administer the Commercial Design Guidelines in accordance with these agreements.

PROJECT BACKGROUND 2

These guidelines outline a strategy for the creation of a new neighborhood with an unparalleled combination of cultural, commercial, transportation and open-space opportunities. New development on the site represents the latest chapter in the history of the World Trade Center site. Section 2, Project Background, discusses the site's history and characteristics.

History of the World Trade Center Site 2.1

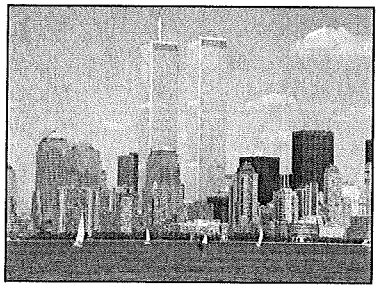
Pre-9/11 Conditions 2.2

Post-9/11 Conditions 2.3

Relationship to Context 2.4

Surrounding Structures 2.4.1
Transportation Network 2.4.2
Pedestrian Movement 2.4.3
Vehicular Movement 2.4.4

2.1 History of the World Trade Center site



World Trade Center, 1990s

The World Trade Center stood as a symbol of New York's connection to the world, and of the soaring aspirations of the city. The twin towers were an instant icon, even before their completion in 1972-3, reshaping the skyline, spurring development to the west, and refocusing attention on Lower Manhattan. When they opened, they were the two tallest buildings in the world, but even as they were surpassed they remained the best-known tall structures in the world. Part of their attraction was their sheer height, but the drama was also in their composition – not one, but two virtually identical structures, soaring above the tall buildings nearby that had for a century symbolized the history of building skyscrapers. On the ground, and below it, the World Trade Center complex was the hub of movement in Lower Manhattan, traversed by several hundred thousand people each day - workers, business people and tourists, shoppers and commuters. All this changed on September 11, 2001.

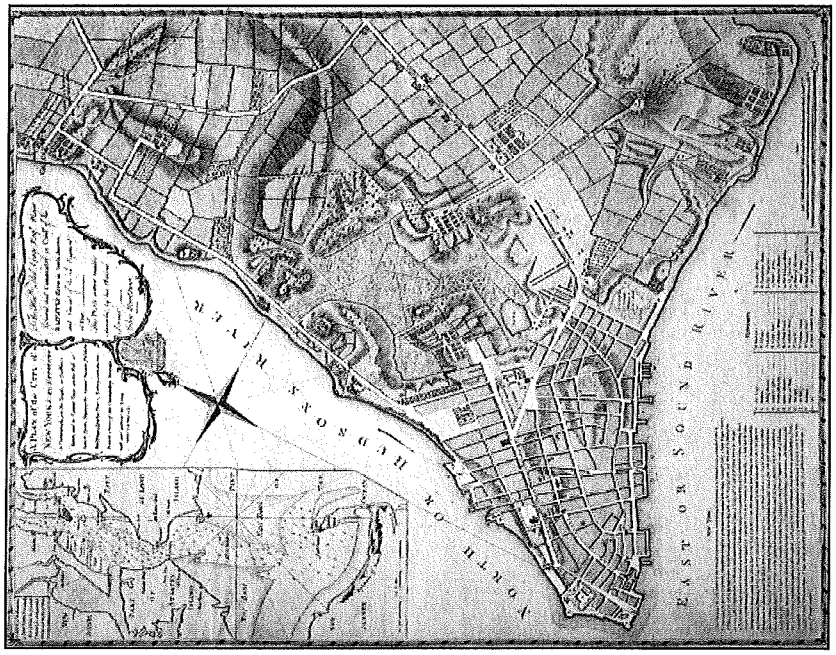
On that clear, crisp September morning, two passenger airplanes traveling from Boston to Los Angeles were hijacked by armed terrorists and redirected to New York City. The first was flown into the 93rd floor of the north tower of the World Trade Center at 8:46 am. The second airplane followed at 9:03 am, penetrating the 78th through the 84th floors of the south tower. The attacks caused massive explosions that showered burning debris over surrounding buildings and the streets below and ignited fires within the towers themselves. The south tower of the World Trade Center collapsed at 9:59 am and the north tower fell at 10:28 am.

Nothing could have prepared New Yorkers or the world for this tragedy. But the memory of an earlier event remained vivid to those who had worked at or used the World Trade Center eight years prior. On February 26, 1993, at 12:18 pm., a terrorist truck bomb exploded on the B-2 level of the World Trade Center, killing six people and injuring thousands. The bomb created a five-story crater underground and caused severe damage to the complex, including emergency communications, electricity and water systems.

The formal return of office tenants to the complex began six weeks after the 1993 attack. It will take a decade or more to reconstruct the World Trade Center, but there is equal determination to create a complex that exemplifies the best of contemporary urban development.

Evolution of the Site

For most of its history, the World Trade Center site was not the center of New York's activities. In the decades after 1623, when New Amsterdam was established, the Hudson River shoreline was dominated by Castle Clinton, a fort at the tip of the island, and a protective wall extending northward to Wall Street. Commercial activity clustered on the East River waterfront and along Broad Street, the traces of the original native trail. By the middle of the 18th century, the settlement had burst its walls and a new plan was required. John Montresor produced such a plan in 1766, laying out a gridiron west of Broad Street, and

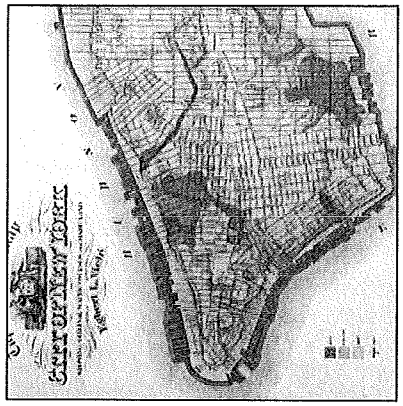


Montresor Plan, 1766

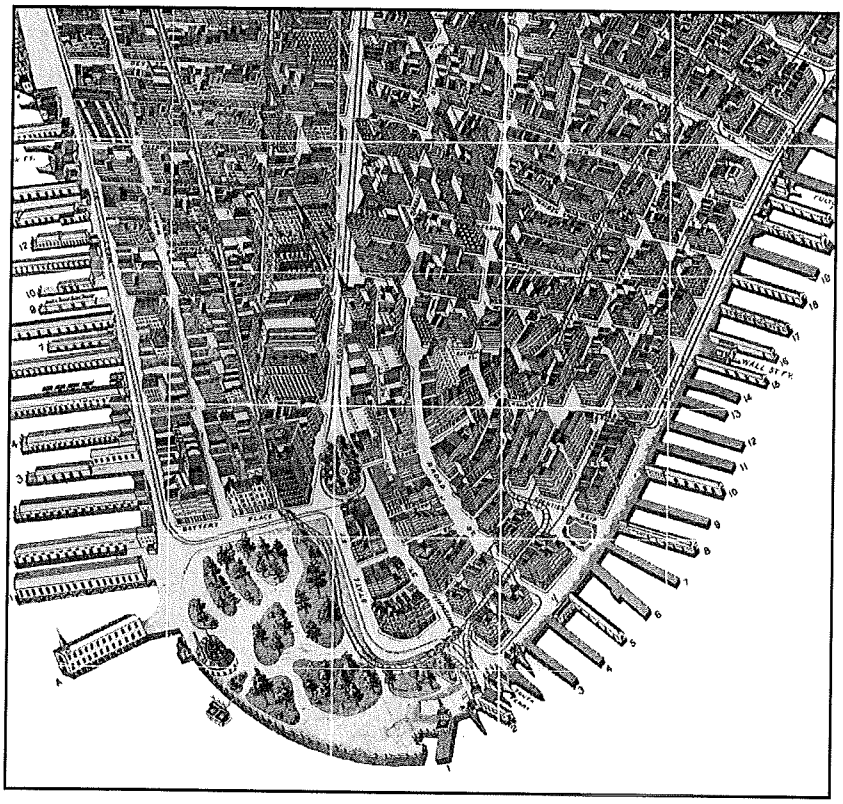
creating a waterfront street that ultimately became Greenwich Street, connecting with farmlands and settlements on the Hudson shore. As shown in the accompanying map, half of the current World Trade Center site was under water when settlement first reached its location.

By the 1790s New York had created its first stock market and prospered with financial businesses, wholesale and retail trade, warehousing, and ship building. Development had moved northward to Chambers Street, but the pace of immigration made it clear that it would need to find room beyond. Thereupon began a process that would characterize the development of Manhattan for almost two centuries – expanding northward, filling land on its shorelines, and creating the transportation routes and infrastructure to accommodate ever larger and denser patterns of settlement, and, as land became more valuable, building upward ever higher.

By 1827, two blocks of new land had been created by fill along the Hudson shoreline, following the Commissioner's plan of 1811, which also established West Street as the new access street to the wharves along the river. The streets now named Vesey, Fulton, Dey, Cortlandt and Liberty were extended westward, and a new north-south street, now Washington, was created through this plan. Initial wooden buildings in the area were replaced by larger brick and masonry structures, and the Hudson River waterfront became a bustling center of maritime commerce, warehousing and residences. Land filling on the Hudson came to a halt with the passage of the Federal Rivers and Harbor Act in 1888, which established bulkhead and pierhead lines. By that time, settlement had extended to midtown Manhattan and beyond, and newer and larger piers were being



Lower Manhattan, 1864



Lower Manhattan, 1896

constructed northward on the Hudson and East Rivers.

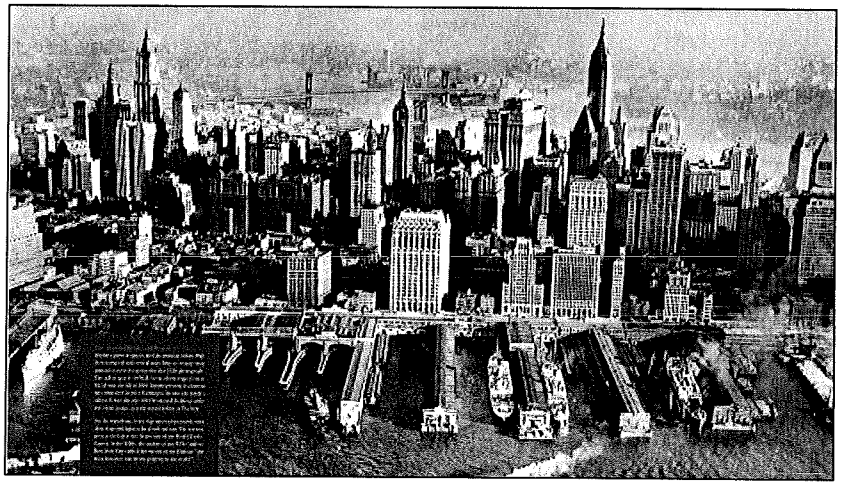
In 1870, the arrival of elevated rail trains connected the city, running along Second, Third, Sixth and Ninth Avenues and extending from South Ferry into the Bronx. By the early 1900s, it was obvious that the elevated trains were undersized for the volumes of travelers in the city, and private companies began to plan for the construction of underground lines. The first subway, the Inter-Borough Rapid Transit (IRT), was 22 miles long and opened in 1904. Five other lines followed, making Lower Manhattan the densest nexus of transportation lines in the city, and perhaps in the world. Between 1874-1908 tubes were constructed under the Hudson to provide direct passenger rail service to Lower Manhattan, and a new Hudson and Manhattan Terminal was constructed on lands that now include the World Trade Center site.

Improved transit service and innovations in building technology – especially the elevator and steel frame structure – made it possible to concentrate larger numbers of businesses and people in Lower Manhattan. This was also fueled by the changing nature of American businesses, the increasing importance of access to capital to serve national and international commerce, and the advent of the telephone, which allowed financial and management divisions of corporations to be located at a distance from their factories. Skyscrapers began to be built

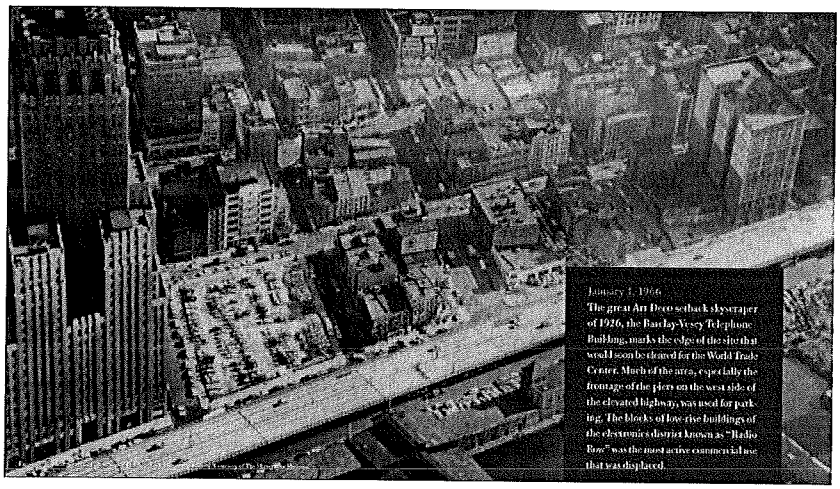
in Lower Manhattan, culminating with the Woolworth Building, the "Cathedral of Commerce," with 60 floors, built in 1913. Wall Street's famous canyons were created between 1913 and 1933 when the financial district prospered (and collapsed), and new structures were built for J.P. Morgan and Co., the American Surety Co., the Irving Trust Company and Banker's Trust Co. on narrow streets within a few hundred feet of each other.

But even as it savored its success, Lower Manhattan found itself increasingly in competition with Midtown and other locations that were less congested and had building sites more suited to the large floors sought by modern corporations. Midtown had gained transportation advantages with the opening of Pennsylvania Station in 1910 and the electrification of Grand Central Terminal in 1913. It was becoming the corporate center and a center for the arts. Additionally, Midtown was also a live-work environment where corporate executives could live close to their offices, and could dine and enjoy culture nearby. Those who chose to live in suburbs could commute to their offices without having to endure a lengthy trip on New York's overcrowded subway system. And specialized districts emerged for advertising, legal services, media and other corporate services – while Lower Manhattan remained largely centered on financial services.

From 1900 to mid-century, New York's Hudson River waterfront from the Battery to 59th Street was the busiest port in the world, with freighters, ocean liners, steamboats, ferries, and tugs filling its piers. The piers first serviced steamship lines, which were gradually acquired by the railroad companies. Goods were transported by rail to New Jersey, moved by scow across the Hudson, and stored in sheds on the piers. In some instances, rail cars with raw materials were transported by barge to Manhattan, and returned to New Jersey with manufactured materials. Although the port was thriving in the 1930s, the Holland Tunnel (1927) and the Lincoln Tunnel (1937) initiated its demise, as trucking became New York's primary means of transport. Around 1960, the transportation revolution made the Manhattan waterfront largely obsolete: jet travel replaced the



Eventual World Trade Center site, 1930



Eventual World Trade Center site, 1966

great ocean liners, even as new super liner piers were being built to accommodate them better, and containers replaced net cargo as the main system of moving goods. The result was a vacuum on the waterfront, and nowhere more so than in Lower Manhattan where piers were oldest and in poorest repair.

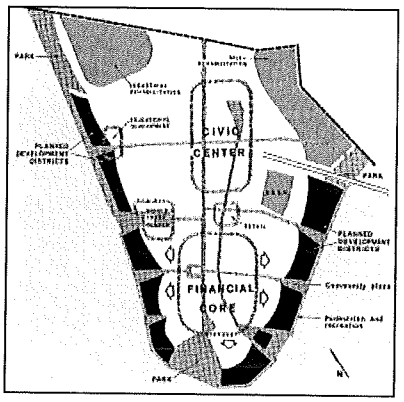
By the 1960s, the area bounded by Liberty, West, Vesey, and Church Streets had lost most of its waterfront oriented commerce, but had evolved into a remarkable district of thriving small retail stores specializing in everything from pets to athletic supplies. It was dominated, though, by those selling televisions, radios, and high-fidelity sound equipment and parts, particularly the infinite variety of vacuum tubes on which electronic home appliances once ran.

The Radio District actually consisted of several small, intimately interwoven districts. Shoppers browsed through stores selling plants, flowers and seeds, a variety of foods, army surplus, hardware, and used books. Many ecclesiastical supply houses, of which two remain, clustered on Barclay Street near St. Peter's Church; specialty food shops from the nearby Washington Market also blended in. Even fireworks dealers once spiced the wildly diverse mix. The Radio District developed primarily because of its proximity to the Hudson River piers, where vast quantities of merchandise were discharged.

Housed in dilapidated old buildings, with merchandise spilling out into sidewalk displays, the shops formed an active bazaar. Shoppers looked, lifted, sniffed and otherwise inspected what interested them. An afternoon of pleasant distraction was easily found in the fantastic variety and color of the Radio District. Unlike the Swamp, which disappeared in part because New York's leather trade had declined, business was good for Radio District merchants. It was a popular lunchtime and rush-hour destination for thousands of Lower Manhattan office workers.

All of this energy dissipated in the evenings and on weekends, when streets were

deserted and only those seeking the contradiction of being alone in the densest place in the world could be found there. Sensing the area's imminent decline, the financial community, acting through the Downtown Lower Manhattan Association, joined forces with the Port Authority of New York and New Jersey to reinvent the area. The Lower Manhattan Plan, published in 1966, proposed a new round of land filling around the perimeter of the entire tip of the island, creating new space for modern offices, commerce and, for the first time, housing. Deep coves would penetrate at key locations, creating plazas at the foot of major streets running to the water. The decision to construct a new headquarters for the Chase Manhattan Bank ignited a round of construction of modern office buildings that altered the skyline of Lower Manhattan.

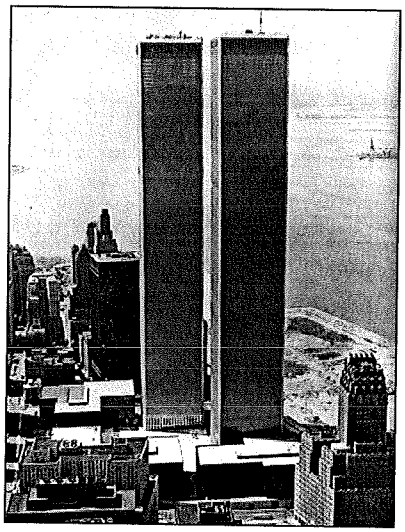


Lower Manhattan Plan, 1966

The World Trade Center

Austin Tobin, executive director of the Port Authority of New York and New Jersey, working closely with Governor Nelson Rockefeller, stepped forward with a plan to create a World Trade Center that would stimulate trade in New York's ports and revive Lower Manhattan. American architect Minoru Yamasaki was hired to design the project, and proposed two elegant towers, to be the tallest in the world, surrounded by smaller structures, and fronting on a grand public plaza. Yamasaki once said, "The World Trade Center should, because of its importance, become a living representation for man's belief in humanity, his need for this cooperation, his ability to find greatness." The twelve million square feet of floor space took over a decade to rent...and a large portion of the office space was initially filled by government agencies and the Port Authority. Nonetheless, the World Trade Center had a catalytic effect on development in Lower Manhattan, and dramatically changed its image. And, over time, it became a center for global financial firms.

Construction of the World Trade Center was a remarkable achievement, and exemplified the planning ideas of the day. Intermediate streets across the site were eliminated, creating a 16 acre super-block, with a ring road for drop-offs and service rimming the site. The western half of the site was excavated to bedrock – some 75 feet below grade – and protected from intrusion of ground water by a three foot thick slurry wall. Five levels of underground structure provided access to a new PATH station, accommodated about 400,000 square feet of retail space along concourses, and housed central utility areas, storage vaults and parking. At ground-level, a large public plaza added a new kind of open space to Lower Manhattan, and while often buffeted by strong winds, recent improvements had begun to transform it into an active urban space.


World Trade Center, 1970s

Much has changed since the World Trade Center was completed in the early 1970s. Excavation from the foundations of the center was used as the initial land-fill for Battery Park City, the only portion of the perimeter land-fill proposed in the Lower Manhattan Plan that was completed. Today the World Financial Center competes with the Wall Street area for dominance of Lower Manhattan business activity, and over 9,000 residents live in Battery Park City's two

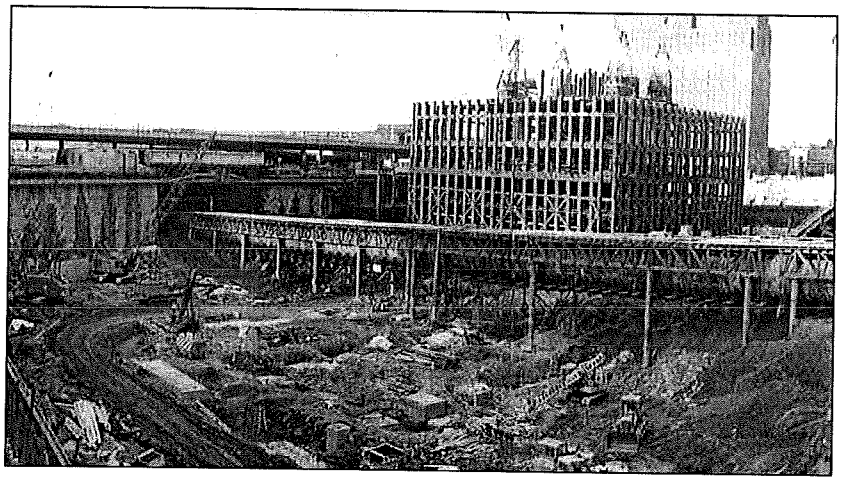
neighborhoods. New parks line the Hudson River waterfront from Battery Park to 57th Street. Thousands of new residents have moved into converted warehouse loft apartments in Tribeca, and dozens of older office structures have been converted into housing and high-tech offices at the edges of the financial district.

While these new uses have begun to recreate Lower Manhattan as a live-work district, traditional offices and financial service firms have continued to migrate from older structures in the financial district to Midtown, Brooklyn, New Jersey and other suburbs. The changing organization of financial services industries, electronic trading and e-commerce, and the globalization of finance have all taken their toll on the dominance of the area. By September 2001 there were 15 million square feet of vacant office space in Lower Manhattan.

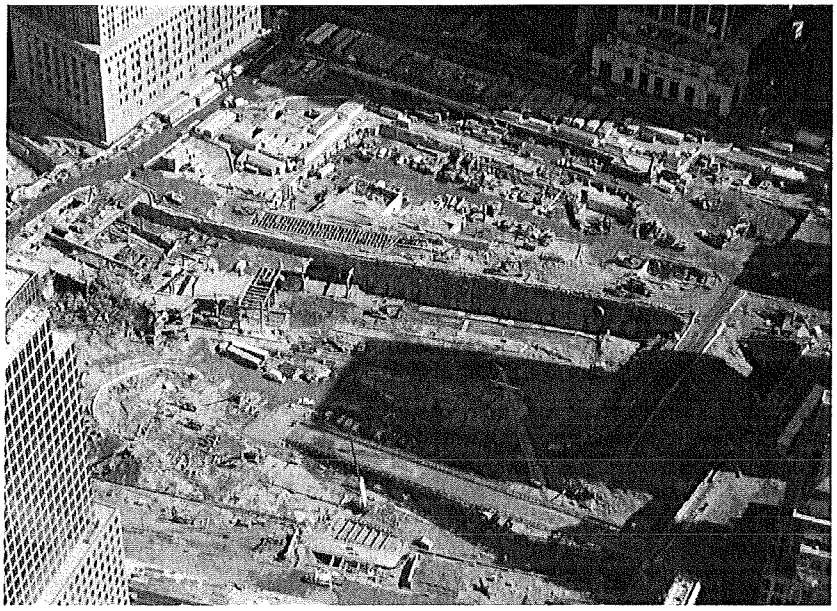
The challenge today is to reinvent the World Trade Center in a way that again makes it a magnet for world commerce and business. It will need improved infrastructure, particularly linkages to regional airports. It will again need to be ahead of its markets, and to compete effectively it will need to be demonstrably better than any other facilities available. New cultural and commercial uses need to be introduced, and along with the ongoing transformation of parts of Lower Manhattan as residential and small business areas, it can become the center of a new kind of district for living, working and tourism for the 21st century.

The Site and Its Natural Context

Little remains of the previous World Trade Center, but the geological and topographic conditions continue to be relevant. The site is set on a ridge of Manhattan schist, approximately 100 feet below street level. Bedrock close to the surface is one of the reasons that tall buildings have been built in Lower Manhattan over the years. The profile of schist in Manhattan mirrors the skyline – it dips to over 250 feet below the surface in the Village before reemerging close to the surface in Midtown.



Construction of World Trade Center, 1968



World Trade Center Site, 2002

The street elevations surrounding the site range from five to 23 feet above high tide. Indeed the site's history has a vital relationship to its surrounding waters. The slurry wall, which delimits the "bathtub" on the west portion of the site, exists in dialog with the river, whose tides reach nearly to the top of the wall. At the time it was constructed, the Hudson shoreline was only about 250 feet from the slurry wall. As Battery Park City has been filled, the bulkhead has been hardened with rock, containing the tides and further isolating the site from the Hudson.

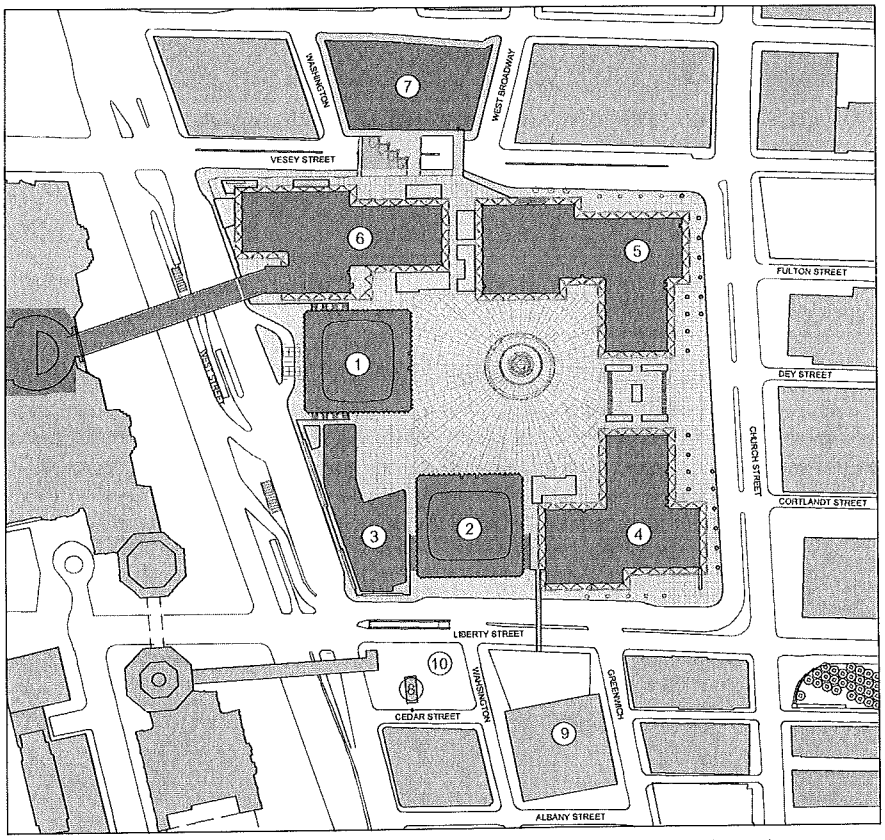
Existing "slurry walls" hold back the earth and define two very large excavated volumes of space. The western portion, more commonly known as the "bathtub," is a 3-foot thick concrete wall that forms a ring between the 1/9 subway below Greenwich Street, Vesey Street, West Street and Liberty Street. The west walls are approximately 65 feet high and define an area of 475,000 square feet producing a volume of 30,875,000 cubic feet. The eastern excavation is currently only about half as deep as the bathtub, and is restrained by a foundation wall that is correspondingly more modest. Future plans for the site include the full excavation of this portion of the site, and the construction of new retaining walls to protect below ground space from ground water.

The World Trade Center site is located in the Newtown Creek drainage basin which sends all sewerage beneath the East River to a plant in Brooklyn. The original World Trade Center complex used river water for cooling, taken and returned to the Hudson via two large tubes that pass under Battery Park City. The tubes entered the site through the slurry wall in the western bathtub at an area currently planned for the memorial precinct. The river water cooling system remains a cost effective and environmentally sensitive system for servicing the rebuilt center, but the inlet and outlet tubes must be relocated to conform to the

Memorial and Redevelopment Plan.

The PATH tubes, which utilize the original Hudson and Manhattan tubes, enter from the west near the bottom of the bathtub. These tubes, the vertical profiles of the tracks and the clearances required for the catenaries establish a datum for the reconstruction of the bathtub area.

The area bounded by the slurry wall along West Street, the slurry wall along Liberty Street (and its extension), the slurry wall along Vesey Street (and its extension) and the eastern property line along Church Street is approximately 19.2 acres. In addition, the master plan includes areas south of Liberty Street of approximately over 2 acres.



1. One WTC (North Tower)
2. Two WTC (North Tower)
3. Hotel
4. Four WTC
5. Five WTC
6. Six WTC (U.S. Customs House)
7. Seven WTC
8. St. Nicholas Church
9. Deutsche Bank Building
10. Milstein Parking Site

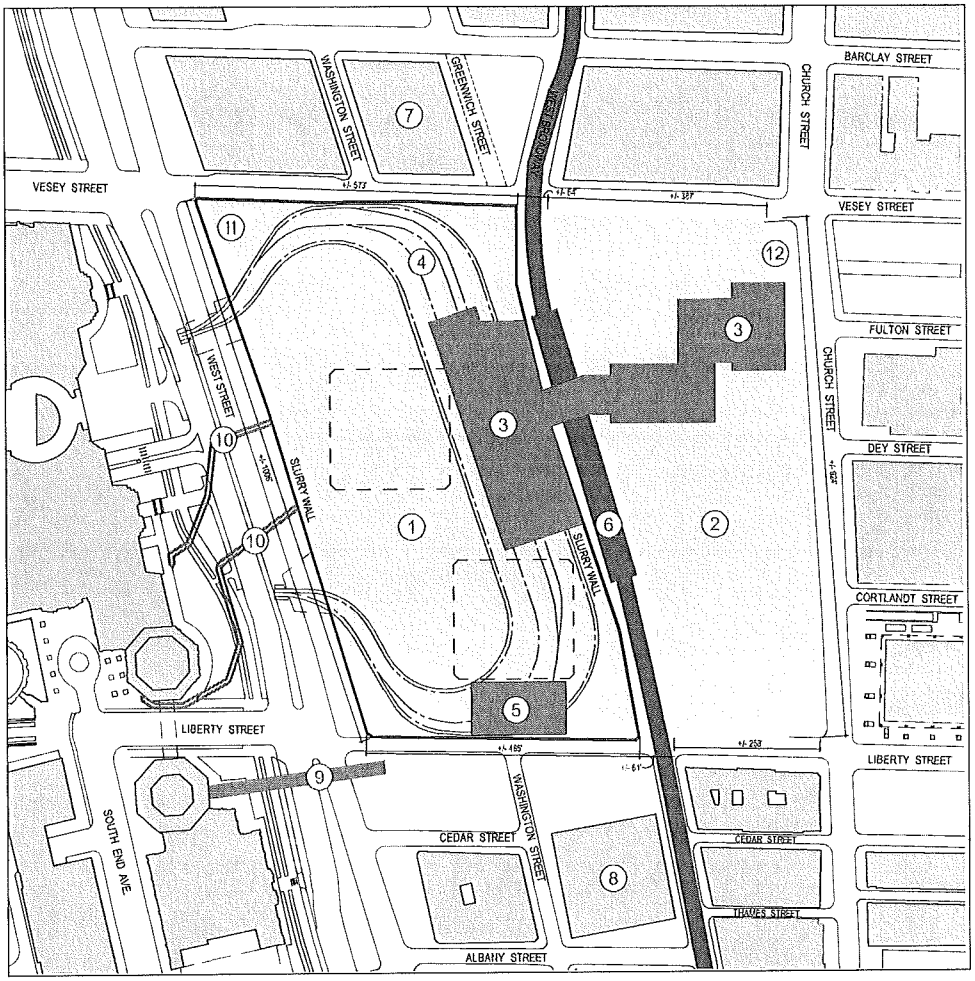
The original World Trade Center created a super block with Church and West Streets as the east-west boundaries and Vesey and Liberty Streets as the north-south boundaries. In addition, a building parcel was located just north of Vesey, between Washington and West Broadway.

The west edge of the pre-9/11 site was defined by a wide at-grade West Street. It included traffic and drop off lanes located above the slurry wall, as well as a median that accommodated ramps for sub-grade access to the WTC site.

All buildings on the site were organized on a podium that served as a raised plaza. The iconic North and South Towers were located along the south and west edges of the site. The other lower-scaled buildings, Buildings 4, 5 and 6, were organized along the north and east edges of the site which was defined by a service road. The hotel (Building 3), was located between the two towers at the southwest corner of the site. Tower 7 was located to the north of Building 6 across Vesey Street.

St. Nicholas Greek Orthodox Church was located south of Liberty Street at 155 Cedar Street on the block between West and Washington Streets. Also on that parcel was a parking lot at 140 Liberty Street. The Deutsche Bank Building is located immediately east of the St. Nicholas site on the block between Washington and Greenwich Street. The Church, the Deutsche Bank Building and the Milstein site were not a part of the original World Trade Center site.

2.3 Post-9/11 Conditions



West Bathtub (+/- 9.5 Acres) (1)
Future Bathtub (+/- 7.1 Acres) (2)
Temporary PATH Station (3)
PATHTracks (4)
Substation (5)
1 Subway (6)
7 World Trade Center (7)
Deutsche Bank Building (8)
Liberty Street Bridge (9)
River Water Lines (10)
Remnant (Parking) Slabs (11)
Access to the E Subway (12)

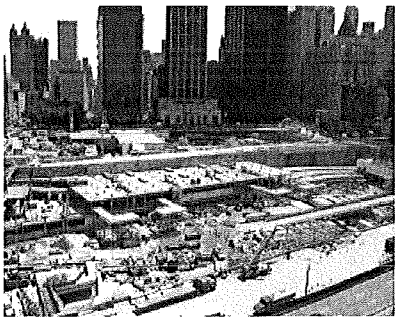
The original World Trade Center was destroyed on September 11, but it left a number of elements that have an impact on the plan for redeveloping the site.

These include:

The slurry wall: The western half of the site was excavated to approximately 70 feet below grade, to accommodate the PATH terminal and the five sub-grade levels of the previous complex. The slurry wall and excavation extended below the moving lanes on West, Vesey, and Liberty Streets. Along Liberty Street the wall was damaged and displaced horizontally; it has been reinforced with a new concrete liner. The slurry wall along West Street must be stabilized and reinforced. West Street must be realigned to coordinate with the revised site conditions.

Excavation: The area generally east of Greenwich Street was excavated only the depth required for three underground levels, and the perimeter of the excavation is located well within the site boundaries. Further excavation will be required (including the removal of the original H & M station's cofferdam) to accommodate the below grade development required in the redevelopment plan, and a new slurry wall will be needed to isolate this portion of the site from ground water.

PATH tubes: Two PATH tubes emerge from the slurry wall near the base of the excavation. This elevation is inflexible, since it is not feasible to reconstruct the tubes, and together with the headroom required for electrical equipment on the trains and depth of structure above, it establishes the elevation of the lower concourse. The PATH tracks and platform for the temporary station have been restored to the former location, pre-9/11.



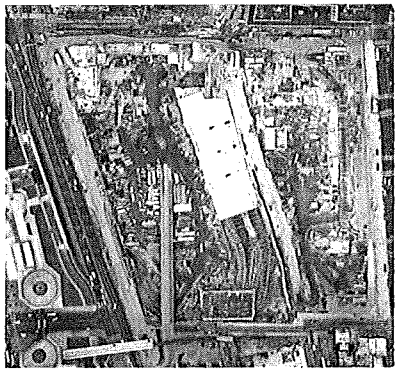
World Trade Center Site, 2003

Water intake lines: The previous center utilized river water for cooling, via four 60 inch intake and outfall lines threaded below the adjacent World Financial Center and through the slurry wall. Since these enter the site in the area of the memorial, they may need to be relocated if a similar cooling system is employed in the new World Trade Center.

Alignment of 1 subway: The 1 subway structure is supported on earth and has been reconstructed below Greenwich Street through the site. Sections of the subway will need to be underpinned when east-west connections are made between the two sides of the below-ground development. New entrances to the subway must be integrated with the development of the World Trade Center.

Deutsche Bank Building: This structure was damaged as a result of the 9/11, and will be deconstructed. The site will be added to the project site for redevelopment.

Bridges: The original World Trade Center was connected to the World Financial Center by two bridges over West Street – one originating just North of Tower 2 and landing at the Winter Garden; the second located on the south side of Liberty Street, and connecting with the rotunda of 2 World Financial Center. The South Bridge remains, and may be demolished when underground connections are created between the permanent PATH Terminal and the Winter Garden.



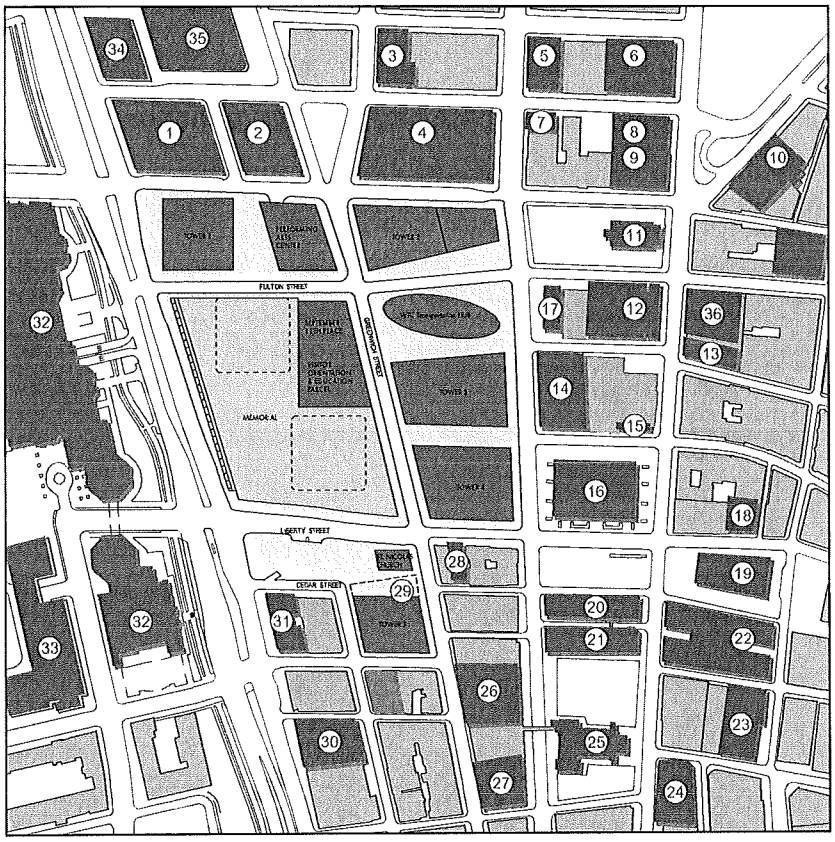
World Trade Center Site, 2003

Seven World Trade Center: This new building, located north of Vesey, was reconstructed on an accelerated timetable. The parcel for the building has been reshaped to allow the Greenwich Street alignment to continue through to the main World Trade Center site. The initial 90 feet of the structure houses a new electrical substation, replacing the station destroyed with the collapse of the original structure that occupied this site. A new public open space has been created between West Broadway and Greenwich Street.

2.4 Relationship to Context

2.4.1 Surrounding Structures

Verizon Building (1)
7 World Trade Center (2)
Dodge Building (3)
US Post Office and Federal Building 90 Church St. (4)
Dun & Bradstreet (5)
Woolworth Building (6)
St. Peter's (7)
Transportation Building (8)
Astor Building (9)
Park Row Building (10)
St. Paul's Chapel (11)
Old AT&T Building (12)
Corbin Building (13)
Century 21 (14)
Germania (15)
One Liberty Plaza (16)
Millenium Hotel (17)
Liberty Tower (18)
Marine Midland (19)
US Realty (20)
Trinity Building (21)
Equitable Building (22)
14 Wall St.- Bankers Trust Building (23)
Bank of New York (24)
Trinity Church (25)
American Stock Exchange (26)
Electric Bond Share (27)
Beard (28)
Deutsche Bank (29)
New York Evening Post (30)
90 West St.- Little Woolworth Building (31)
World Financial Center (32)
Gateway Plaza (33)
Union Hall (34)
Bank of NY (35)
Future Transit Hub (36)

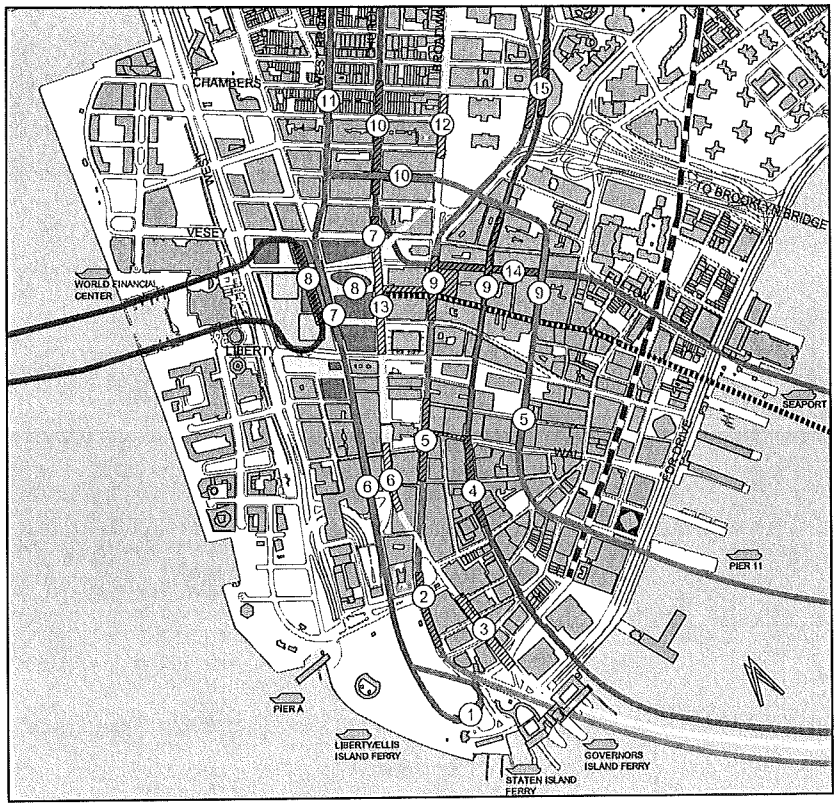


The diversity and evolution of Lower Manhattan can be understood from the structures surrounding the World Trade Center site where prominent buildings exist on every side.

Given its proximity to Wall Street and the Financial District, federal and financial institutions are abundant in the area. The US Post Office and Federal Building is directly north of the site. The American Stock Exchange is two and one half blocks to the south. Marine Midland, Bank of New York, and the Bankers Trust Building are within a few blocks to the south and east.

Evidence of nineteenth century Lower Manhattan is seen in the fabric along Greenwich Street, south of the site. Other historically significant buildings in the vicinity are the Woolworth Building to the northeast and the Barclay/Vesey building directly to the north, as well as in three religious institutions: St. Paul's, Trinity and St. Peter's Churches.

Mid-to-late century office buildings are seen east of the site at One Liberty Plaza and Marine Midland, while the vast complex of the World Financial Center lies west of the site across West Street. World Trade Center Seven stands north of the site. The Millennium Hotel stands directly east of the site along Church Street.



Path Train
Possible LIRR and Airport Connection
Proposed 2nd Ave. Line
J,M, & Z Trains
A,C, & E Trains
4,5, & 6 Trains
R & W Trains
1,2, and 3 Trains
Subway Station
Ferry Terminal
1 South Ferry Station
2 Bowling Green Station
3 Whitehall Street Station
4 Broad Street Station
5 Wall Street Station
6 Rector Street Station
7 World Trade Center Station
8 PATH Terminal
9 Fulton Street Transit Center
10 Park Place Station
11 Chambers Street Station
12 City Hall Station
13 Cortlandt Street Station
14 Broadway/Nassau Street Station
15 Brooklyn Bridge/City Hall Station

With its location in the center of Lower Manhattan, the World Trade Center site is served by every form of public transit: ferries, buses, trains and subways.

There are twelve subway stations in Lower Manhattan. Three stations are within one block from the site: World Trade Center Station, Cortlandt Street Station, and the proposed Fulton Street Transit Center (currently Fulton Street Station). The trains at these stations connect the site to the east, west, and middle of Manhattan, Downtown Brooklyn, and residential neighborhoods throughout New York City. The 4 & 5 lines stop at Fulton Street and continue up the east side of the island. The W & R lines stop at Cortlandt Street and serve the middle of the island. The A,C & E lines stop at World Trade Center and serve the west side of the island. The west side 1 line will once again stop at the World Trade Center as part of the future redevelopment.

Bus lines run north on Church and south on Broadway and also along West Street with stops nearby. Ferries dock just a few blocks away near the World Financial Center on Vesey Street and at the southern tip of the island where they serve commuters from Staten Island and New Jersey, and visitors to Liberty, Ellis, and Governors Islands.

The site will again become a major transportation hub with the completion of the new WTC Transportation HUB. The PATH trains will transport thousands of daily commuters between New York and New Jersey, making the World Trade Center a prominent gateway to Lower Manhattan. A possible connection to Long Island Rail Road and area airports is currently being studied.

2.4.3 Pedestrian Movement

Major Pedestrian Routes

World Financial Center Winter Garden (1)

City Hall (2)

Battery Park (3)

Battery Park City - North (4)

Battery Park City - South (5)

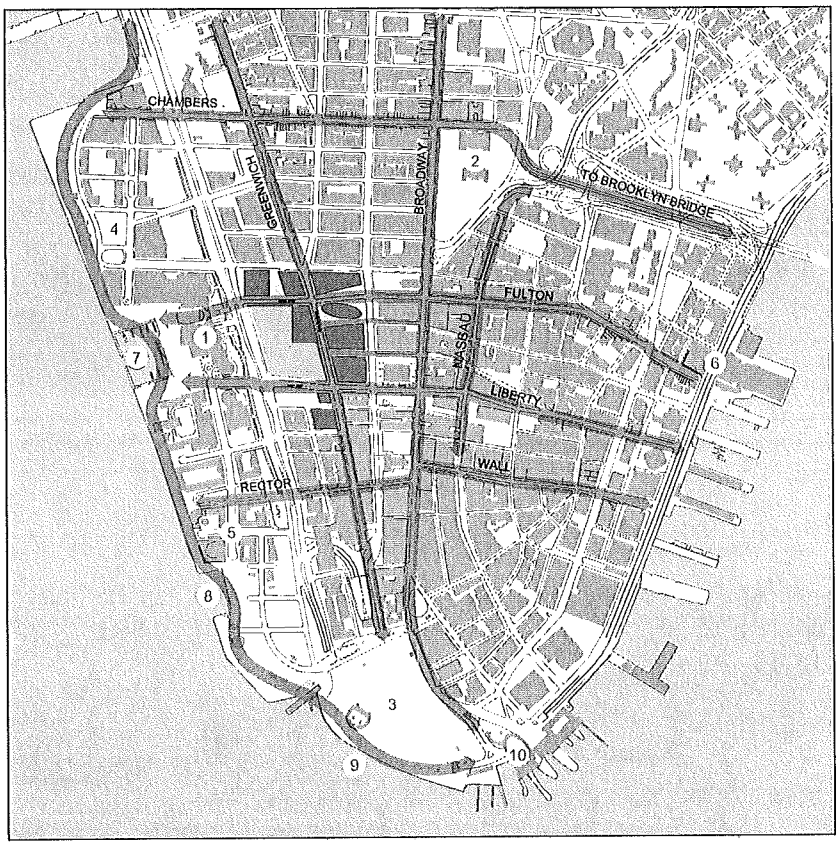
South Street Seaport (6)

North Cove (7)

South Cove (8)

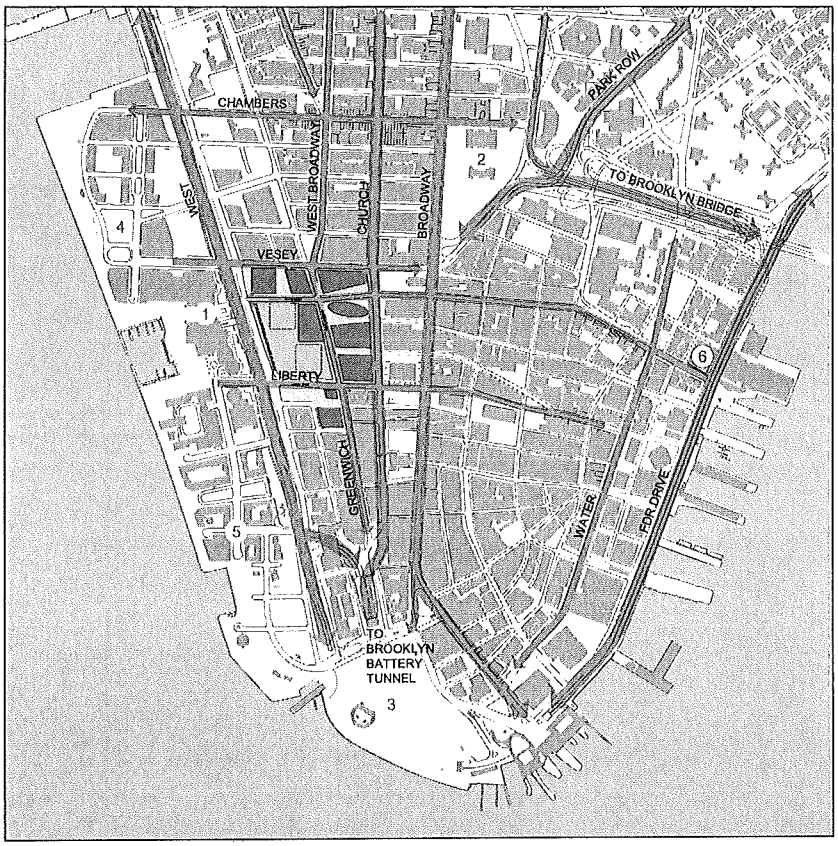
Statue of Liberty / Ellis Island Ferry (9)

Staten Island Ferry (10)



While Lower Manhattan has one of the densest collections of transportation lines in the world, ultimately all users of this vast transportation network will become pedestrians. Movement of all pedestrians is vital to the life of Lower Manhattan. Because subway patterns are primarily north-south, east-west movement for pedestrians is of particular importance.

The new World Trade Center plan re-introduces Fulton Street and enhances Liberty Street providing two vital river-to-river connections for pedestrians. Special significance is given to Fulton Street as a linkage to public spaces including North Cove, the Winter Garden at the World Financial Center, St. Paul's Church, City Hall Park and South Street Seaport. East-west connections link the north-south corridors like Hudson River Promenade, Broadway, Broad and Greenwich Streets. Additional discussion of pedestrian movement occurs in Chapter 4 and Chapter 6.



Primary Vehicular Routes

Secondary Vehicular Routes

1. World Financial Center Winter Garden
2. City Hall
3. Battery Park
4. Battery Park City - North
5. Battery Park City - South
6. South Street Seaport

North-south arteries like West Street, Greenwich Street, FDR Drive, Broadway and Trinity Place/Church Street support multiple vehicular transportation modes (buses, trucks, and auto). These routes connect Lower Manhattan with the rest of the island and to tunnels and bridges going to New Jersey and Brooklyn. Liberty Street, closed since 9/11, will accommodate trucks arriving to the World Trade Center site and other vehicles continuing east into the Financial District. Vesey Street, also closed since 9/11, will accommodate east-bound vehicular circulation for vehicles arriving from West Broadway, Church and Broadway. Fulton Street will be reestablished and will be an important vehicular and pedestrian link between Church Street and Battery Park City. It will also provide an important connection between the Brooklyn Bridge and West Street (paired with Barclay one block north and Fulton one block south). Additional discussion of vehicular movement occurs in Chapter 4 and Chapter 6.

GOALS & OBJECTIVES 3

A project as complex as the redevelopment of the World Trade Center demands a clear articulation of uses, as well as a clear course. This section discusses the history of the planning process and the program of uses that serve as the foundation for the project. It also outlines the goals, objectives and guiding principles that underpin these design guidelines.

Planning Process 3.1

Revitalizing Lower Manhattan 3.2

Program of Uses at the World Trade Center 3.3

World Trade Center Master Plan Guiding Principles 3.4

3.1 Planning Process

On February 27, 2003, Governor George Pataki and Mayor Michael Bloomberg announced that the master plan proposed by Studio Daniel Libeskind was selected the winner of the Innovative Design Competition for the World Trade Center site. This announcement culminated a seventeen-month process in which hundreds of thousands of people from across the world offered their ideas, opinions, and comments on how this site should be redeveloped. No other project had ever attracted so much attention, emotions or debate; no master planning process had ever been subject to as much public scrutiny.

The announcement concluding the competition process was just the beginning of the detailed planning required to establish the plans for the World Trade Center. Publication of this document represents another milestone in that process, and culminates a one and one half year effort of refining, reconciling, and re-affirming the master plan. The participation and contributions of many parties has been critical to these efforts, particularly those of the Port Authority, the LMDC, the City of New York, and the leaseholders of the World Trade Center site.

These design guidelines, coupled with the Memory Foundations Master Plan, have been responsive to the broad spectrum of stakeholders, representing widely disparate needs and priorities. As with any project in the public realm, developing and maintaining a consensus on the key development issues is difficult, and the timing of decisions has its own logic. Accordingly, certain aspects of the plan will undoubtedly change over time. As detailed design and engineering proceeds, new information will be uncovered that may suggest alternative approaches. Thus, the planning process will continue beyond the publication of these design guidelines, and refinements will need to be made over time to account for new issues that arise.

Any changes to the WTC Memorial and Redevelopment Plan and any related changes to the Record of Decision and Findings Statement (ROD) or LMDC's General Project Plan will be reflected in the corresponding changes and admendments to the WTC Design Guidelines.

The guidelines that follow are based on an overall program for the site, based on careful studies on what can be accommodated, and what is necessary to re-establish the World Trade Center as the heart of a thriving Lower Manhattan.

The goals and objectives of the World Trade Center master plan are based on the findings of the LMDC's extensive process of consulting with citizens, stakeholders, interested parties, and those who will be affected by the redevelopment process. These are documented in its *Principles and Revised Preliminary Blueprint for the Future of Lower Manhattan*, issued in December 2002.

Respect the site of the World Trade Center as a place of remembrance, and reserve an area of the site for one or more permanent memorials.

Promote the continued revitalization of Lower Manhattan to ensure its long-term viability.

Promote retail and commercial opportunities that support Lower Manhattan as a vibrant place with daytime and nighttime activity.

Restore elements of the street grid that will reintegrate the World Trade Center site with other areas of Lower Manhattan.

Eliminate West Street as a barrier between the World Trade Center and Battery Park City.

Coordinate mass transit services to provide a coherent integration between Lower Manhattan and the rest of the city and region.

Create a distinctive transit hub linking PATH, subway, and future regional rail service as a gateway to Lower Manhattan.

Create downtown facilities to accommodate the anticipated surge in charter, tour, and public buses, and explore the opportunities for off-street vehicular and service access.

Expand the residential population and enhance residential life to create a strong sense of community throughout Lower Manhattan.

Provide for new or expanded cultural and civic institutions in Lower Manhattan.

Create an accessible, attractive, and comprehensive park and open space system for Lower Manhattan.

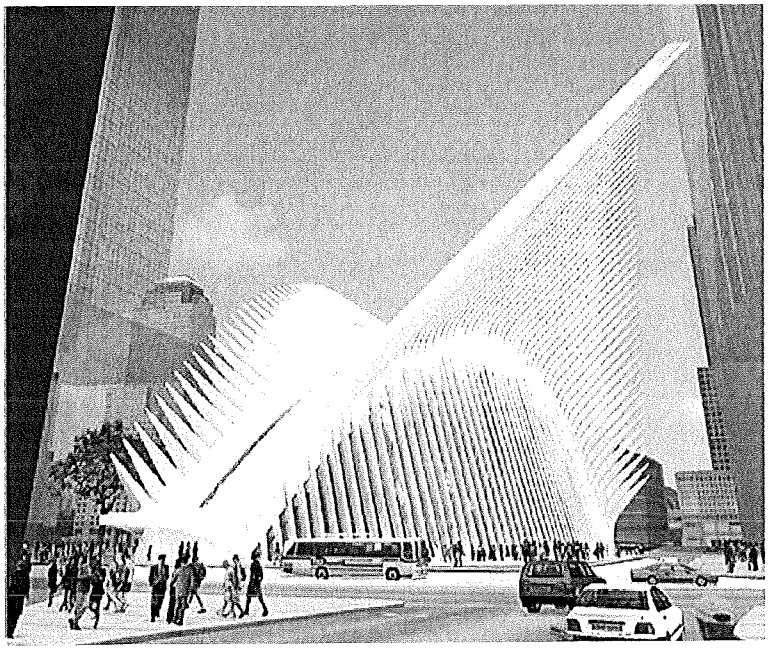
Support sustainable design, "green building" technology, state-of-the-art safety and security in design and engineering, and accessible design features.

Support excellence in design to ensure the creation of a location that is a symbol of New York City recognized around the world.

Encourage preservation of outstanding historic structures and the cultural value of the cityscape.

Develop Lower Manhattan, not only with a revived and strengthened financial services/Wall Street economy, but with new centers of economic activity.

Program of Uses at the World Trade Center Site 3.3



The site should accommodate:

Retail Space

Approximately 600,000 gross square feet, with approximately half of that area at street level or above. Locations for anchor stores are desired. Opportunities for multi-story retail spaces above ground are desirable.

Hotel

Up to 800 room Hotel and up to 150,000 SF Conference Center.

Performing Arts Center

Venue or venues for theater, music, dance, film, and other cultural functions. Approximately 250,000 – 300,000 square feet must be accommodated.

Commercial Office Space

At least 10 million square feet of above grade Class A office space, in five towers, capable of being phased over time.

Visitor Orientation and Education Center

Memorial-related visitor orientation spaces and services, including amenities and site information; and educational program spaces. Up to 100,000 square feet.

Parking

Subgrade car parking for a minimum of 1300 cars serving commercial office space.

Subgrade bus parking for 80 buses.

Service Areas

Below-grade mechanical, including central chiller plant, electrical substations etc., ventilation, transfer station, off-street truck loading, dumpster, and recycling spaces serving office, retail, museum, performing arts, and memorial uses.

Vehicular Security Screening

Space adequate for security screening of all trucks, buses, vans, and cars entering the site.

In addition to the program of uses listed above, the following transit facilities shall be built independent of the Memorial and Redevelopment Plan.

Transit Facilities

- PATH: tracks, a four-platform configuration for passenger loading and off-loading, a dedicated mezzanine, exits, refuge areas, and related service areas, including spaces for electrical, mechanical and ventilation equipment.
- Transit Hall and Terminal: a new Lower Manhattan Station providing a memorable point of access to PATH facilities, connections to subways, facilities for taxi drop off and queuing space and shopping opportunities. The terminal may incorporate retail spaces at multiple levels to enliven the space. Additionally, it should include a provision for future Long Island Rail Road and airport access.
- Concourses: pedestrian concourses providing underground connections to and between transit facilities. These should accommodate both east-west and north-south patterns of movement. Pedestrian flow in both directions should intersect in the terminal building.
- Subway: connections to existing lines (1, W&R, E) and enhancements to platforms, street connections, support spaces and connections to the MTA Transit Hub.

World Trade Center Master Plan Guiding Principles 3.4

The following nine guiding principles are at the heart of the Memory Foundations Master Plan as developed by Studio Daniel Libeskind. These principles were established at the beginning of the Master Planning process to make clear the fundamental objectives of the project. Though the plan will certainly evolve over time, these principles will remain as core objectives for the redevelopment of the World Trade Center.

1. Create a respectful relationship between the memorial experience and resurgent life in Lower Manhattan.

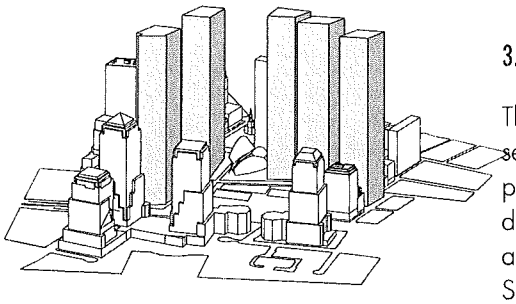
The site presents a difficult dichotomy: the need to host a powerful and reverent memorial experience, while also stimulating the lively and vibrant urban experience one expects in an important center of New York. The master plan must organize the environment so each of these experiences can be fully realized. Specifically:

- Locate public buildings so that they serve as a protective filter to the memorial experience.
- Locate open space adjacent to the memorial to provide additional separation.
- Preclude the presence of uses directly adjacent to the memorial that could detract from its solemn nature.

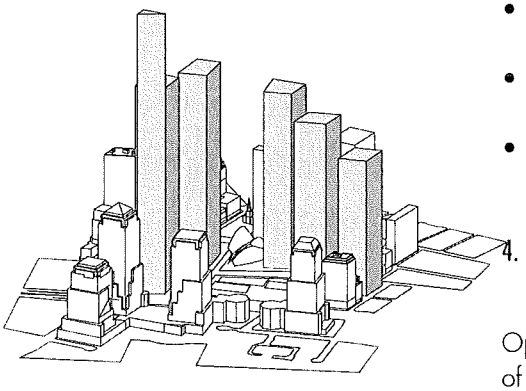
2. Define the memorial experience

The memorial experience should be separated from the bustle and noise of street level activity. A portion of the existing slurry wall on the western edge of the site should be exposed, serving as a metaphor that the foundations of this site, as well as the foundations of democracy, survived the September 11 attack. Specifically:

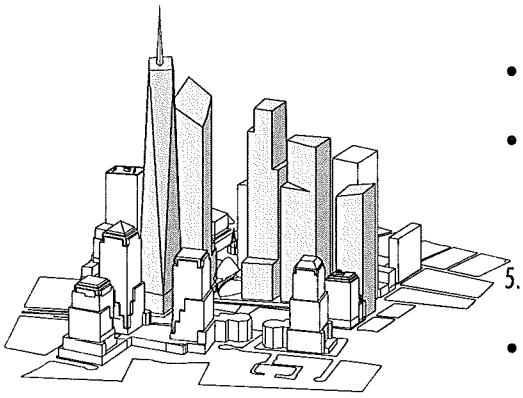
- Create a section of the memorial with access to bedrock, so the full height of the slurry wall can be experienced.
- Respect the footprints of the original twin towers, and represent them in the memorial site.



Five towers mark the restored street grid and encircle the memorial precinct...



the spiraling composition created by their ascending heights creates a distinctive identity for the site...



and the towers' massing enhances light and views across the site.

Diagrams illustrative only.

3. Re-connect the World Trade Center site with the rest of Lower Manhattan.

The design of the former World Trade Center was inwardly focused, and separated from surrounding areas by a perimeter service road. Its superblock plan concentrated vehicles around the perimeter of the site, making access difficult, and severed several key streets. The redeveloped site should restore a portion of the street grid and facilitate pedestrian movement through the site. Specifically:

- Restore Greenwich Street as a significant north-south artery through the site.
- Restore Fulton Street as a pedestrian-scaled east-west street through the site while providing vehicular connections to lower Manhattan.
- Develop Cortlandt and Dey as pedestrian connections between Church Street and Greenwich Street.
- Design individual parcels and buildings to optimize pedestrian permeability.
- Create underground concourses that provide commuter access to transportation facilities.

4. Create a range of open spaces that can accommodate a wide variety of activities, while providing relief from the density of the site development.

Open spaces are critical for urban livability, particularly in the dense surroundings of Lower Manhattan. The World Trade Center should include a series of open spaces that offer a diversity of experiences and settings, while creating a sense of continuity for those moving through and around the site. Specifically:

- Establish the Wedge of Light Plaza as an active, urban gateway to the site from the east, and as a connection to the Memorial. Utilize the September 11th solar angles at 8:46 am and 10:28 am to establish the geometry of the Wedge of Light.
- Establish September 11th Place as a threshold to the memorial experience.
- Provide Liberty Park as a community park at the southern edge of the memorial, and to offer a generously landscaped connection from Battery Park City to the rest of Lower Manhattan.

5. Create state of the art retail and office spaces

- Encourage development of commercially viable and architecturally iconic office towers vital to the economic future of Lower Manhattan.
- Create a world class retail destination that encourages vibrant daytime and evening activity.
- Create an inviting environment that supports state of the art life safety and security standards.

6. Celebrate the vitality of New York through the creation of interesting and dynamic streetscapes.

Specifically:

- Create a pedestrian-scaled public environment through the definition of streetwalls and with humanly scaled elements in the public spaces and streetscapes.
- Employ a unified palette of landscaping, paving, lighting and furnishings to create a distinctive appearance throughout the site.
- Activate the street by showcasing the range of cultural, commercial and civic uses at the ground level and maximizing ground floor retail space.
- Frame significant urban vistas through the thoughtful orientation of streets, buildings and landscape elements.
- Provide visible and convenient connections between the street and transit concourses below grade.

7. Restore the skyline of Lower Manhattan.

The Twin Towers were landmarks on the New York skyline, and their absence leaves emptiness in their wake. The redevelopment of the World Trade Center presents the opportunity for a new statement on the skyline – one that is equally recognizable, respectful of the past, yet better scaled to its context. Specifically:

- Create an identity for the World Trade Center on the skyline by organizing the massing of the towers in a cascading spiral.
- Orient the towers so they acknowledge and encircle the void left by the absence of the Twin Towers.
- Create tower silhouettes that clearly relate to each other and that offer a clear, consistent identity to the World Trade Center.

8. Develop Tower 1 as an iconic symbol.

The tallest of the new buildings on the site, the Freedom Tower, should take its place among great American skyscrapers as a lasting symbol of our country's strength, enterprise, and belief in freedom. Specifically:

- The building marks the symbolic height of 1776 ft.
- The building is the culminating point of the spiraling composition of towers on the site.
- The building and its spire reflect and complement the geometry of the Statue of Liberty and the Torch of Freedom.
- The building's spire rises on the western edge of the site, making it visible the full length of Manhattan from the Hudson River Boulevard (Route 9A).

9. Develop cultural and transit buildings that reinforce the civic importance of the site.

The World Trade Center site is more than a collection of commercial buildings. It represents a new center woven into the context of Lower Manhattan. As such, it should include public buildings that are important to residents, commuters, and visitors. Specifically:

- Develop visitor/educational and performing arts facilities that are catalysts for cultural uses on Fulton Street and throughout Lower Manhattan.
- Create a dynamic, light-filled WTC PATH Terminal that offers Lower Manhattan a great hall akin to Grand Central Terminal.
- Create sites for cultural and transit buildings so that each can have unique and memorable building forms, rather than seeming as portions of larger buildings.
- Cluster public buildings at the intersection of Greenwich and Fulton, adjacent to September 11th Place, thereby creating a cultural nexus at this important focal point of the site.

Artist's conception,
Skyline from Statue of Liberty

OVERALL SITE DEVELOPMENT GUIDELINES 4

The plan for redeveloping the World Trade Center site is guided by the overall principles articulated in Section 3.4. Above all, the site must become the center of a new Lower Manhattan mixed-use district integrating premier commercial office, retail and cultural uses all focused around the Memorial. This area must be both unique and coherent in its own right. This section of the design guidelines articulates the urban design and architectural framework for the site, which will set the context for the development of individual parcels and open space sites.

The Memorial and the Memorial Museum 4.1

The Street Grid, Traffic and Pedestrian Movement 4.2

Urban Form of Public Open Spaces 4.3

Urban Form of Built Spaces 4.4

Below Grade Form and Use 4.4.1
Street-Oriented Form and Use 4.4.2
Form of Towers 4.4.3
Materials 4.4.4
Lighting 4.4.5
Façade Expression 4.4.6

Parcels, Sites and Uses 4.5

Use Plan 4.5.1
Vertical Organization of Uses 4.5.2

Cultural Uses 4.6

Transit Network 4.7

Commercial Retail Uses 4.8

Commercial Office Uses 4.9

Commercial Hotel/Retail/Mixed Uses 4.10

Access to Underground Service and Parking 4.11

Access to Concourses and Transit 4.12

Below Grade Service, Loading, Parking and Storage 4.13

Distribution of Uses 4.13.1
Servicing Requirements 4.13.2
Tenant Parking Requirements 4.13.3
Storage 4.13.4

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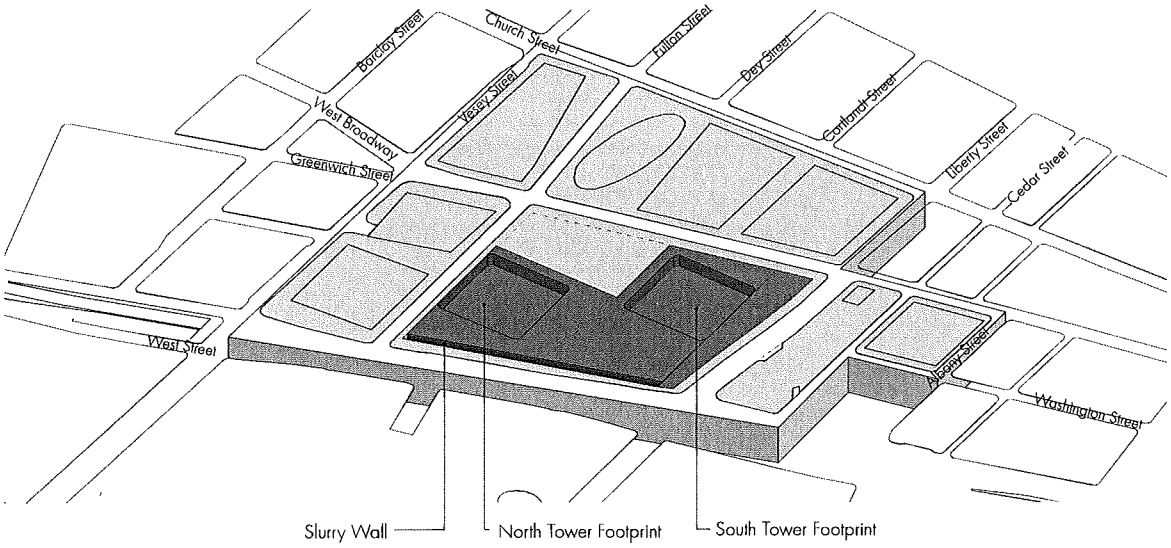
4.1 The Memorial and The Memorial Museum

Exemption (4)

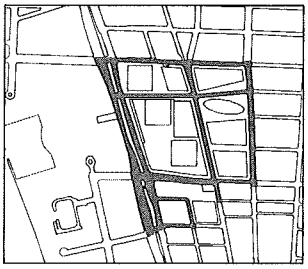
A Memorial will be at the heart of the new World Trade Center. Within it, the footprints of the two original towers will be delineated in remembrance of the individuals who lost their lives on September 11, 2001, and those who died in the earlier attack on the World Trade Center on February 26, 1993. The LMDC held an open international competition that inspired 5,201 entrants.

"Reflecting Absence" by Michael Arad and Peter Walker was selected by an independent 13 member jury in January 2004. The accompanying diagram shows the possible main pedestrian arrival routes and movement patterns around the memorial. The Memorial can be accessed from each of its four sides. The Memorial design includes a tree-filled plaza at-grade with two large voids containing recessed pools. These pools and the surrounding structures encompass the footprints of the twin towers. The pedestrian experience at the plaza is intended as a contemplative public space, serving as a transition between the busy city life around it and the Memorial, which occurs primarily below-grade. Visitors will circulate downward to arrive in the below-grade Memorial space, which will include the list of names of those killed on February 26, 1993 and September 11, 2001, areas for reflection, as well as a space for unidentified remains. Below-grade the Memorial will also include access to bedrock for family members.

In addition to the Memorial pools, below-grade visitors will also experience the Memorial Museum, which will house artifacts from the original World Trade Center. Access to bedrock for the general public will be from the Memorial Museum.



4.2 The Street Grid, Traffic and Pedestrian Movement



The World Trade Center site is intended to be porous and create as many pedestrian and vehicular connections to surrounding neighborhoods/districts as possible. The plan accordingly extends streets into and across the World Trade Center site, reconnecting it to the neighborhoods to the north, south, east and west. These streets, which once ran through the site, will help to restore pedestrian and vehicular patterns in the area and provide the fabric of ground level uses that stimulate urban vitality. The new center of the site will become the intersection of Greenwich and Fulton Streets, where cultural, civic, open space, transit and commercial uses converge.

Lively streetscapes are anticipated and encouraged on the site. In order to optimize the pedestrian experience, minimum sidewalk widths of 25 feet will be implemented throughout the Site, except that:

- Sidewalks along the northern edge of the Memorial Site along Fulton Street west of Greenwich Street shall be 15 feet.
- No sidewalks shall be required along Cortlandt Street in view of the anticipated use of that street as a pedestrian street and gateway to the Memorial.
- The widths of sidewalks on the Southern Site will be subject to future discussion between the Port Authority and the City, but will be a minimum of 15 feet.

Given the pedestrian-oriented nature of program uses, which will be predominated by retail except on Greenwich Street, streetscapes should accommodate pedestrian use, movement, comfort and safety.

The streets that bounded the pre-9/11 World Trade Center (Church Street, Vesey Street, Liberty Street and West Street) will be restored to once again serve the site and Lower Manhattan. Church Street, presently in service, will continue to carry northbound traffic with heavy volumes in the morning and evening rush hours, and will include a bus lane along its eastern curbline.

Vesey Street will be restored to accommodate east-bound traffic, and will once again provide vehicular access to the Brooklyn Bridge.

Fulton Street, as one of the few streets in Lower Manhattan that extends east-west across the island, will be re-established across the World Trade Center site to accommodate westbound vehicular movement. Accordingly, Fulton Street on the World Trade Center site is designed to allow pedestrians to circulate between these and other open spaces along the Fulton Street corridor (St. Paul's Chapel and graveyard, the World Financial Center Winter Garden, and the Hudson River esplanade).

Greenwich Street, one of the oldest streets in New York and once the western edge of Lower Manhattan, will be extended through the site. It will provide south-bound vehicular movement and connect the emerging residential district south of the World Trade Center with the Tribeca neighborhood to the north. Greenwich Street will serve primarily local traffic accessing the new World Trade Center and the neighborhood immediately south.

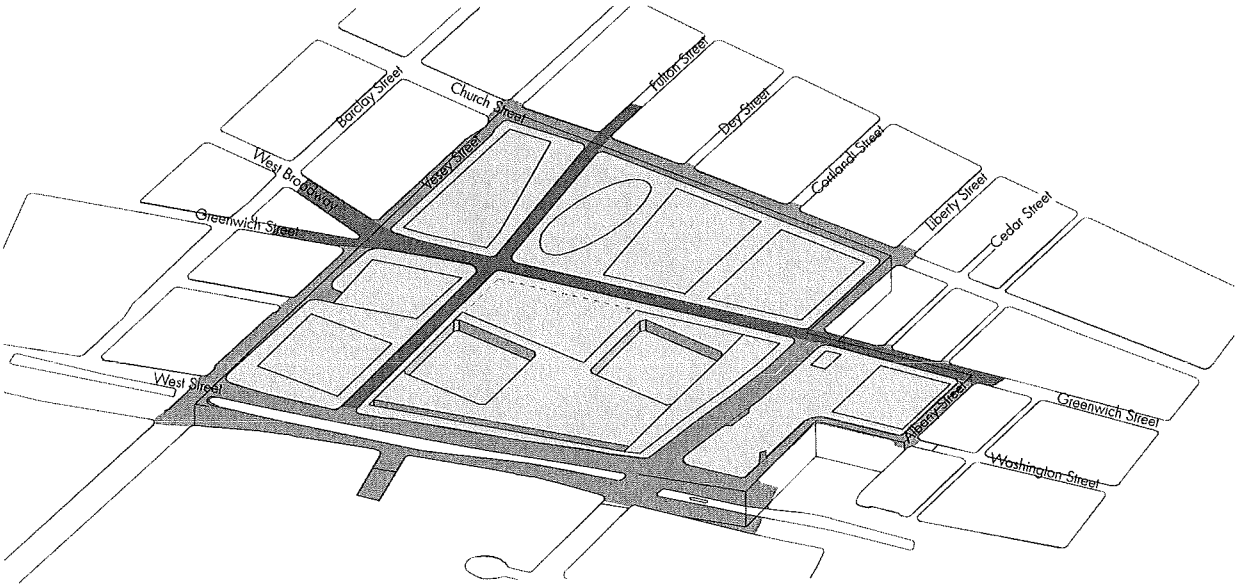
Route 9A / West Street will be restored along the western edge of the site to accommodate high volumes of north-south vehicular movement. It will also be reconfigured along the western edge of the site, creating a more pedestrian friendly environment by allowing easier ground level crossings. The sidewalk along West Street should have a minimum width of 25 feet. West Street will be reconstructed in an at-grade configuration.

Cortlandt and Dey will be established as pedestrian connections from Church Street to Greenwich Street to help connect the cultural and memorial precinct to the financial district. Cortlandt will provide important retail frontages.

Liberty Street will be restored to accomodate traffic in both the east-bound and west-bound directions.

Cedar Street will remain in its current alignment between Washington and West Streets. It may accommodate a drop-off area for Tower 5 between Greenwich and Washington Streets.

Albany Street will remain in its current alignment.



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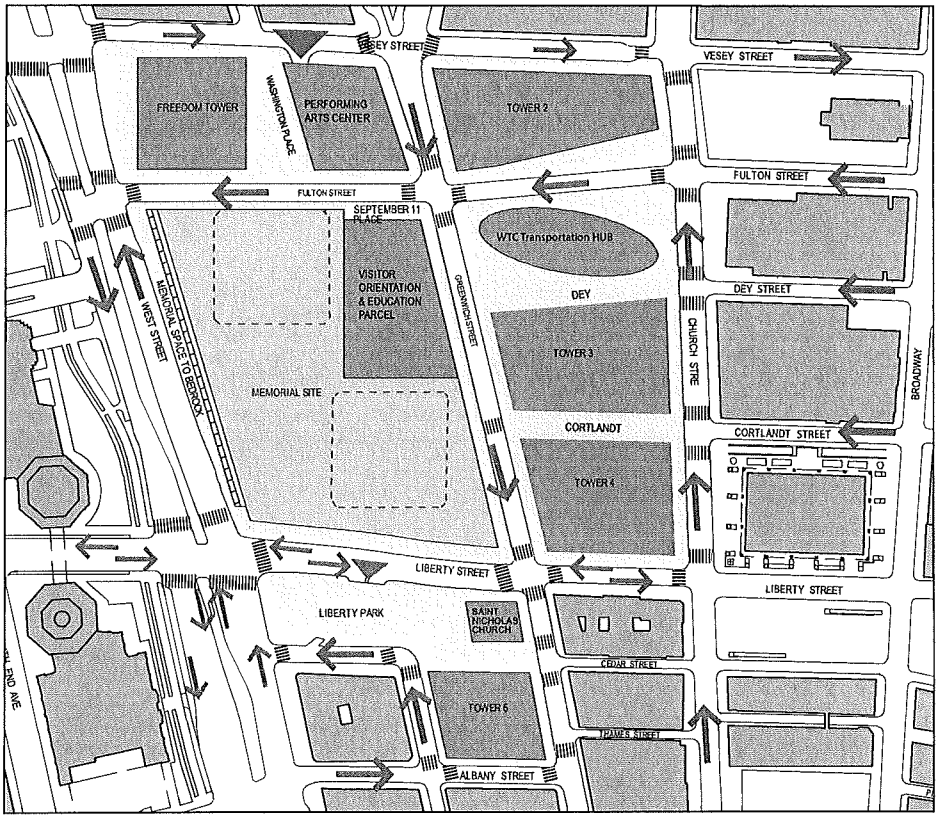


Direction of Traffic Flow

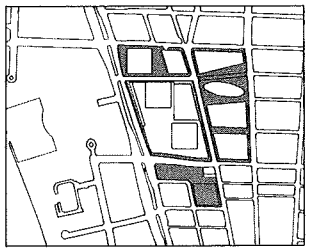
Access to Underground Services

Pedestrian Street Crossing

Washington Street will continue to accommodate pedestrian movement and local northbound vehicular traffic south of Cedar Street.

In addition to generous, active streetscapes on the World Trade Center site, a variety of open spaces are created on the site for pedestrian movement and use. These spaces should accomodate uses that vary depending on the time of day, week and year. Some spaces, such as the Wedge of Light Plaza, are designed to be flexible; they may be reconfigured to accommodate activities of diverse nature and size. Detailed descriptions of streetscapes and public open spaces are provided in Section 6.

Urban Form of Public Open Spaces 4.3



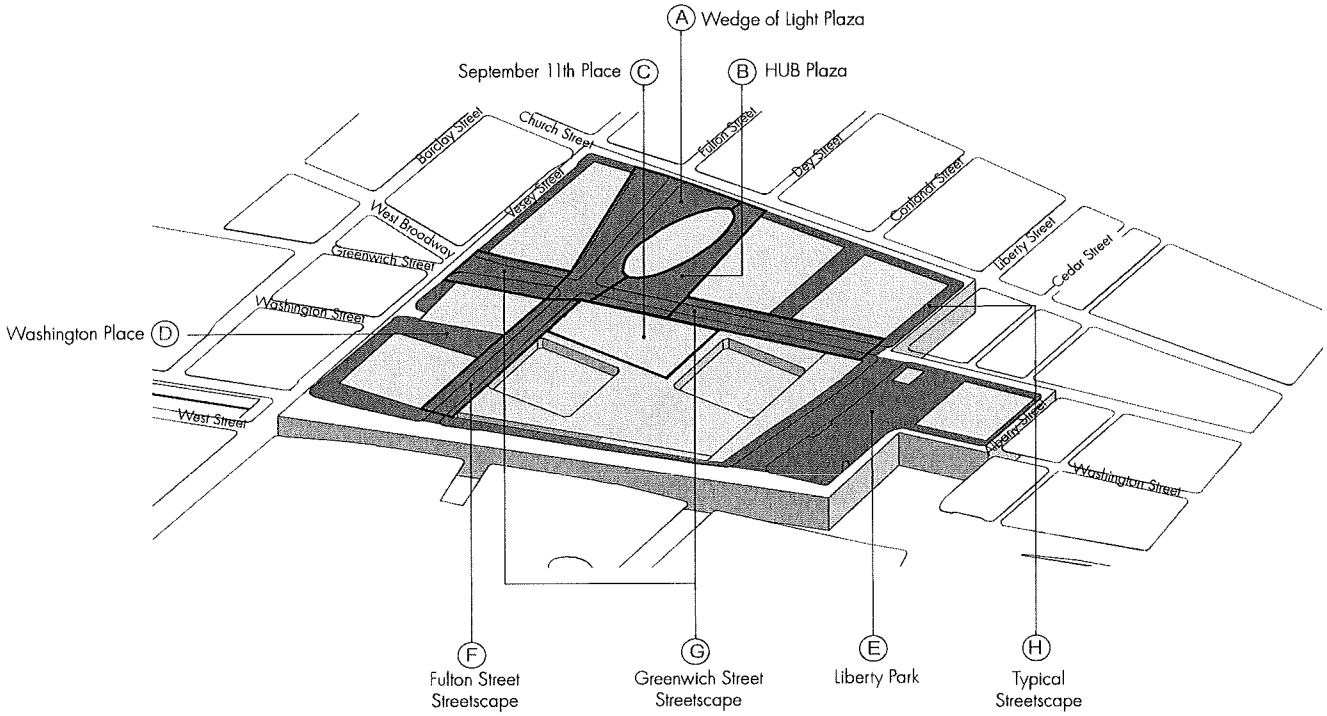
Public open spaces should be designed with a unified approach, giving the site a cohesive identity. Within this larger framework, public open spaces have been identified as Sites A-F, each with a distinctive character.

1. The Fulton Street corridor (encompassing the Wedge of Light Plaza/Site A, HUB Plaza/Site B, September 11th Place/Site C and Washington Place/Site D)
These spaces form the civic spine of the site and connect the World Financial Center and its Winter Garden to St. Paul's Chapel and the Financial District. Guidelines for these sites are described in detail in Section 6.2.

2. The open space along the south side of Liberty Street (Liberty Park/Site E) This space offers an opportunity to create a public park serving the World Trade Center as well as the emerging mixed-use residential neighborhood to the south. Guidelines for Site E are described in detail in Section 6.3.

3. Unique Streetscapes (Fulton Street/Site F, Greenwich Street/Cortlandt/Site G)
Fulton and Greenwich Street are considered unique streetscapes within the World Trade Center Site. Guidelines for "unique" streetscapes are described in detail in Section 6.4.

4. Typical Streetscapes (All other streetscapes/Site H)
These will be the connective tissue between the World Trade Center site and its surroundings. Guidelines for "typical streetscapes" are described in detail in Section 6.4.



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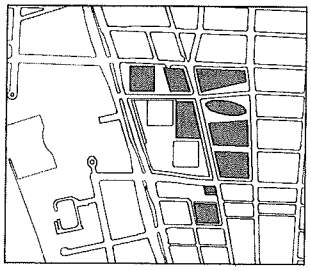
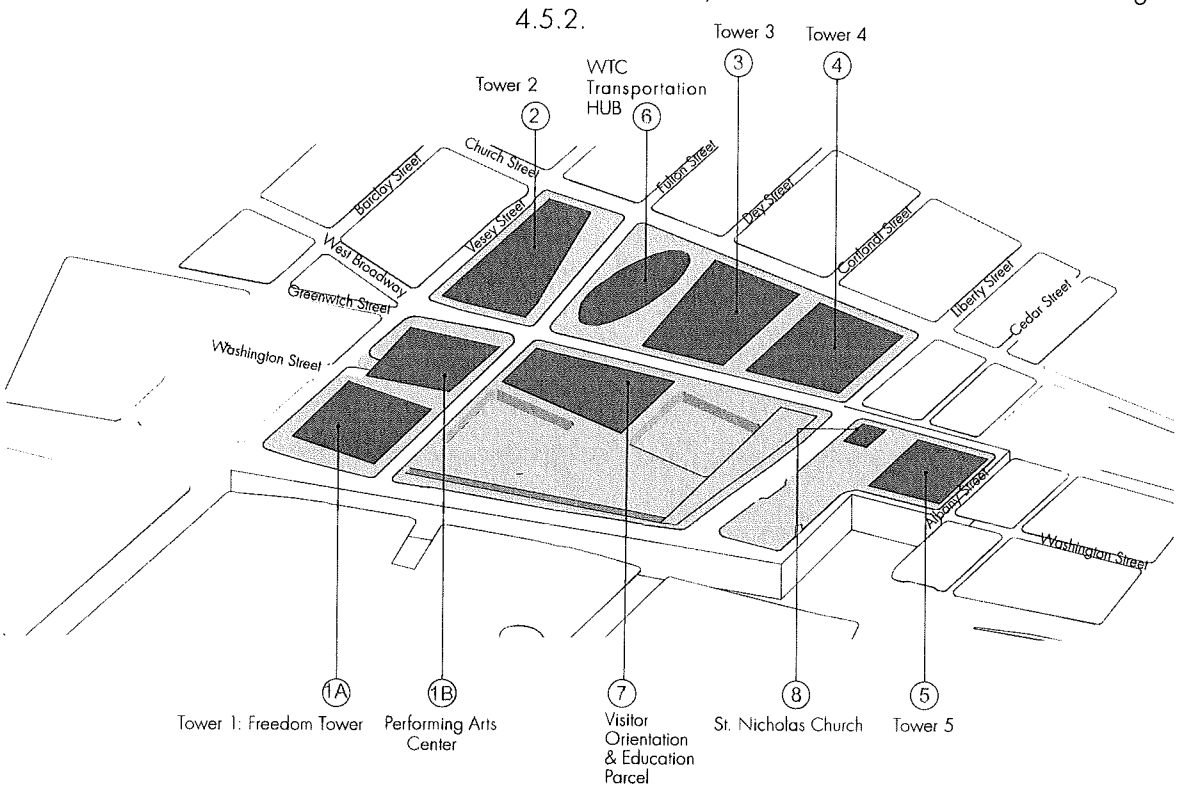
4.4 Urban Form of Built Spaces



The urban form of the site is the result of a careful reading of the context of the surrounding city, the shape and topography of the site, and the demands of the types of uses it must accommodate. Orientation, sunlight and wind patterns, pedestrian flows, the desire to restore the skyline, the desire to break down the superblock, and the logistics of reconstructing the site over time also played a major role in shaping the redevelopment plan. The guiding principles for the site can be found in Sections 3.4 and 6.1.

The form of the site has both a horizontal and a vertical logic. Horizontally, it responds to the need to separate the Memorial from the commercial uses, to the desire to create a prominent WTC Transportation HUB Terminal entrance on the east side of the site, to create streets with continuous lines of activity, and to space tall structures as far apart as possible to preserve views, light, and air. Building sites are organized into Parcels 1-8 as shown below. Five of the parcels are for office and retail uses (1A, 2, 3, 4 and 5). Parcel 6 is intended for the new WTC Transportation HUB. Three of the parcels (1B, 7 and 8) are allocated for cultural or religious (reconstructing St. Nicholas' Church) uses. The distribution of these uses is discussed in detail in Section 4.6.

Vertically, the complex will consist of a series of strata: below grade; street oriented; and towers. Retail uses will be maximized in the street oriented strata where feasible and in the below-grade concourses. Office building entries will be located on Greenwich Street. Office and potentially hotel uses will rise above the retail layer. The vertical distribution of uses is diagrammed in Section 4.5.2.



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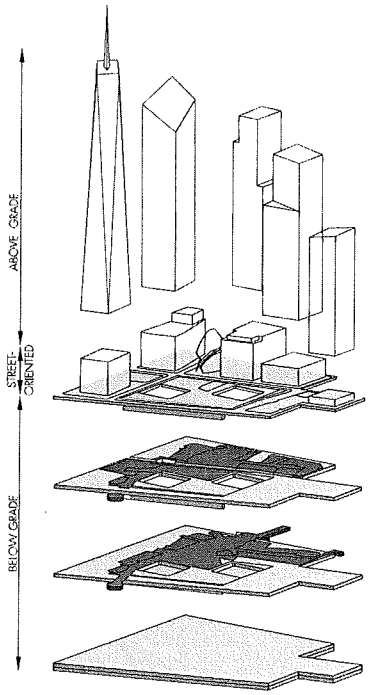
The underground space is organized into four subgrade levels, closely coordinated with the PATH lines, transit lines and concourses, memorial precinct, and essential site infrastructure. The plan seeks to optimize the productive commercial area below ground, while accommodating as efficiently as possible vehicular flows, pedestrian circulation, and mechanical needs. It reflects the commitment to distance commercial spaces from the memorial.



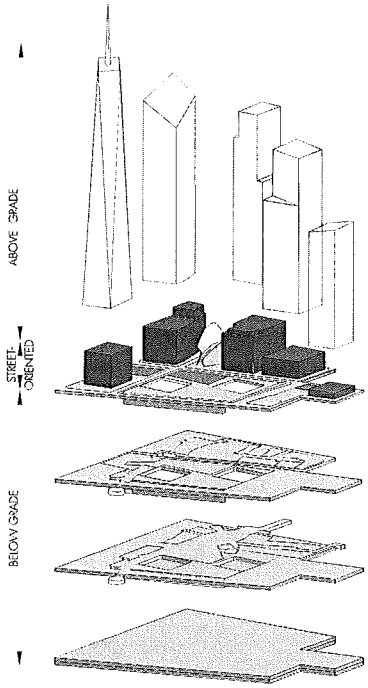
The WTC Transportation HUB Terminal including the underground concourses, on Levels B1 and B2, are designed to seamlessly connect the many transit lines in the area. A major pedestrian concourse will extend from the Fulton Street Transit Center on the east to the World Financial Center on the west. North-south circulation is organized in a second below grade spine between Greenwich and Church Streets. The two major concourses will converge at the WTC Transportation HUB at the center of the site – a generous daylight filled space that will provide orientation and relief for the thousands of commuters and visitors who use the underground areas each day. The concourses will be lined with a broad mix of retail shops, catering to commuters, visitors, and residents of Lower Manhattan and may provide connections to the commercial towers.

Underground levels B3 and B4 will be devoted to the PATH platforms, mezzanine, PATH retail and operating space, security zones for vehicles entering the complex, truck and bus circulation and loading areas, tenant parking, tenant storage, service spaces and mechanical spaces.

Guidelines for below-grade commercial spaces on Levels B1 and B2 are described in detail in Section 7.

In the Memorial precinct, visitors will have access to two large pools at the original World Trade Center tower footprints as well as the Memorial Museum below-grade. In some areas of the Memorial, access will be provided to bedrock.

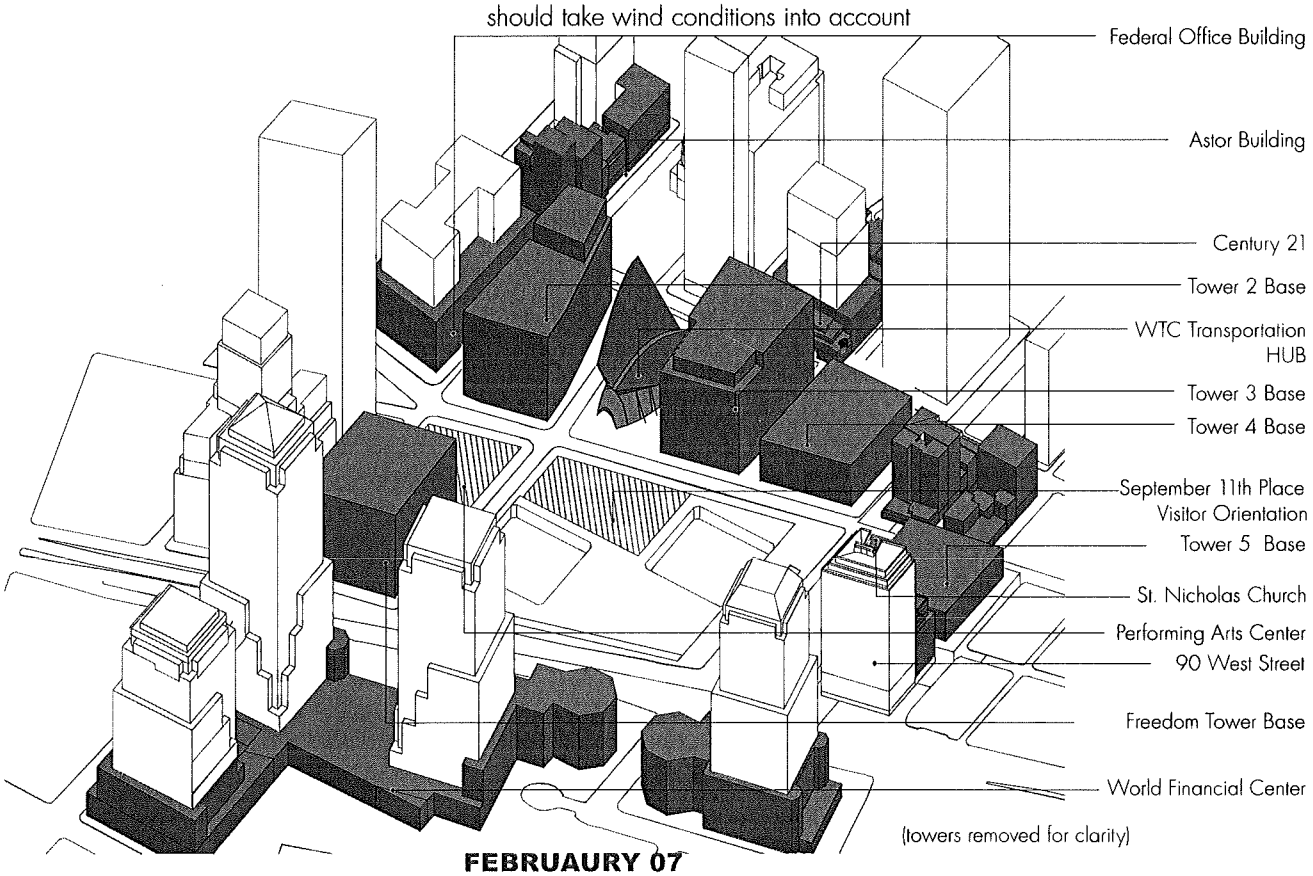
4.4.2 Street-Oriented Form and Use



Development at street level and two to five levels above-grade will have the greatest impact on the pedestrian realm. It will be the public face of the new World Trade Center, and the plan makes every effort to promote continuous lines of activity along streets. Pedestrians are primarily aware of uses on the lower floors. Therefore, it is important to balance the competing demands on street frontage for retail uses, office lobbies, and access to underground spaces. Above-grade retail spaces and office lobbies should be transparent, visible and easily reachable from street level and provide office tenants with an entrance to the building that is safe and secure and represents a Class A experience. Consideration of scale, color, articulation and texture should be at the forefront in the development of the building bases to establish a human-scaled, vibrant pedestrian experience.

The scale of the project at street-level is oriented to the pedestrian and relates to many existing structures surrounding it. The diagram below illustrates these relationships between the project and the adjacent portion of Lower Manhattan's existing fabric.

Typically, ground and 2nd level frontages will consist of office lobbies and retail uses, with the possibility of retail extending above the second floor. Commercial and mechanical spaces will be located above retail. To respect pedestrian scale, the buildings may step back from the base to articulate the street zone and provide adequate light and air. To enhance the pedestrian experience, design should take wind conditions into account



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The five towers on the master plan shall be organized in a three-dimensional spiral culminating in the Freedom Tower. Their orientation will emphasize the centrality of the memorial space.

More significant than a particular massing of any of the towers is the overall composition of the set of five and their relationship to one another.

The heights and proportions of the towers are based on the distribution of program. Towers on the WTC site must be arranged in an ascending spiral, with Tower 1 taller than Tower 2, T2 taller than T3, T3 taller than T4 and T4 taller than T5. As the towers will be built over time and not necessarily in numerical order, the following range establishes elevations to the top of the structure, not including spires, masts and aerials, for each of the towers. Elevator or stair bulkheads, roof water tanks or cooling towers shall be enclosed and shall not be permitted above the maximum elevation as described in these guidelines. Other exposed appurtenances such as chimneys, flues and flagpoles shall not be permitted on the roofs of these buildings. Exposed masts and aerials shall not exceed 10% of the roof area nor shall their height exceed the heights of the masts or aerial on the next highest tower.

Tower 2 — El 1400′ – 1600′
Tower 3 — El. 1300′ – 1500′
Tower 4 — El. 1200′ – 1300′
Tower 5 — Max El. 1200′

*These are elevations measured off of the PANYNJ datum (mean sea level 0 is equivalent to El. 300 in the PANYNJ datum) not absolute tower heights.

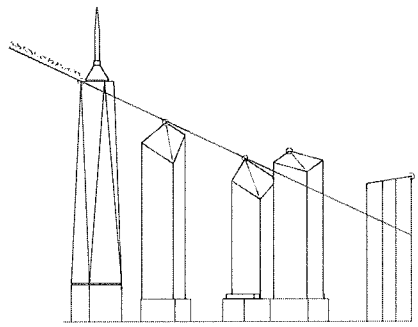
Within this range, there is flexibility as development progresses on the site. Tower architects may propose towers to the Design Guidelines Committee with heights that fall outside the established range if they can show that their tower's proposed height maintains a meaningful height distinction of 100′ from each of the adjacent towers. If one of those towers has not yet been built, the architect should verify to the Design Guidelines Committee that the proposed tower height does not preclude the subsequent towers from reaching their maximum height and viability as set forth in the established range.

Notwithstanding the above tower height criteria, the design guidelines recognize the challenges that these guidelines present for future development given the possible variations and demands of tenant mix, technology of mechanical systems and other tenant program mix and mechanical requirements. In the event these impacts must be mitigated, special architectural solutions will be considered which preserve the master plan's visual objectives but which accommodate reasonable special requirements of first class commercial office development.

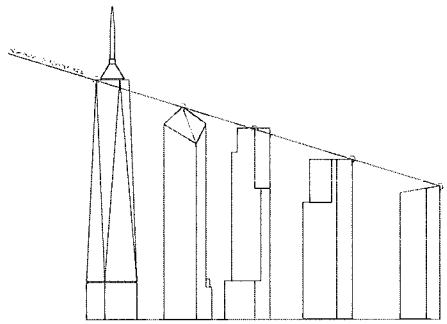
The tower shafts, to the extent required, should set back above the bases and reduce the tower widths at higher elevations to increase the amount of light and air between the towers and increase the comfort of the pedestrian realm. Towers 2, 3 and 4 will each sit atop a podium base, containing a mix of commercial office, retail and mechanical uses. Streetwalls of Towers 2-4 shall be between 100' – 245' in height. This includes up to 4 levels of at and above grade retail as well as double height at-grade office lobbies and normal and appropriate office tower support spaces. The requirement for each tower is outlined in detail in Chapter 5.

Throughout the site, all towers should be designed to get more slender as they rise to provide daylight to surrounding buildings and streets to strengthen the overall composition of buildings on the site.

Additionally, the shaping of each tower and its top should be considered within its relationship to the set of five. Each tower top should be designed to reinforce the spiraling nature of the set of five towers and the centrality of the Memorial at the heart of the site. Each tower top should acknowledge the Memorial in a meaningful and appropriate way. For example, each roof could inflect toward the Memorial and the slopes could decrease beginning with Tower 1's roof as the greatest slope and Tower 5's as the shallowest slope



Unacceptable Solution
Resultant roof heights do not form desired relationship of ascending heights.



Acceptable Solution
Resultant roof heights do form desired relationship of ascending heights.

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Materials 4.4.4

The palette of materials for the towers is meant to provide a balance between the need for overall consistency of the site, and the desire for individuality in each of the building designs.

Buildings on the World Trade Center site should employ technologically advanced envelopes to achieve luminosity and transparency. This will create interiors with generous daylight that take advantage of views to the site and surroundings. It will also give the complex a unified presence, both day and night. Since envelope technology is constantly evolving, buildings on the site should take advantage of the latest proven developments to ensure high energy performance.

The consistency among buildings is achieved by employing a palette of metal, glass and other materials consistent with the goals of luminosity and transparency. Metal finishes may consist of stainless steel natural titanium, or other metals with a permanent coating. The glazing shall be in keeping with the sustainability guidelines outlined in Section 8. The building bases, which are primarily comprised of office lobbies and retail, should have maximum transparency so that they are continuous with streetscape to the greatest extent possible.

Alternate materials may be used to achieve architectural design intentions. Similarly, alternate materials may be used in order to achieve enhanced performance in the buildings and to incorporate new curtainwall and other technologies.

Lighting 4.4.5

Designers of the five towers could employ decorative night lighting of the tower tops to create an individual identity for each of the buildings while maintaining a cohesiveness to the site as a whole. When viewed on the skyline, the towers should be visible as a set of five in both the day and night sky alike (to the extent practicable). Timing, duration and color of the lighting may be varied depending on the season and time of night. Such lighting of the towers should be employed in a manner sensitive to the Memorial and pedestrian experience at-grade.

Because lighting of glass towers at night may be attractive to birds, design and operational measures should be considered and implemented wherever practicable to reduce the number of bird collisions.

4.4.6 Façade Expression

The façade expression of the site's five towers should support the overall composition. While the plan does not intend to prescribe the specific design of façades, it is intended that the guidelines support a cohesive complex of buildings in which variations of reflectivity, pattern, scale, finishes, and other façade treatments are considered and developed in support of the larger urban composition. With this said, the final rhythms, patterns and proportions of the tower façades are left largely to the discretion of the individual designers.

The façade expression of building bases needs to help enliven the streetscape. Visibility from the street into the office lobbies, retail spaces and transit use is essential; the greatest possible extent of at-grade building façades should be transparent.

Projections from the façades at bases are permitted. Canopies and marquees are encouraged to help mitigate the effects of wind and rain at the sidewalk. These elements should be comprised of metal and glass, and should read as part of the overall design of the building and not as appendages. Projections must be at least three feet from the curb, and should be coordinated harmoniously with streetscape elements. Building identification signage and environmental graphics should comply with Section 9, Signage Guidelines.

Light shelves and sun screens may be used on the appropriate façades at any height of the buildings to control sunlight while offering variety and texture. Louvers for air exchange need to be integrated into the overall façade expression, or preferably made invisible. Roof-mounted mechanical and electrical equipment shall be screened from view from street level. Architects should also consider the appearance of such equipment from viewpoints above street level.

Use Plan 4.5.1

The figure below indicates the use plan for the site, distinguishing between building parcels, open space sites and areas reserved for streets and pedestrian ways. Detailed design guidelines are presented in Sections 5 and 6 for each parcel. The plan below is not intended to indicate a construction parcel plan.

Parcels extend to the edges of curbs on public streets; design guidelines indicate the required widths of sidewalks.

The table opposite indicates the approximate development by type of use on each of the development parcels. Figures for each parcel are for above grade spaces. The WTC PATH Terminal, truck service, security screening, tenant parking and mechanical spaces are not included in the accounting.

Parcel / Site Label (X)

Parcel / Site Boundary

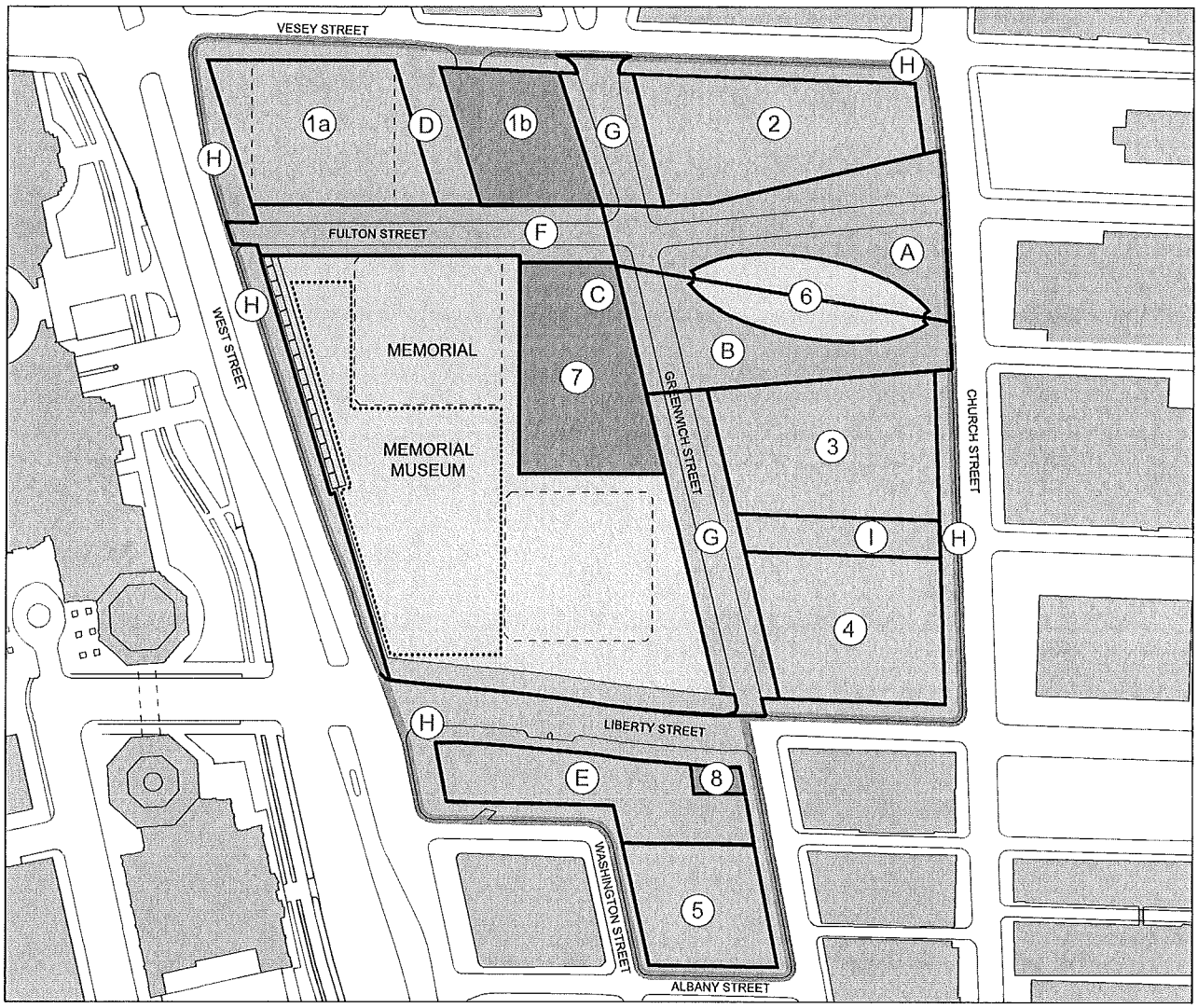
Streets and Public Open Spaces

Memorial

Cultural / Educational / Civic Parcel

Commercial Parcel

Transportation Parcel



COMMERCIAL SPACE	Parcel	Parcel Area	Max. Buildable Podium Area (% of Parcel Area)	Max. Buildable Tower Footprint (SF)	Maximum Area (SF)	Range of Tower Elevations (Min-Max)
Tower 1 (Freedom Tower)	1A	62,000	71%	44,000	2,600,000 see Note A	El. 1776'
Tower 2	2	61,300	90%	42,700	2,300,000 see Note A	El. 1,400' - 1,600'
Tower 3	3	61,400	88%	42,900	2,100,000 see Note A	El. 1,300' - 1,500'
Tower 4	4	54,000	92%	41,700	1,800,000 See Note A	El. 1,200' - 1,300'
Tower 5	5	32,000	100%	32,000	1,300,000	Max. El. 1,200'
Total Areas					**10,100,000**	
					MAXIMUM TOTAL AREA	

Note A: Towers 1, 2, 3 and 4 square foot quantities are above grade office floor area, excluding Lobby, Mechanical Space, Retail, Restaurant uses and Broadcast Facilities.

OPEN SPACE	Site	Approximate Site Area (SF)
Wedge of Light Plaza (including Fulton Street East of Greenwich)	A	52,850
HUB Plaza	B	42,850
September 11th Place	C	31,750
Washington Place	D	12,900
Liberty Park	E	53,000
Fulton Street (West of Greenwich)	F	40,000
Greenwich Street	G	62,450
Typical Streetscape	H	105,520
Cortlandt	I	13,400
Total Areas		**414,720**

CULTURAL	Parcel	Approximate Site Area (SF)
Performing Arts Center	1B	32,200
Visitor Orientation & Education Center	7	14,800
Total Areas		**47,000**
		TOTAL SITE AREA

HOTEL + CONFERENCE FACILITY	Parcel	Approximate Total Area (SF)
Hotel + Conference Facility	TBD	up to 750,000
Total Areas		**750,000**
		TOTAL SITE AREA

Note: Exact dimensions to be determined based on completion of final survey per the diagram in section 4.5.1.

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Vertical Organization of Uses 4.5.2

Mechanical

Commercial Office

Public and Transit

Commercial Retail

Tower 1 (A)

Tower 2 (B)

Tower 3 (C)

Tower 4 (D)

Tower 5 (E)

WTC Transportation HUB (F)

September 11th Place Visitor Orientation & Education Parcel (G)

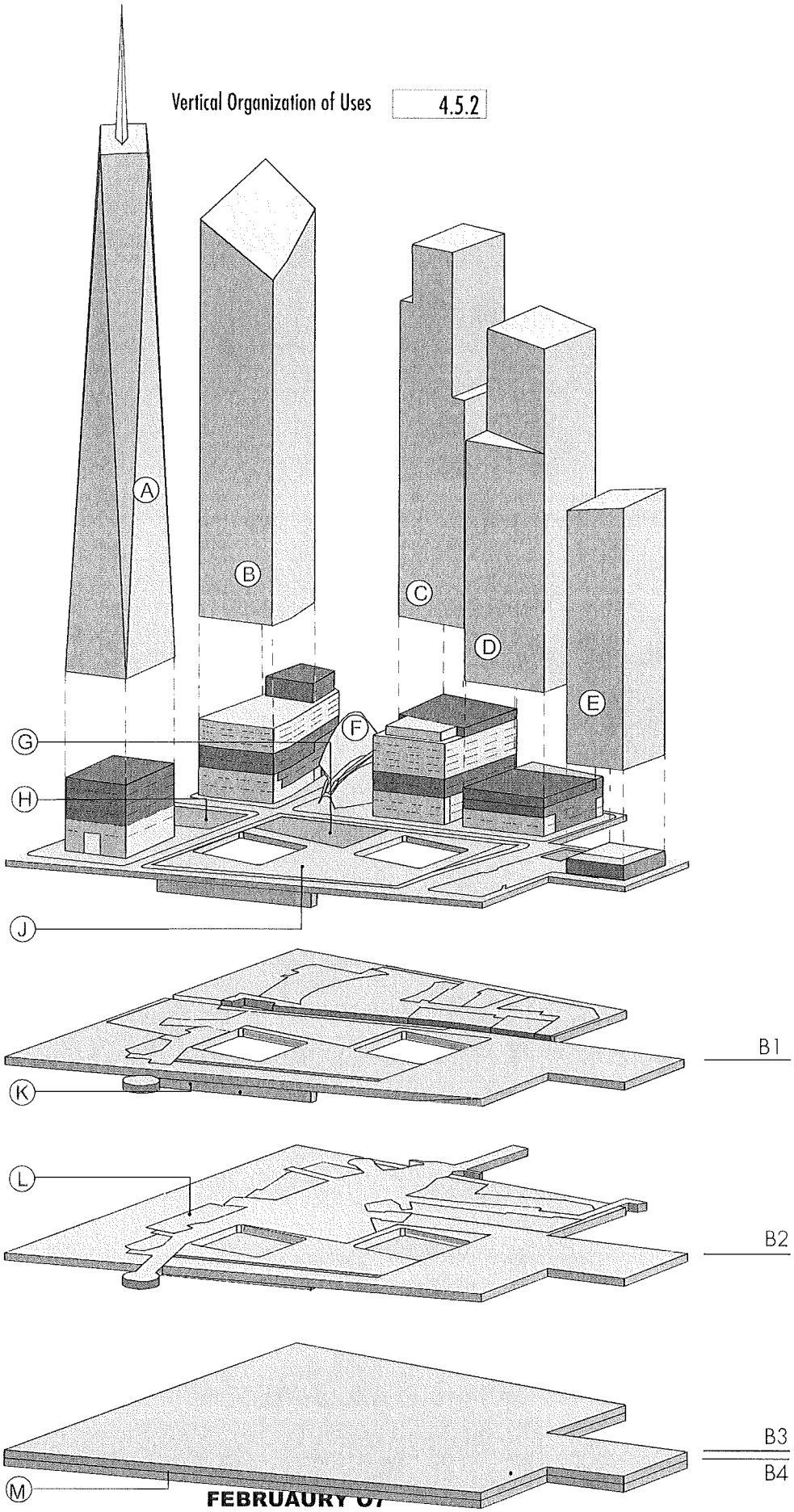
Performing Arts Center (H)

The Memorial (J)

Slurry Wall (K)

B3: Truck Loading + Utility (L)

B4: Car Parking + Utility (M)



Note regarding axonometric diagrams and parcel plans: The distribution of at-grade space between office lobby, retail and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.

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4.6 Cultural Uses

Cultural and civic uses will occur on parcels 1B, 7 and 8. These facilities will be catalysts for cultural uses on Fulton Street and throughout Lower Manhattan.

The Performing Arts Center on parcel 1B will add a cultural dimension to the World Trade Center site that has been missing in Lower Manhattan. Urbanistically, it will help define the cultural crossroads of the site, at the intersection of Fulton and Greenwich Streets. The program for the Performing Arts Center may include the Joyce International Dance Center and the Signature Theatre Company in a combination of theatres of various sizes. The new center should be designed with active uses on the street level (including retail), and with highly visible uses above to add interest and excitement to the street. Parking, service and commercial office support program are permitted below grade. Design intentions and guidelines for Parcel 1B are described in detail in Section 5.2.

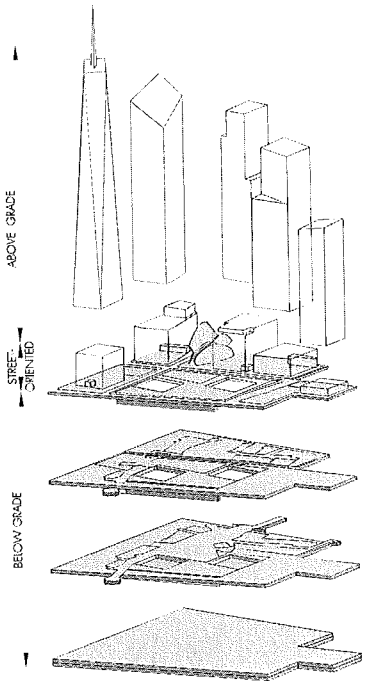
The program for the Visitor Orientation & Education Center will include WTC site orientation, educational information, and public program spaces as well as ticketing facilities and other visitor services and amenities for the Memorial and Memorial Museum. These uses will help activate the site beyond weekday work hours and are essential to the Greenwich-Fulton civic crossroads. Design intentions and guidelines for this parcel are described in detail in Section 5.8.

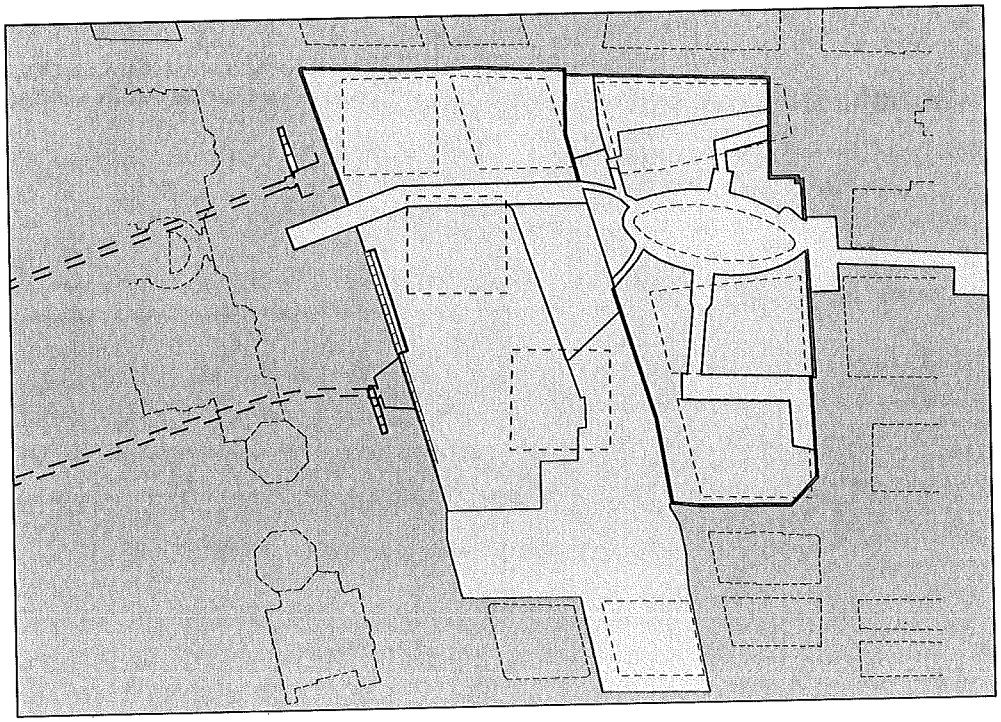
Parcel 8 is reserved for the rebuilding of St. Nicholas Greek Orthodox Church, which was destroyed by the collapse of the South Tower, and for other cultural uses. Located in Liberty Park, across Liberty Street from the Memorial quadrant, it is sufficiently removed from the World Trade Center site to maintain its own separate identity. Design intentions and guidelines for the Church parcel are described in detail in Section 5.9.

Transportation uses occur on and below Parcel 6 in the form of the new permanent WTC Transportation HUB planned for the site. The great terminal will include a new Transit Hall that will be the highly visible symbol of a new World Trade Center. The Wedge of Light Plaza, adjacent to the Transit Hall, constitutes the major public plaza of the new complex.

The WTC Transportation HUB will be an important node in the system of underground concourses, uniting multiple transit uses by allowing direct pedestrian connections from the PATH system to fourteen subway lines. The underground network will be rimmed with retail uses and will provide pedestrians with a seamless connection from the World Financial Center in Battery Park City to the Fulton Transit Center on Broadway. From the underground concourse, pedestrians will also be able to make direct connections to the commercial office space as well as to streets running throughout the site.

Refer to the WTC Transportation HUB Design Guidelines for further information on public transportation, below-grade concourses, associated retail and the PATH Transit Hall.

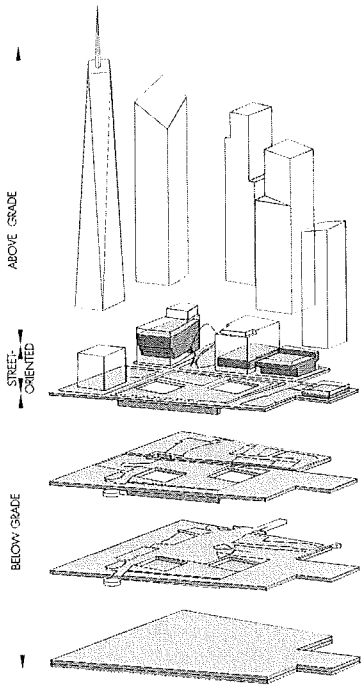




PATH Concourse
Retail
Service
Memorial Site

B2 - Lower Concourse Level

4.8 Commercial Retail Uses



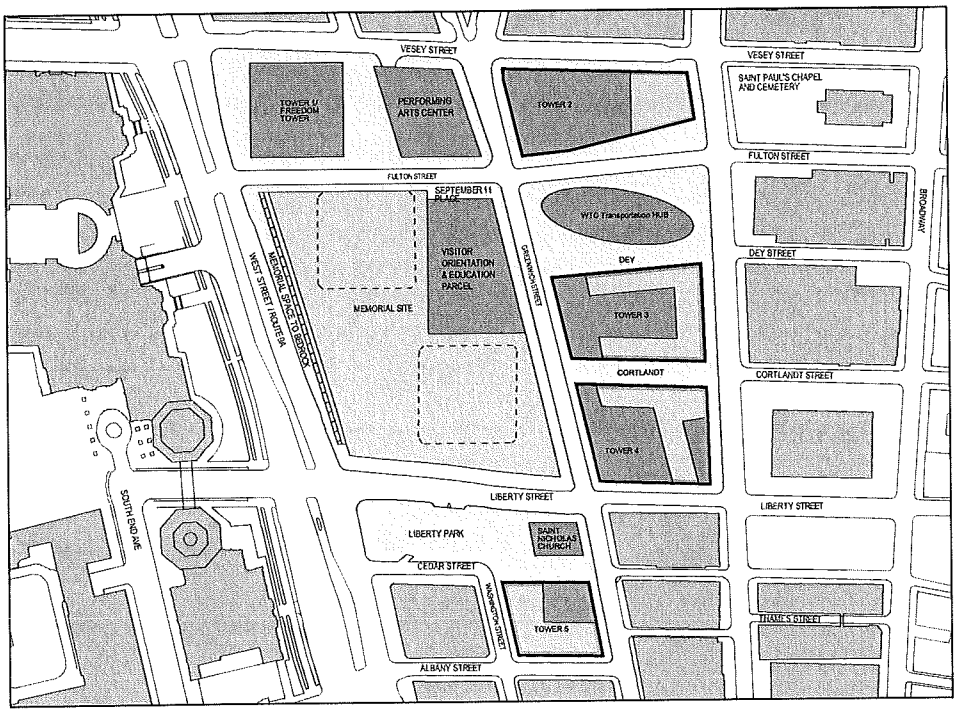
The World Trade Center site must be a premier retail district, serving office workers, residents, and commuters alike, as it was prior to September 11th. In an effort to ensure a lively pedestrian experience on the street, retail uses will be found at-grade throughout the site.

In addition to at-grade commercial retail uses, retail spaces would occur on multiple levels of the site: two below grade and up to four levels above grade depending on the parcel. This provides multiple retail opportunities for shoppers on the most populated levels with the best connections to the street. In addition, this creates the opportunity for a wide range of vertically-joined spaces to accommodate various retail configurations. The site provides approximately 600,000 gross square feet of retail with approximately half at or above grade.

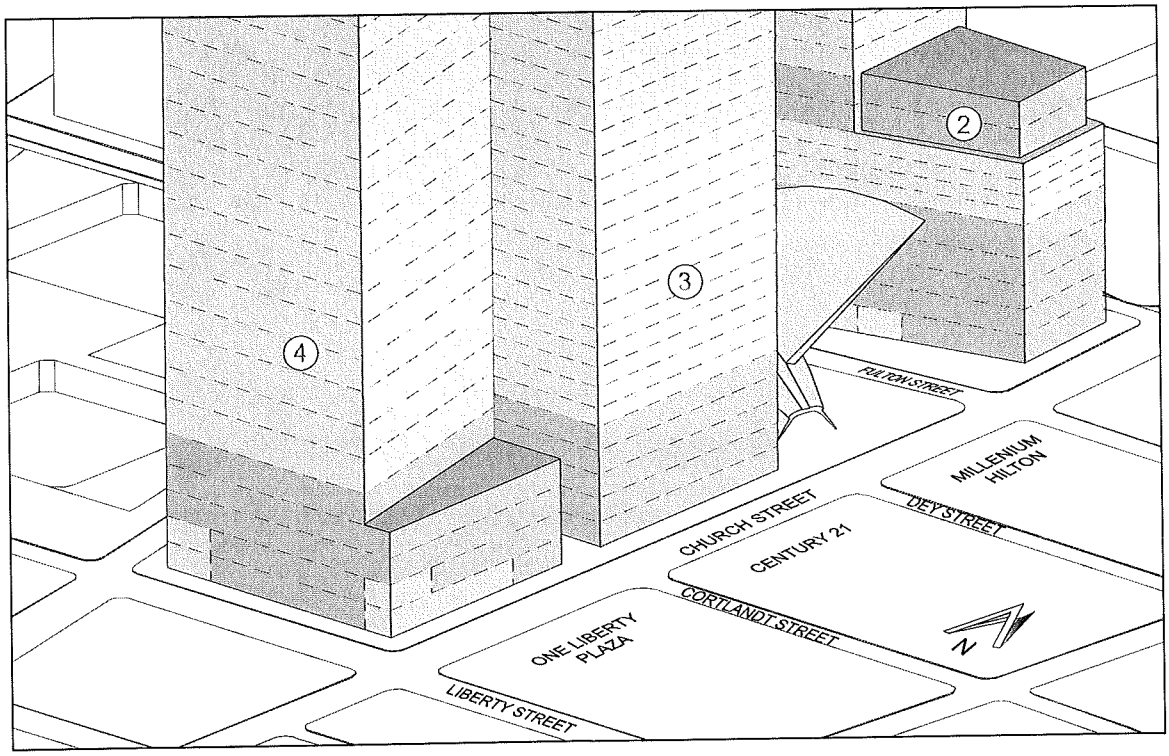
The below-grade retail uses will form an integral part of the underground transportation concourses, serving pedestrians as they move throughout the network to a variety of uses including the office buildings, observation deck in Tower 1, the Memorial, the cultural buildings, etc.

Refer to Section 7 for additional information on Commercial Retail guidelines.

Commercial Retail



At-Grade Retail Plan

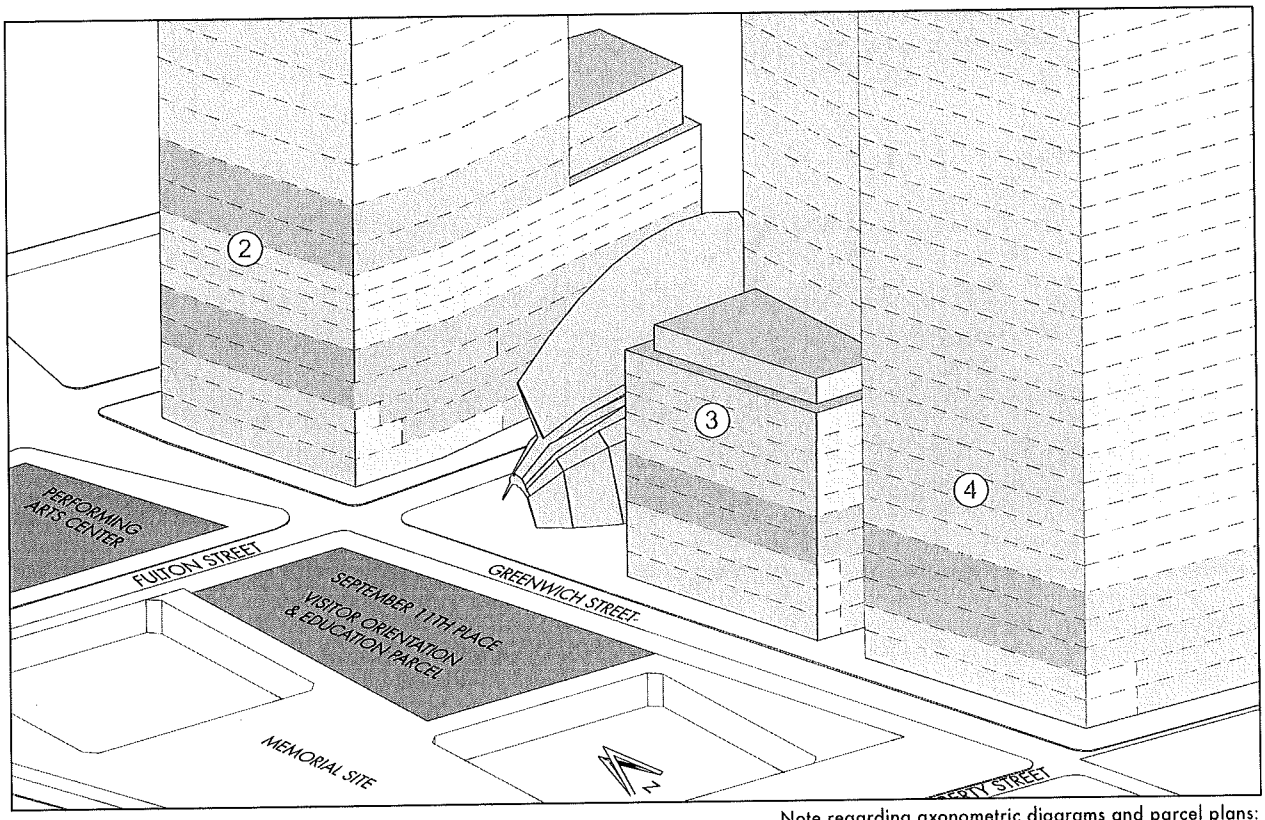


Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.

Church Street

Church Street, a major north-south street, is a bustling thoroughfare with commuters coming from the PATH trains, subways and buses to offices in the financial district and surrounding neighborhoods. With the existing commercial office, retail, hotel and institutional uses immediately adjacent to the site, Church Street will be an active two-sided street providing an excellent opportunity for street-level retail.

- Commercial Office
- Commercial Retail
- Public Transit
- Cultural Use
- Mechanical



Note regarding axonometric diagrams and parcel plans:
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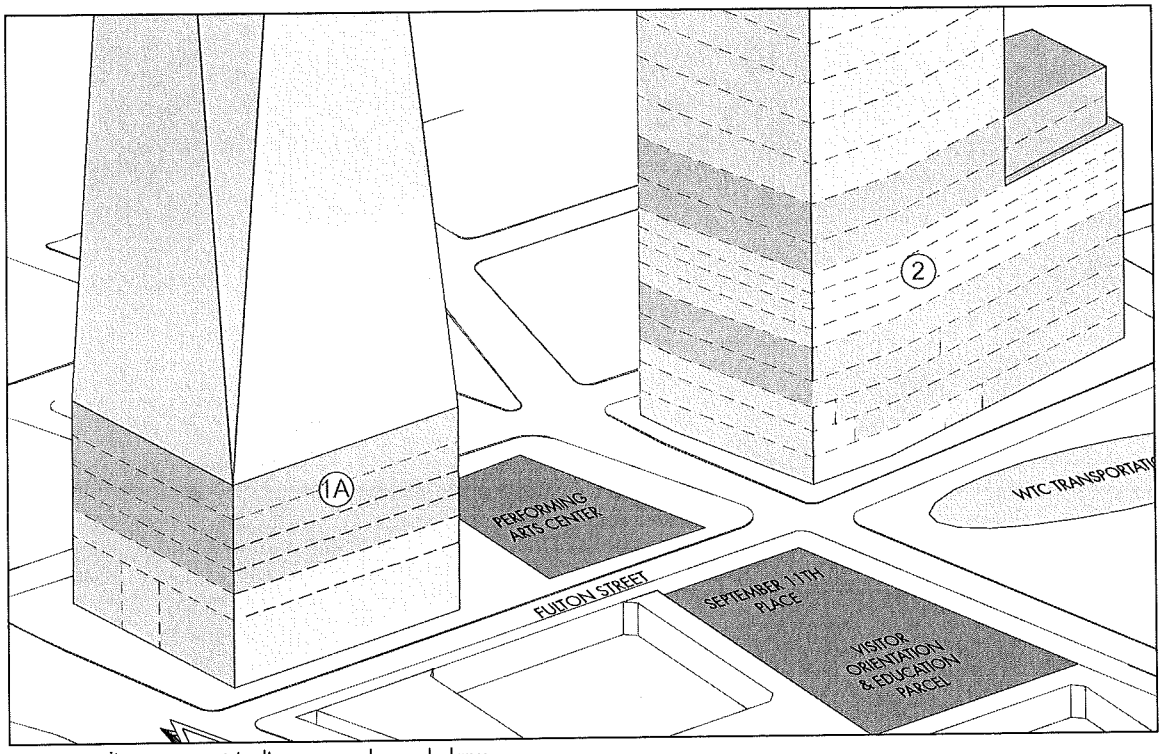
Commercial Office
Commercial Retail
Public Transit
Cultural/Educational Use
Mechanical

Greenwich Street

Greenwich Street will provide key north-south access through the World Trade Center site; it will serve to connect the site with the flourishing residential district of Tribeca to the north and the burgeoning area to the south. Many of the pedestrians on Greenwich Street will be visitors to the Memorial and cultural facilities. Pedestrians may be funneled to Greenwich Street from a number of public spaces. September 11th Place, located at the corner of Greenwich and Fulton Streets, will provide a key entrance to the memorial precinct and serve as a major downtown crossroads.



Note regarding axonometric diagrams and parcel plans:
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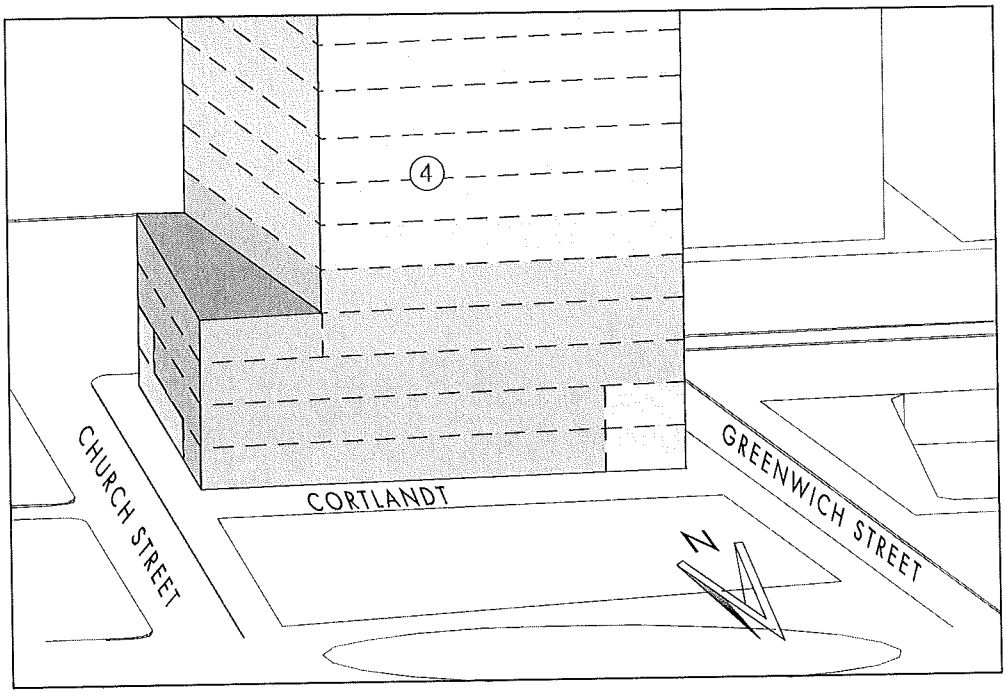
Commercial Office
Commercial Retail
Public Transit
Cultural Use
Mechanical

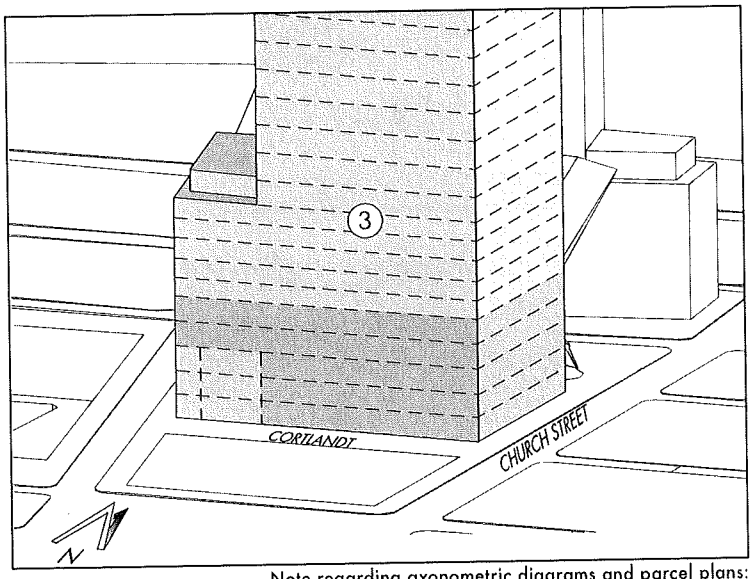
Fulton Street

Fulton Street will be a major east-west connection, running from river to river. With the World Financial Center Winter Garden in the west and South Street Seaport in the east, Fulton Street will provide pedestrians with a thriving retail experience. In addition to active retail uses, pedestrians walking along Fulton Street will pass the major open spaces found on the World Trade Center site, including the Wedge of Light Plaza, September 11th Place and the Memorial. Fulton Street will also serve as a focal point for transportation uses with the new Fulton Transit Center on Broadway, connecting multiple subway lines in a grand hall.

Dey

Running east-west, Dey will be a major open, pedestrian connection located between the WTC Transportation Hub and Tower 3 to reconnect the World Trade Center site with the existing streets of Lower Manhattan. Running between Greenwich Street and Church Street, Dey will be a major link to the WTC Transportation Hub and an important east-west connection to and from the Memorial, September 11th Place and the center of the site. Dey will be incorporated into and be designed as part of the adjacent WTC Hub Plaza but must allow for emergency vehicle access as approved by CDOT and the FDNY.





Commercial Office
Commercial Retail
Public Transit
Cultural Use
Mechanical

Note regarding axonometric diagrams and parcel plans: The distribution of at-grade space between office lobby, retail and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.

Cortlandt

Cortlandt shall be an open, pedestrian connection running east-west between towers 3 and 4 that will be a minimum of 47' wide parcel to parcel. The height and proximity of the streetwall height and adjacent building massing will mean that special consideration should be given to ensuring the quality of the pedestrian experience. There shall be no bridges, elevated platforms or other galleria or roof structures between the towers. Cortlandt shall be constructed to standards that meet CDOT requirements including the ability for the roadway to carry emergency vehicles.

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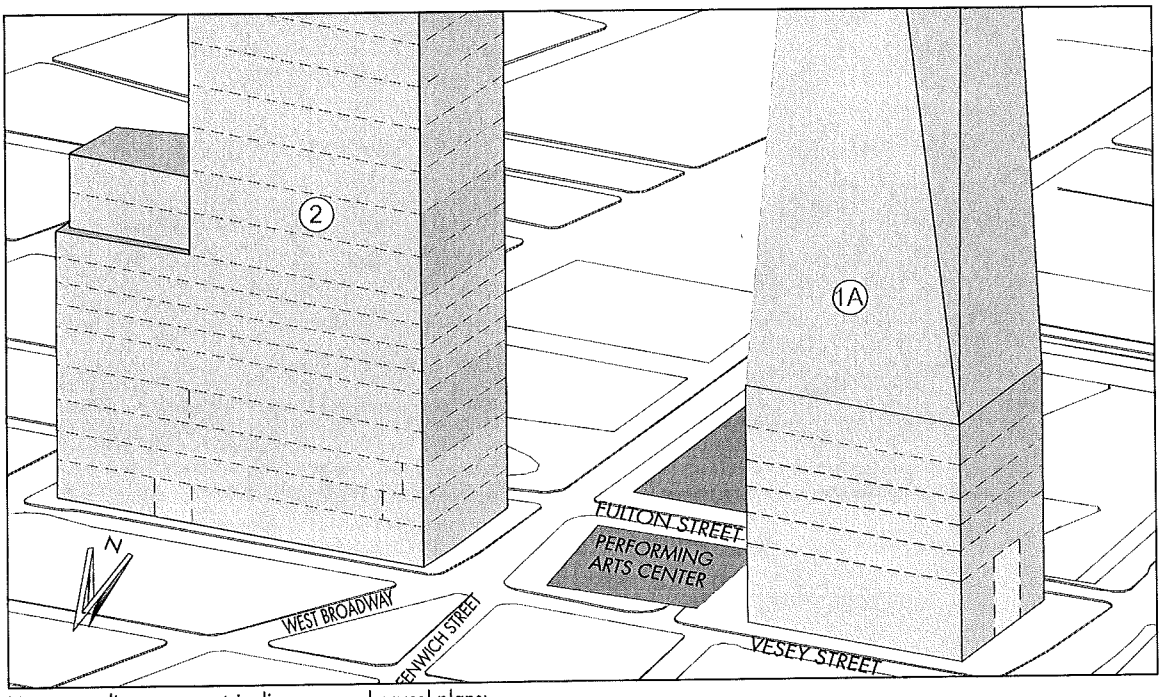
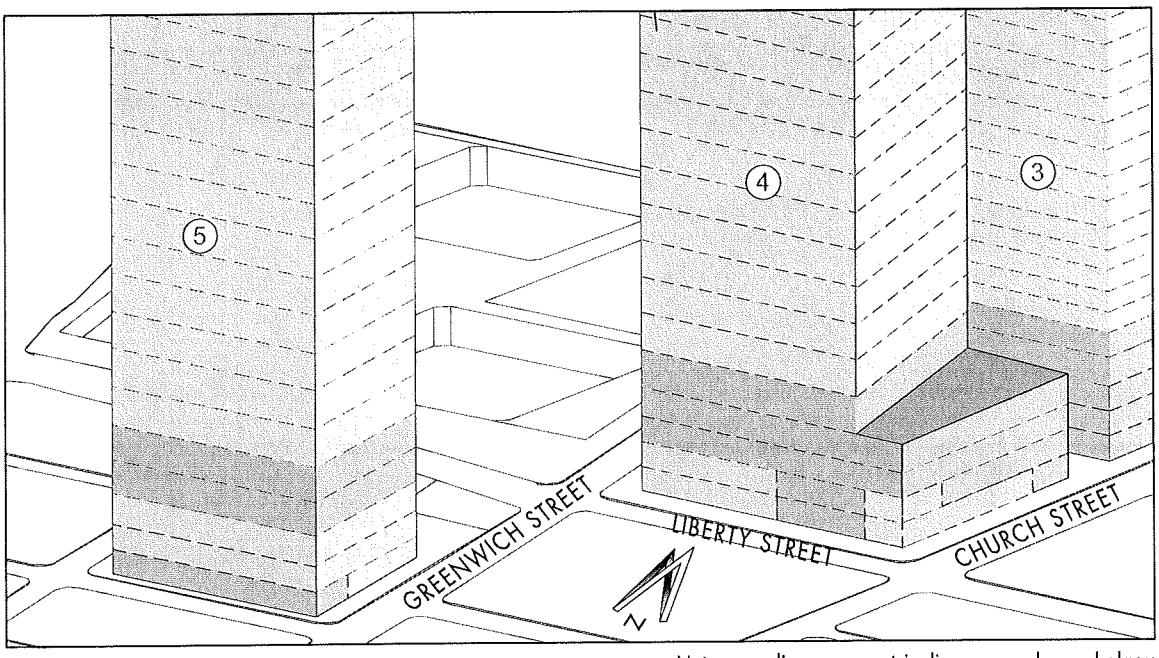


Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail and public transportation programs remains to be determined.
These diagrams are illustrative of street frontages and approximate locations.

Vesey Street

Running east-west, Vesey Street will serve as the northern entrance to the site as well as provide access to lobbies for the Freedom Tower and Tower 2. Entry to parking for Tower 1 will be accessed off of Vesey Street. Vesey Steet will also help to form a connection of public spaces from the triangular 7 World Trade Center park at Greenwich and West Broadway to the larger open spaces of the World Trade Center site.

- Commercial Office
- Commercial Retail
- Public Transit
- Mechanical



Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail and public transportation programs remains to be determined.
These diagrams are illustrative of street frontages and approximate locations.

Commercial Office
Commercial Retail
Public Transit
Cultural Use
Mechanical

Liberty Street

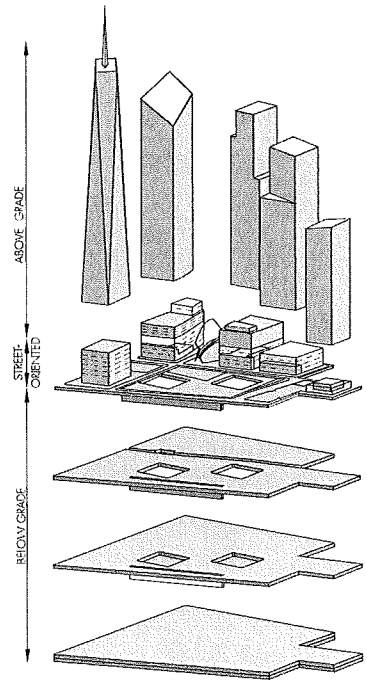
Liberty Street creates a corridor of open spaces extending from east to west, with Liberty Plaza to the east and Liberty Park to the west. Pedestrians coming from the financial district and other districts south and east of the site will use Liberty Street as access to the Memorial district and the World Financial Center. Liberty Street will have street-level retail and an office lobby on the southern edge of Tower 4, as well as retail and an office lobby fronting Liberty Park in Tower 5.

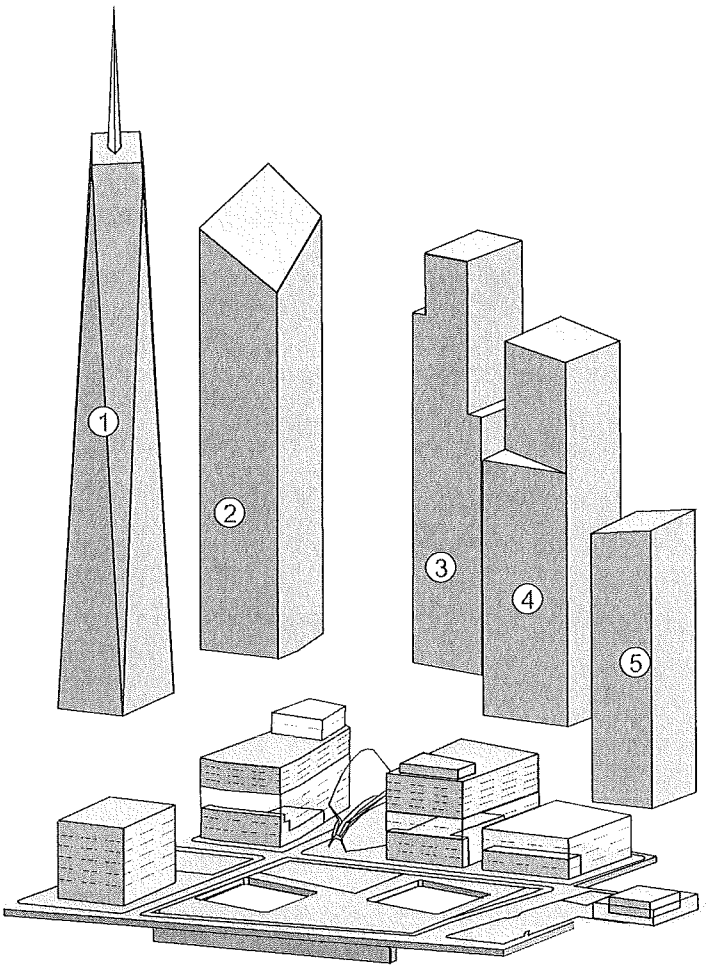
In keeping with the spirit of the original World Trade Center, the site will be a premier commercial office district, with class A office space built in phases.

Commercial office space is organized on parcels 1A, 2, 3, 4 and 5.

Office entries for the Towers will be in the following locations:
Tower 1: Vesey St., Fulton St., Washington Place
Tower 2: Greenwich St., Vesey St., Fulton Street
Tower 3: Greenwich St., and Dey
Tower 4: Greenwich St. Liberty St. and Cortlandt
Tower 5: Greenwich St. and the northern edge of the building

Designers of structures should carefully consider the location of emergency exits and service entries so that openings do not conflict with retail and transportation frontages.





Commercial Office

1 Tower 1

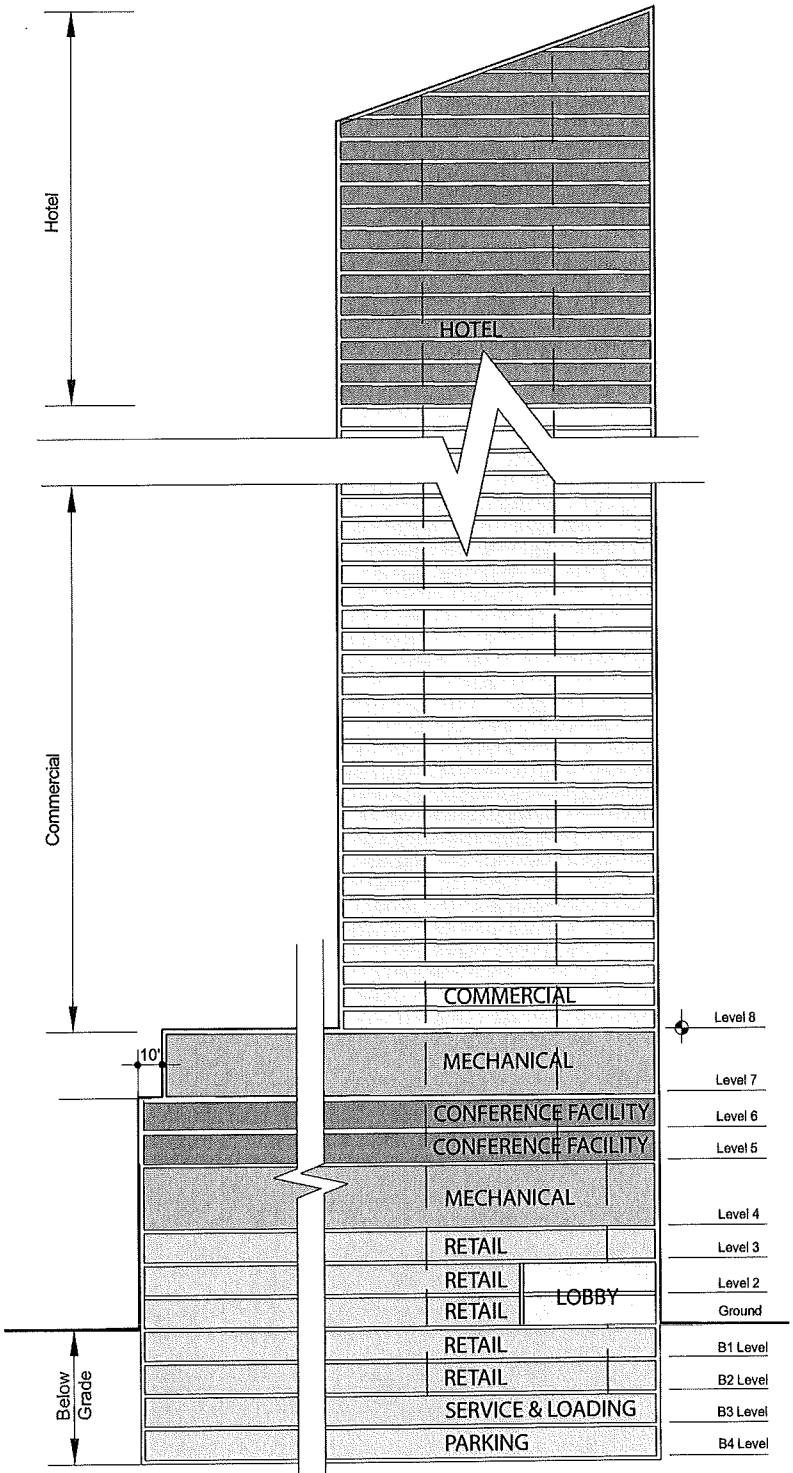
2 Tower 2

3 Tower 3

4 Tower 4

5 Tower 5

4.10 Commercial Hotel/Retail/Mixed Uses



This diragram is illustrative only and is an example of a potential distribution of uses in a tower.

The former World Trade Center Hotel (3 WTC) leased by Host Marriott was a successful and integral part of the WTC site prior to 9/11 and was located between 1 WTC and 2 WTC. The Port Authority, City of New York, and the Alliance for Downtown New York have all cited the importance and desire to restore hotel use. The hotel would serve the needs of both the business travelers using the first-class WTC office facilities as well as the significant tourist population expected as a result of the significant public facilities such as the Memorial, Memorial Museum, Visitor Orientation and Education Center and Performing Arts Center. Further, a hotel would serve the goals of maintaining the vital mixed-use nature of the World Trade Center site.

The WTC Memorial and Redevelopment Plan Environmental Impact Statement and the General Project Plan for the WTC provide for hospitality use for up to 800 rooms with convention center use of up to 150,000 square feet. Because of the need to balance the mixed uses on the site and in order to provide flexibility in how the hospitality use is included, it may be necessary to have smaller facilities rather than one large 800-room hotel. The location and conceptual design of any hotel is still being studied and will be determined by the parties at a later date.

It is possible to mix the hotel and commercial office use in one of the towers on the site

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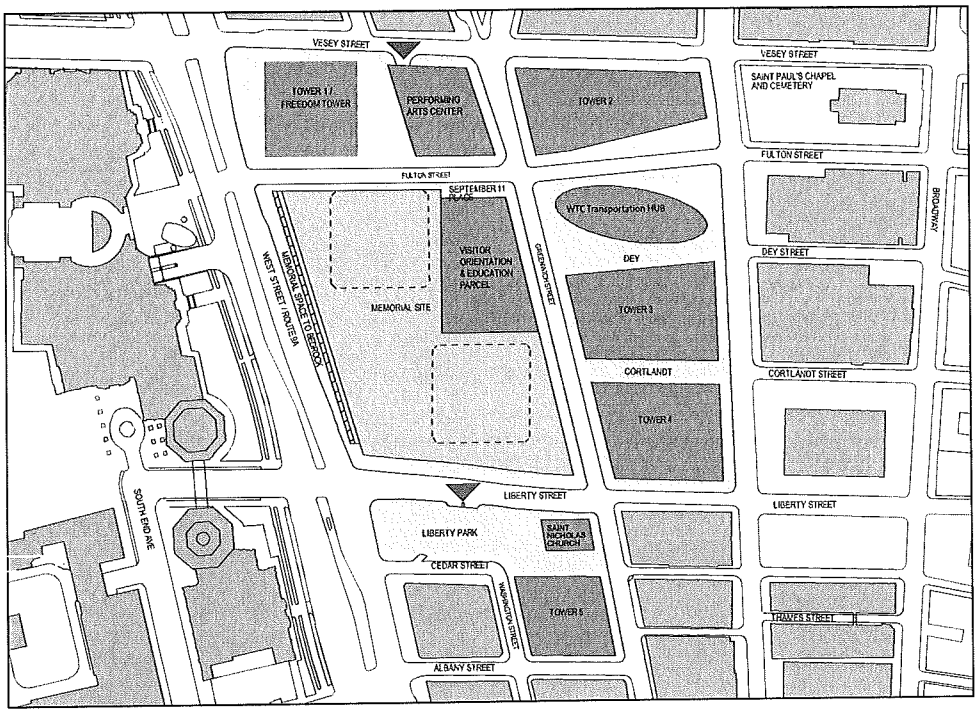
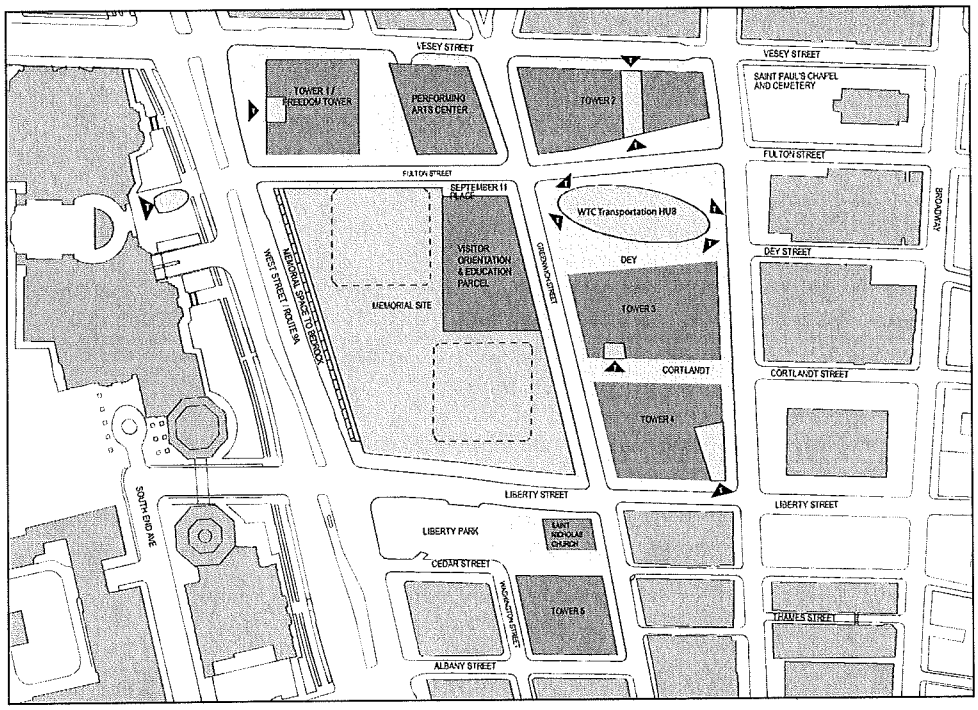
Access to Underground Service and Parking 4.11



Access to Underground Services

The majority of service vehicles and automobiles coming to the site will be directed to the below grade loading and parking areas. The Liberty Street ramp is a two-way entrance and exit for all trucks accessing underground loading facilities. Cars and buses will also enter and exit using the Liberty Street ramp. Below-grade access for automobiles for the Freedom Tower will be separated from the remainder of the site's below-grade service network and may use separate entrances on Vesey Street. Tour bus parking will be provided below-grade.

4.12 Access to Concourses and Transit



Access to Underground Retail and Public Transportation *(locations have not been finalized)*

Public and Transit

Most of the users of the new World Trade Center site (and of the financial district and Battery Park City) will take advantage of its direct connections to the public transit system. Underground concourses will direct people to the PATH system and subways while offering retail opportunities to commuters and others. Vertical access points to the underground concourses will become highly active pedestrian nodes at street level. These grade-level access points are distributed in highly visible areas of the site, integrated with buildings and situated near street corners. The WTC PATH Terminal is the central crossroads of the underground concourse system and an important civic building in its own right providing a generous sense of arrival in Lower Manhattan. Other access points occur at street level in Towers 1-4. Tower 1 transportation entry is to be located at the building base at grade along the western edge. The underground concourses also reach outward from the site to the WFC Winter Garden across West Street, and possibly to Liberty Plaza at the southeast corner of Church and Liberty Streets.

Continuing the New York City tradition, there are also independent access points to the subway system. Access stairs for the 1 subway line are located within the sidewalks along Greenwich Street, and access stairs for the W/R subway lines are located along Church Street. If these stairs are located within the sidewalks, they should be at the curb. These stairs should be carefully located to avoid conflict with major entrances to buildings and public spaces.

Below Grade Service, Loading, Parking and Storage 4.13

Distribution of Uses 4.13.1

The World Trade Center site has been designed to utilize below-grade space to accommodate servicing, reducing the demands on city streets and returning sidewalks to pedestrians. A roadway system connecting truck loading and bus parking areas, utility systems, elevator cores and parking areas will be located below ground. In addition, large areas have been reserved for the mechanical and electrical infrastructure required for a site of this size and complexity. Two entries are planned to service the below ground areas: one descends from Liberty, and a second from Vesey Street. Each entry has been designed with sufficient queuing space to minimize congestion on streets, and is located strategically to minimize impacts on traffic flows. No loading docks are permitted at street-level.

Servicing Requirements 4.13.2

Loading docks for truck delivery have been located adjacent to tower cores and each is sized to accommodate the projected needs of the leaseable area they serve–office towers, retail space and cultural uses. Each loading dock will accommodate a range of truck sizes for deliveries, as well as trash and recycling operations. Service elevators should be incorporated in each tower for all office and retail deliveries. Independent cores for retail, PATH, cultural uses and hotel uses may need to be provided.

Tenant Parking Requirements 4.13.3

Car parking will be reserved for office tenants. Vehicular circulation should be designed so as to minimize congestion and conflicts between automobiles, trucks and buses.

Storage 4.13.4

Storage will be provided below-grade.

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PARCEL DEVELOPMENT GUIDELINES 5

Section 5 expands on the previous section by looking at each individual parcel in detail. Specific information is given for all commercial parcels, including parcel location and geometry, use and access, and building massing. General information is included for transit and cultural parcels. Site development guidelines for public open space sites are detailed in Section 6.

Parcel 1A (Tower 1/Freedom Tower) 5.1
Parcel Location and Geometry 5.1.1
Use and Access 5.1.2
Building Massing 5.1.3

Parcel 1B (Performing Arts Center) 5.2
Parcel Location and Geometry 5.2.1
Use and Access 5.2.2

Parcel 2 (Tower 2) 5.3
Parcel Location and Geometry 5.3.1
Use and Access 5.3.2
Building Massing 5.3.3

Parcel 3 (Tower 3) 5.4
Parcel Location and Geometry 5.4.1
Use and Access 5.4.2
Building Massing 5.4.3

Parcel 4 (Tower 4) 5.5
Parcel Location and Geometry 5.5.1
Use and Access 5.5.2
Building Massing 5.5.3

Parcel 5 (Tower 5) 5.6
Parcel Location and Geometry 5.6.1
Use and Access 5.6.2
Building Massing 5.6.3

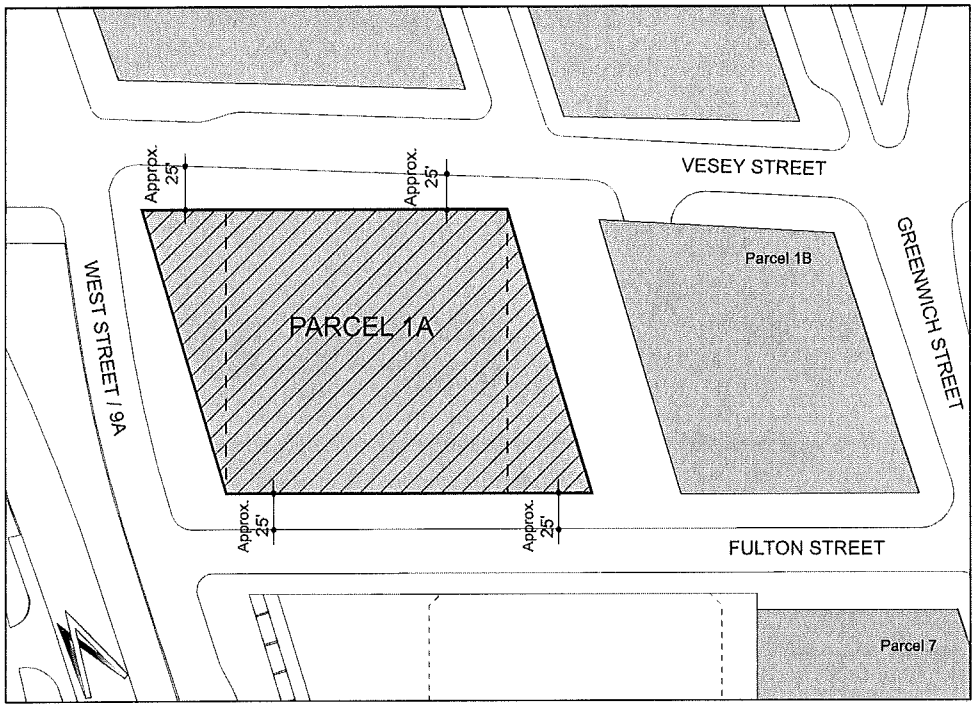
Parcel 6 (PATH Transit Hall) 5.7

Parcel 7 (Visitor Orientation and Education Center) 5.8

Parcel 8 (St. Nicholas Church and Other Uses) 5.9

5.1 Parcel 1A

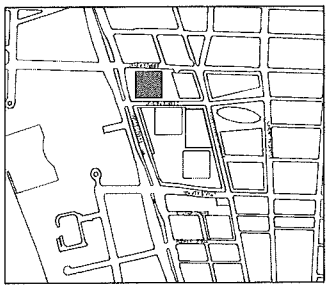
5.1.1 Parcel Location and Geometry



Tower 1 Footprint

Parcel Boundary Line

Buildable Tower Area



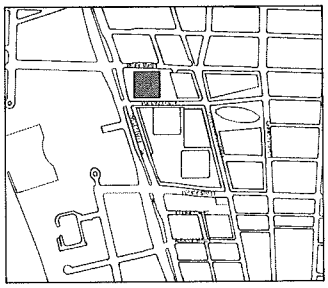
Parcel 1A is a commercial development parcel located at the northwest corner of the site, bounded by West Fulton and Vesey Streets. It is the site of the proposed Freedom Tower (Tower 1), and its geometry is determined by alignments of existing streets and sidewalks, and the public space parcels it borders.

The northern edge of Parcel 1A is delineated by Vesey Street which plays an important role in connecting Battery Park City to the World Trade Center site and the rest of Lower Manhattan. The northern parcel line provides for on approximately 25' sidewalk width.

The location of the West Street curb adjacent to Parcel 1A will be determined by the roadway alignment of the number of lanes at grade to provide a minimum of 25' for pedestrian circulation.

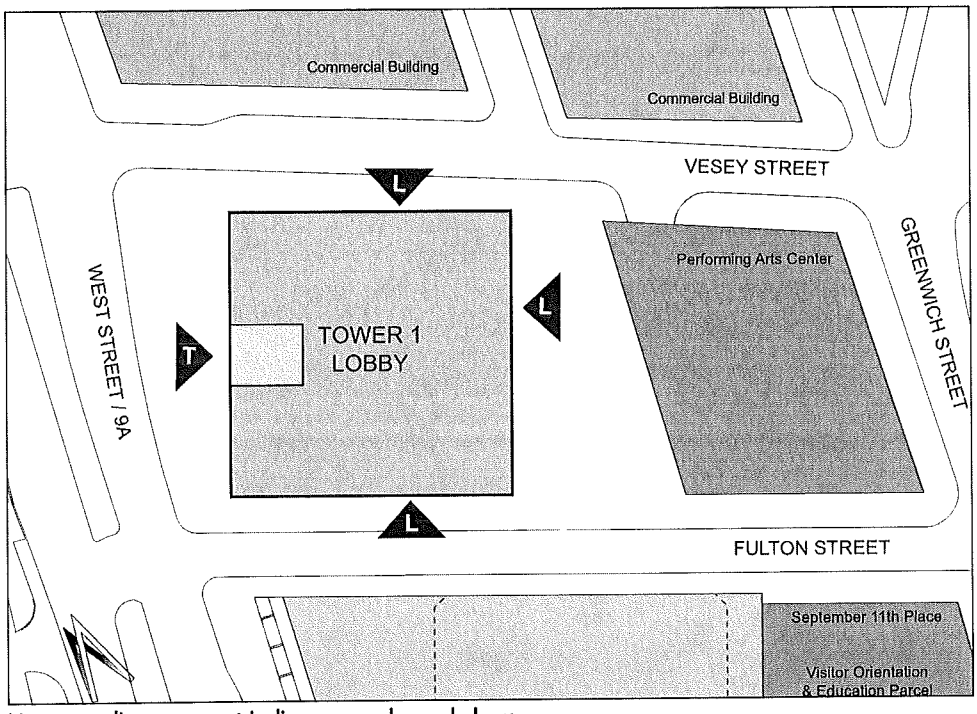
There shall be a 60' separation at-grade between the Performing Arts Center and Tower 1, creating Washington Place. The eastern edge of Parcel 1A faces Washington Place.

The southern build to line allows for an approximately 25' sidewalk along Fulton Street, recognizing the heavy flows of pedestrians along the street.



The Freedom Tower (Tower 1) is envisioned as the culmination of the spiral composition of towers on the site. Tower 1 will contain approximately 70 levels of Class A office space. To enhance the experience for visitors to the World Trade Center site, Tower 1 will also accommodate visitor programs in its upper levels that include an observation deck and one or more restaurants. Inclusion of these visitor spaces in the Freedom Tower will create a historical connection with the Twin Towers. The Freedom Tower's top may also accommodate media transmission antennae and equipment.

In addition to the spaces in its upper levels, the Freedom Tower should be designed for retail and visitor use below grade. Some of these spaces may relate to the elevator lobbies for observation deck visitors, while others will capitalize on the large number of employees and business visitors using the public transportation concourse network and arriving at the Freedom Tower each day. Parking, storage and access to transit may be provided below-grade. The Podium program may include office lobby, public concourse, trading floors, office amenities, mechanical and retail spaces.



Access to Transit and Retail Concourses

Access to Office Lobby

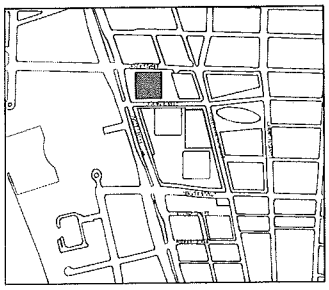
Commercial Office

Commercial Retail

Public Transit

Cultural/Educational Use

Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail, and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.



The main office lobby of Tower 1 shall be accessible from Vesey and Fulton Streets and its eastern edge. The lobby should be grand in scale with a presence befitting the tallest tower on the site. It is important that ground level access for the Freedom Tower recognize that he building is an integral part of the World Trade Center site. Maintaining visible and adequate access to the other public and lobby functions, retail uses on the site, and public transportation courses must be a priority.

In addition to those who use the building on a daily basis, a significant number of visitors will come to Tower 1 to take advantage of the visitor spaces found in its upper levels. To accommodate these users, a separate at-grade entry/lobby will be included. Below-grade connections to the lobby and public uses are also desirable. The lobby shall also have an interior connection to the concourse level.

Below-grade access for automobiles to the Freedom Tower will be separated from the remainder of the site's below-grade service network and may use separate entrances an Vesey Street.

A separate entrance may be located at or below grade for office building services (messengers, etc.).

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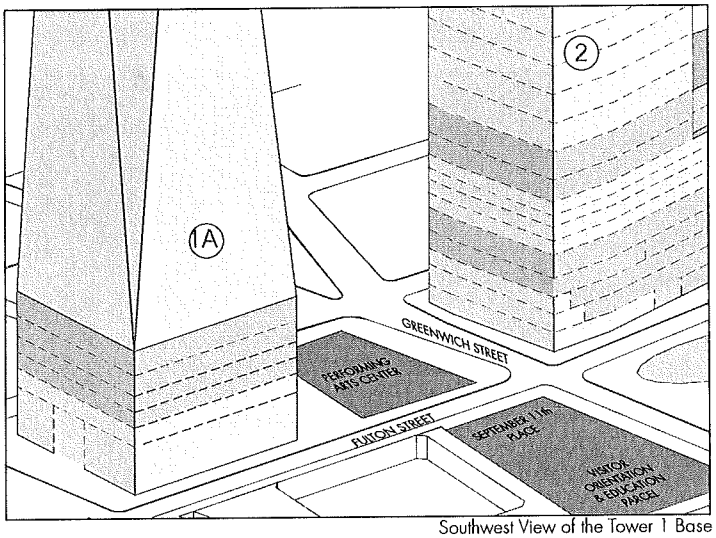
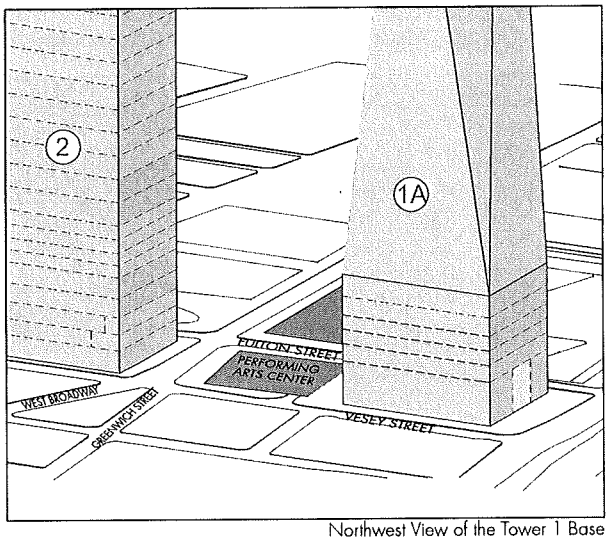
The two diagrams below illustrate the form of Tower 1's base, the locations of its functions and the adjacent building forms and uses.



Southwest View of the Tower 1 Base



Northwest View of the Tower 1 Base

Commercial Office

Commercial Retail

Public Transit

Cultural/Educational Use

Mechanical

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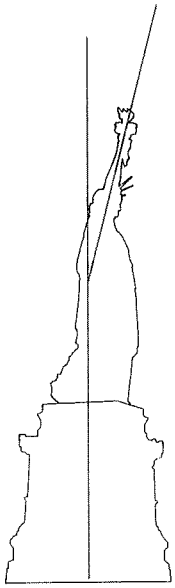
5.1.3. Building Massing



The Freedom Tower should have a distinctive presence amongst related buildings on the site. Its massing is determined, in part, by the following points:

The building marks the symbolic height of 1776 ft.

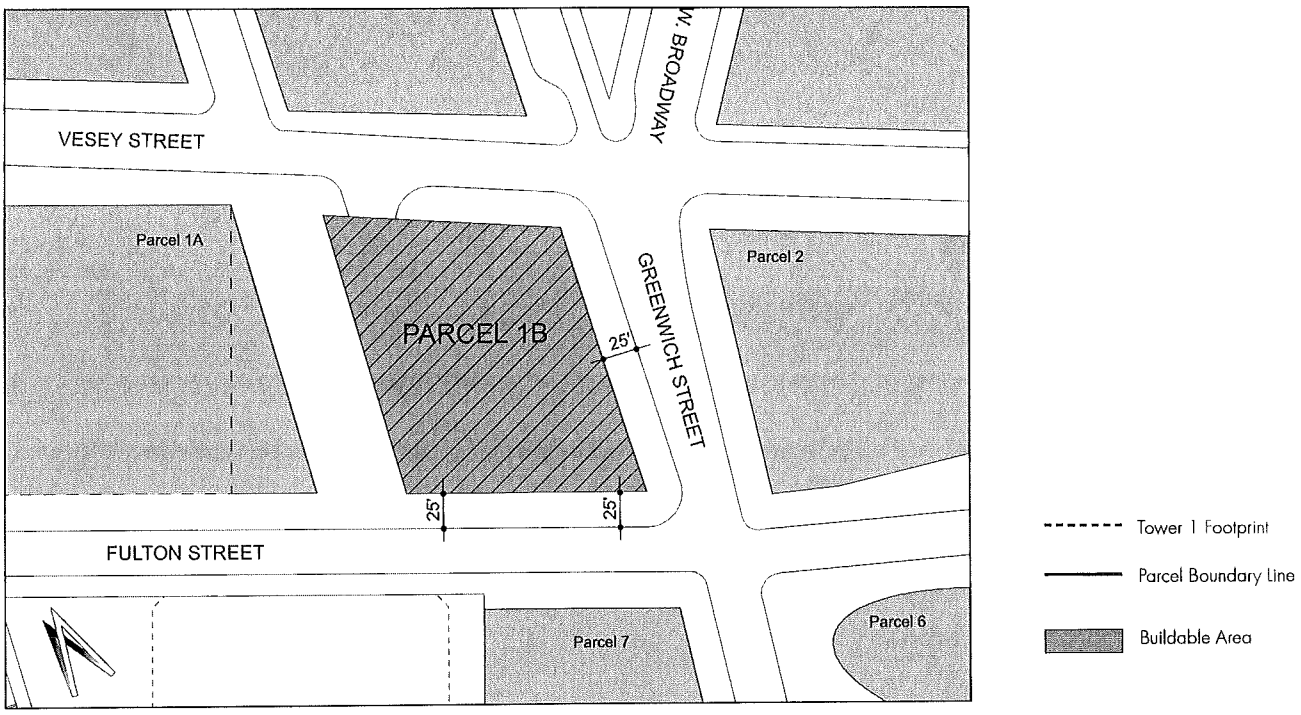
It is the culminating point of the spiraling composition of towers on the site.

The building's spire is reflective of the Statue of Liberty's Torch of Freedom.

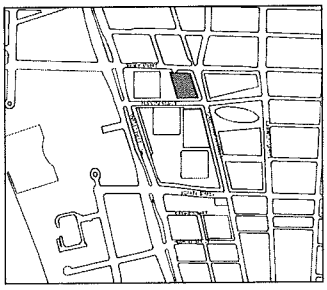
Its spire rises on the western edge of the site, making it visible along the length of Manhattan from the Hudson River Boulevard (Route 9A).

The tower will house a range of visitor facilities, including observation decks, restaurants and/or event spaces.

While Tower 1 should have a distinctive presence, it should also relate to Towers 2-5, as its height and crown are critical to the overall composition of towers on the site and on the horizon. Refer to Section 4.4.3: Form of Towers for more information on these relationships.



Parcel 1B is a cultural parcel with a highly visible and accessible location at the urban heart of the new World Trade Center site. It is the site of a proposed performing arts center, and its geometry is determined by alignments of existing streets and sidewalks, and the public space parcel it borders.



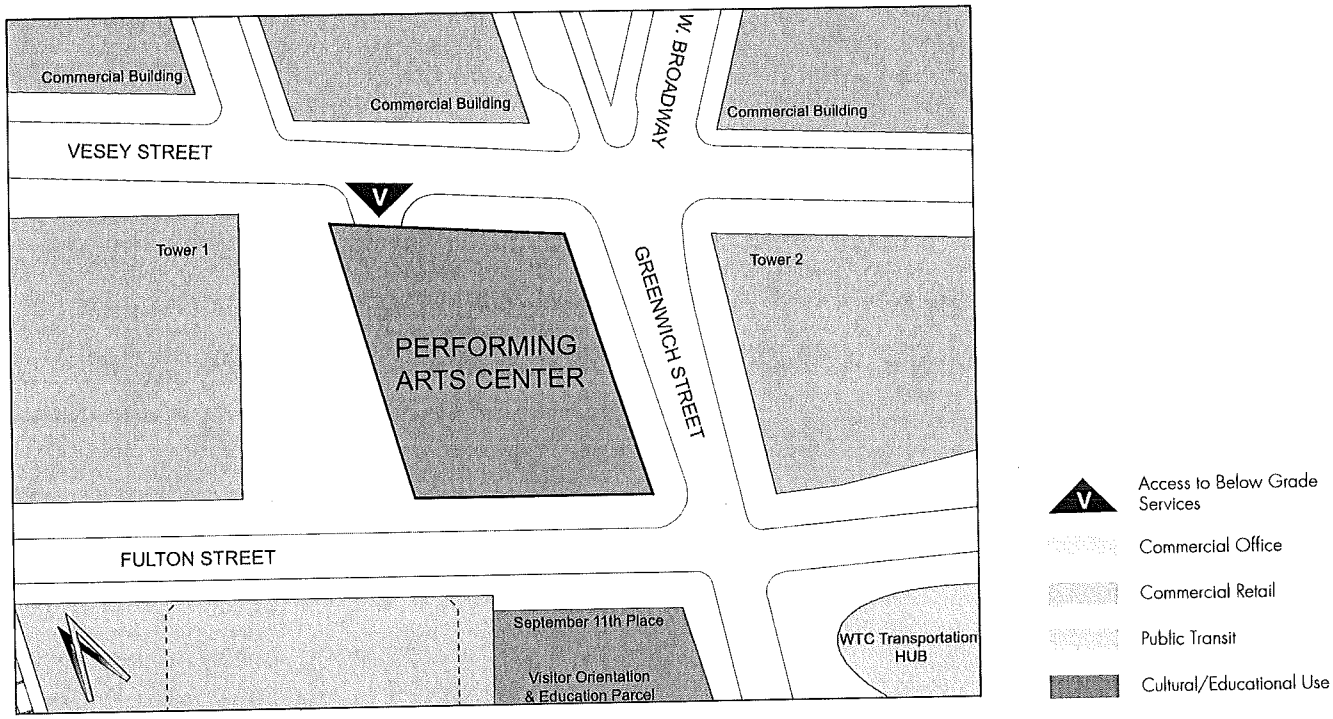
The northern edge of Parcel 1B is established by Vesey Street. The southern build-to line provides for a minimum 25' sidewalk width.

The eastern edge is established by Greenwich Street. The build-to line on the east provides for a minimum 25' sidewalk width and aligns with 7 World Trade Center.

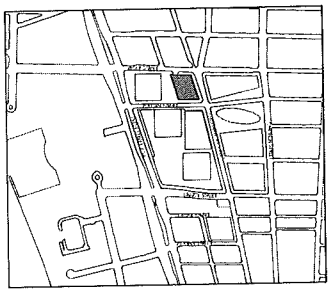
There shall be a 60' separation at-grade between the Performing Arts Center and Tower 1. This area, known as Washington Place, will accommodate activity from both Tower 1 and the Performing Arts Center. A public plaza will also be located in front of the Performing Arts Complex on Fulton Street, unless otherwise required by the program of the cultural institutions selected for the site.

5.2.2 Use and Access

Parcel 1B is a cultural parcel anticipated for use primarily as a Performing Arts Center above grade with multiple below-grade uses including support for the Performing Arts Center, retail, site servicing, parking, and MEP spaces. Retail uses may also be considered above grade, with all retail designed to encourage lively pedestrian-oriented streets.



Since Parcel 1B shares a block with commercial office parcel 1A it is important that the form and massing of the Performing Arts Center be able to distinguish its cultural uses.



Cultural uses will occupy all above-grade levels of Parcel 1B. A portion of the ground level space is designed to accommodate car elevators providing below-grade vehicular access.

Parcel 1B's location at the crossroads of the site affords it a strong relationship to the streets and public open spaces of the World Trade Center site. In particular, this parcel enjoys a central position along the Fulton Street corridor, across from the Wedge of Light Plaza, Memorial, and Visitor Orientation and Education Center and adjacent to Washington Place. The public lobby of this cultural building should be oriented towards the center of the site, the intersection of Fulton and Greenwich Streets. Its lobby should relate and open to September 11th Place across Fulton, which serves as the major access route to the memorial precinct. In order to activate the area around Parcel 1B, retail uses or restaurants may be located in the at-grade portions of the building accessing Washington Place.

5.3 Parcel 2

5.3.1 Parcel Location and Geometry

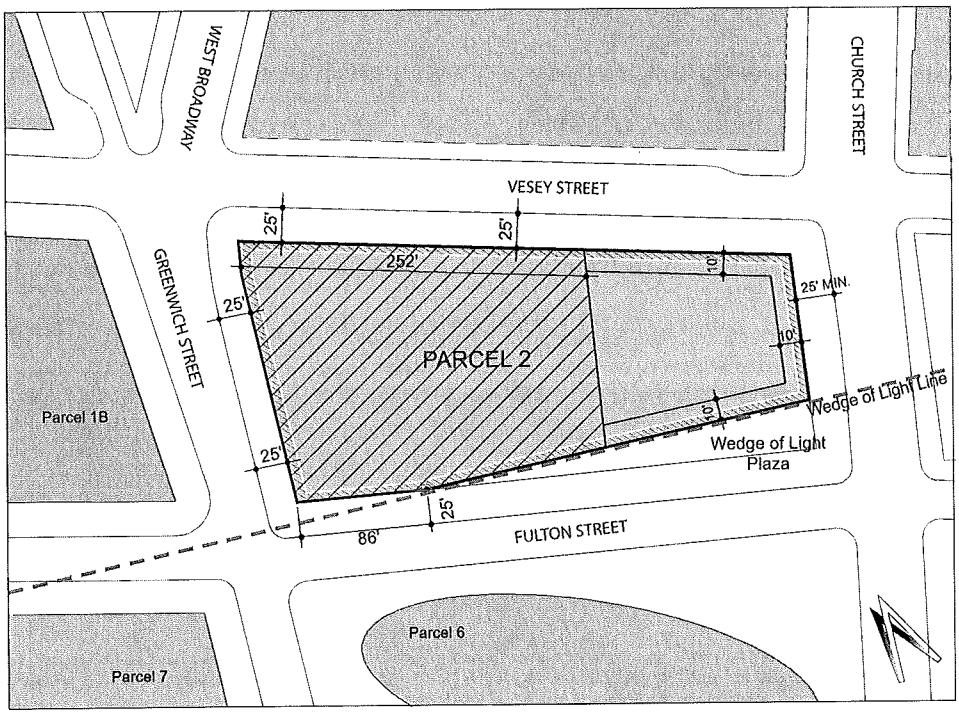
Parcel Boundary

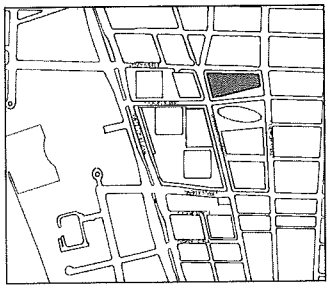
Building Footprint Line.
(Illustrative for diagramatic purposes only.)

Buildable Podium Area - 61,300 sf
Podium may occupy not more than 90% of total Buildable Podium Area.

Buildable Tower Area - 42,700 sf
Approximately 5% of this area should remain unbuilt.

Pedestrian circulation area at grade
Pedestrian area should occupy at least 10 % of total Buildable Podium Area.





Parcel 2 is a mixed use parcel containing office, retail and other associated uses above and below-grade. It is located at the heart of the site, opposite the PATH Transit Hall and Performing Arts Center.

The shape and size of the parcel responds to these considerations: providing appropriate sidewalks and streetscapes along Vesey and Greenwich Streets; and defining the northern edge of the Wedge of Light Plaza, a significant portion of the linked civic spaces along the Fulton Street corridor.

Parcel 2 will accommodate the second largest commercial office tower on the site, with approximately 2.3 million square feet of office space excluding Lobby, Mechanical Space, Retail, Restaurant Uses and Broadcast Facilities. Retail in Parcel 2 includes two below-grade levels accessed from the concourses, one level of street-oriented retail and potentially two or more levels above-grade. See Section 4.5.1 for table of areas. Maximum height of tower not to exceed elevation 1600'.

Tower shafts should not fill the entire Buildable Tower Area. Smaller footprints are encouraged to increase the amount of light and air between the towers and enhance the comfort of the pedestrian realm.

Uses for the ground level of Parcel 2 are office lobby, retail spaces and concourse access. Ground level retail should be designed to encourage lively pedestrian-oriented streets. Uses for podium level are the following: office lobby, public concourse, trading floors, office amenities, mechanical and retail spaces. Vertical connections within multi-level retail stores are extremely desirable. In addition to commercial office and retail uses, cultural and civic uses shall be permitted. Parking, storage and access to transit may be provided below-grade.

Pedestrian circulation area at grade as shown is illustrative only to diagram the proportion of open to built space. Architect should creatively design Pedestrian circulation area at grade to relate to the design of the building and enhance the pedestrian experience. Pedestrian space should be concentrated around Office Lobby, Retail and Transportation Entrances and in other locations where pedestrians congregate.

Exemption (4)

Office
Retail
Transit/Concourse
Mechanical
Service
Parking

PARCEL 2

This is an example of a potential distribution of uses in the podium. For information on the distribution of uses, see sections 4.4.3 and 4.13.

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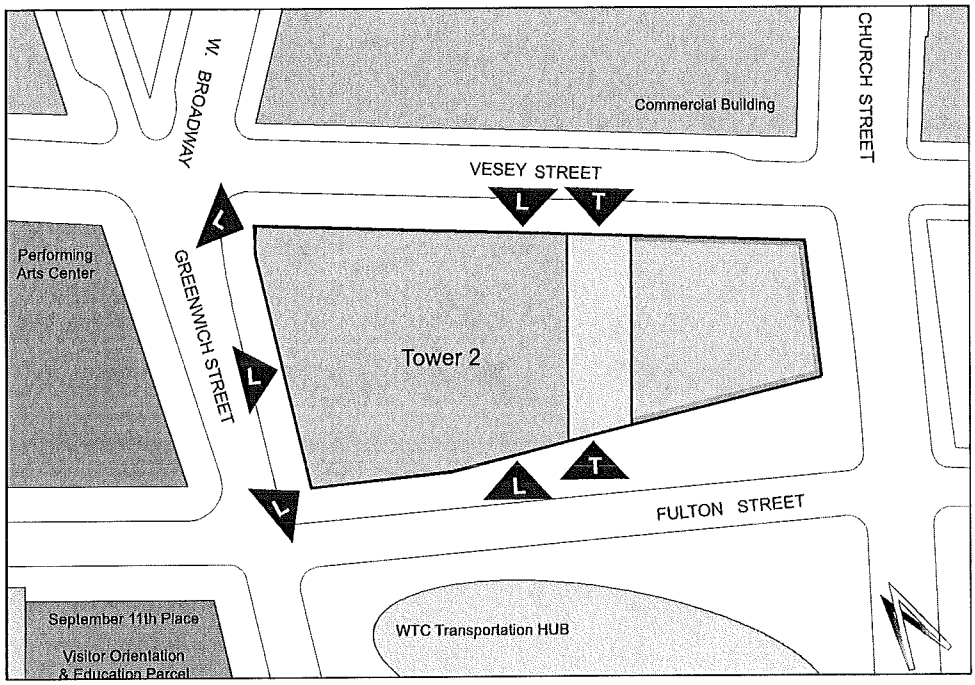
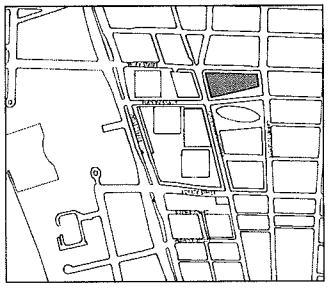


Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail, and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.



Parcel 2 will create the northeast anchor of the World Trade Center site. The building will be predominately an office tower with active uses occupying the pedestrian-oriented levels 1-3. This mix of uses – office lobbies, two public concourse access points and retail space — is meant to make Vesey, Church and Greenwich Streets, as well as the Wedge of Light Plaza, active urban spaces.

Office entries will be from Fulton, Greenwich and Vesey Streets. Pedestrians will be able to reach the office elevators from these streets. In addition, a direct link from the lobby to the below grade concourse is possible.

Retail spaces will have frontage on Fulton (the Wedge of Light), Church and Vesey Streets. Retail space should be designed to activate streets and public spaces. Retail frontage should be as transparent as possible to enhance visibility and create a strong connection between building interiors and the streetscape.

No permanent at-grade loading will be permitted. A separate entrance may be located at-grade within the office lobby or below-grade for office building services (messengers, etc.).

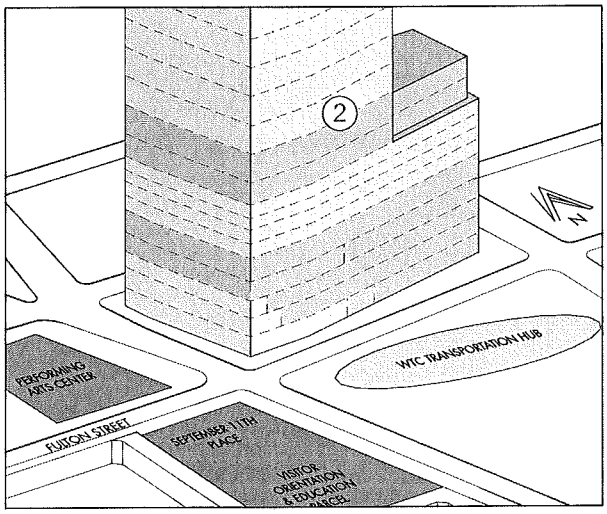
5.3.3 Building Massing

The building massing on Parcel 2 has two components, the podium and the office tower above.

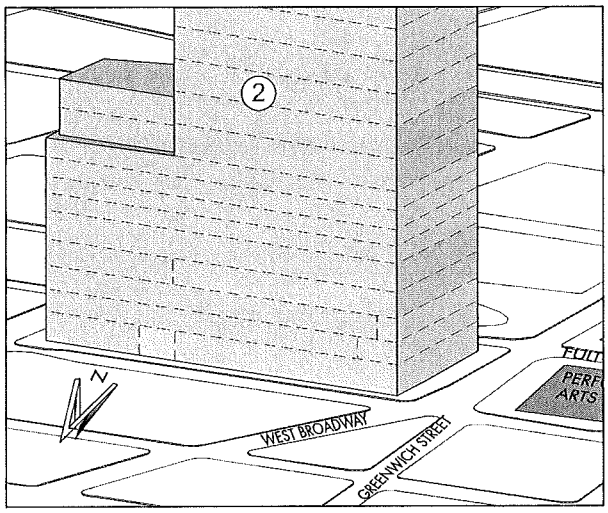
The podium program may include office lobby, public concourse, trading floors, office amenities, mechanical and retail spaces. The base is intended to establish the street and plaza edges, create consistent relationships with adjacent buildings and provide an appropriately scaled pedestrian zone.

The tower component of the massing has a smaller footprint than that of its base and is sited along Greenwich Street. This orientation complements the tower masses on Parcels 3 and 4 with Tower 3 along Church and Tower 4 along Greenwich. The staggered configuration of the three towers maximizes daylight and views for each and provides a better quality pedestrian experience on Cortlandt.

The two diagrams below illustrate the form of Tower 2's base, one possible configuration of its street level functions and the adjacent building forms and uses.



View of Southwest corner of Tower 2's Base



View of Northwest corner of Tower 2's base

Commercial Office

Commercial Retail

Public Transit

Cultural/Educational Use

Mechanical

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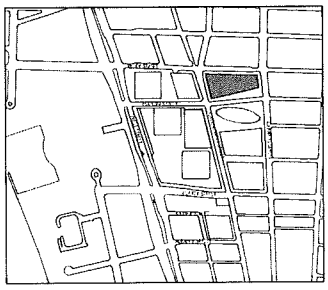
The height, top and streetwall setback of the tower portion of parcel 2 are critical to the overall composition of towers on the site and on the horizon.

Active light-filled streets and open spaces are central to the design of the World Trade Center site. To ensure this, it would be desirable that Tower 2's shaft become more slender as it rises.



5.4 Parcel 3

5.4.1 Parcel Location and Geometry

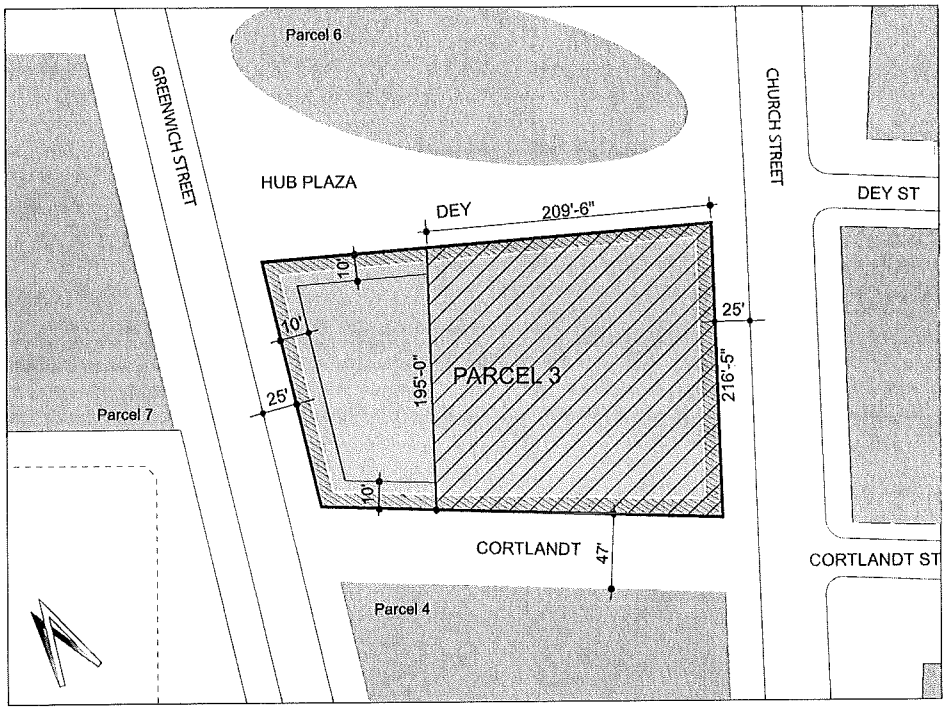
Parcel Boundary

Building Footprint Line.
(Illustrative for diagramatic purposes only.)

Buildable Podium Area - 61400 sf
Podium may occupy not more than 88 %
of total Buildable Podium Area.

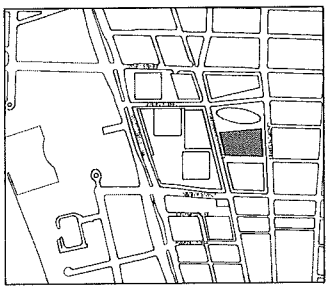
Buildable Tower Area - 42900 sf
Approximately 5% of this are
should remain unbuilt.

Pedestrian circulation area at grade
Pedestrian area should occupy at least 12 % of
total Buildable Podium Area.



Parcel 3 is a commercial office parcel located with shared uses on its lowest levels and below-grade. Taken together with the other office/retail parcels between Greenwich and Church streets (Parcels 2, 3 and 4), Parcel 3 acts as the center of the commercial core of the site.

The parcel responds to three site considerations: establishing appropriate streetscapes for Greenwich and Church Streets, with minimum 25' sidewalk widths; relating to the proposed WTC Transportation Hub, and relating to the re-introduction of Cortlandt through the site from Church to Greenwich Streets.



Parcel 3 allows for approximately 2.1 million sq ft of office space excluding Lobby, Mechanical Space, Retail, Restaurant Uses and Broadcast Facilities. Retail in Parcel 3 includes two below-grade levels accessed from the concourses, one level of street-oriented retail, and potentially two additional levels above-grade. See Section 4.5.1 for table of areas. Maximum height of tower not to exceed elevation 1500'.

Tower shafts should not fill the entire Buildable Tower Area. Smaller footprints are encouraged to increase the amount of light and air between the towers and enhance the comfort of the pedestrian realm.

Uses for the ground level of Parcel 3 are office lobby, retail spaces and transportation entries. Ground level retail should be designed to encourage lively pedestrian-oriented streets. Uses for the podium areas are the following: office lobby, public concourse, trading floors, office amenities, mechanical and retail spaces. Vertical connections within multi-level retail stores above and below grade are extremely desirable. In addition to commercial office and retail uses, cultural and civic uses shall be permitted. Parking, storage and access to transit may be provided below grade.

Pedestrian circulation area at grade as shown is illustrative only to diagram the proportion of open to built space. Architect should creatively design pedestrian circulation area at grade to relate to the design of the building and enhance the pedestrian experience. Pedestrian space should be concentrated around Office Lobby, Retail and Transportation Entrances and in other locations where pedestrians congregate.

Exemption (4)

Office
Retail
Mechanical
Service
Parking
Transit / Concourse

PARCEL 3

This is an example of a potential distribution of uses in the podium. For information on the distribution of uses, see sections 4.4.3 and 4.13

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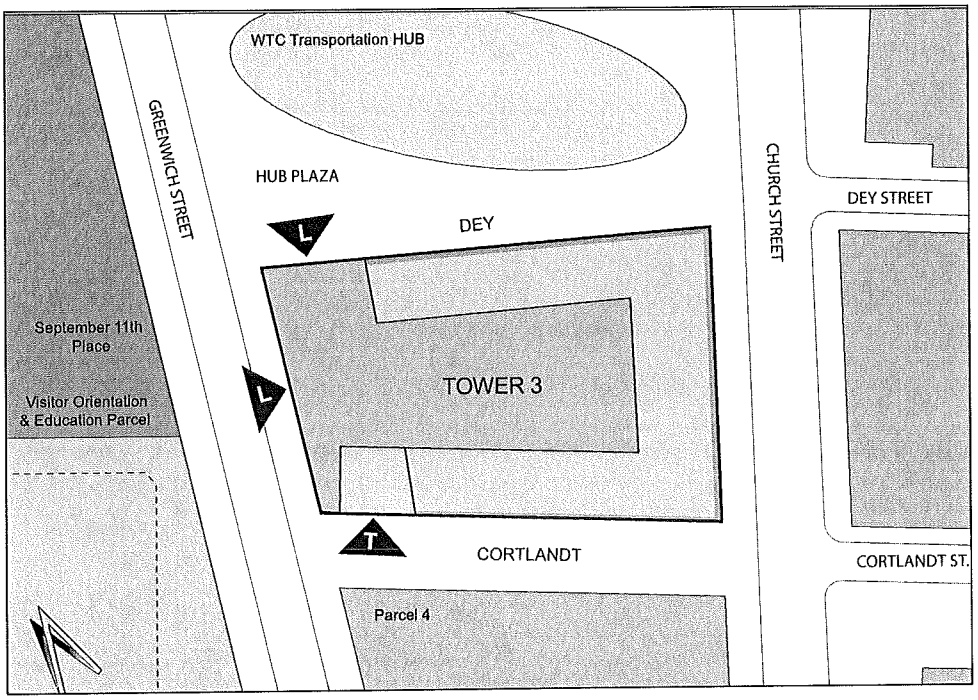
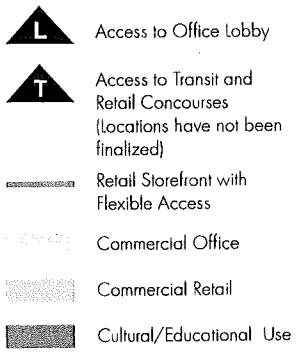
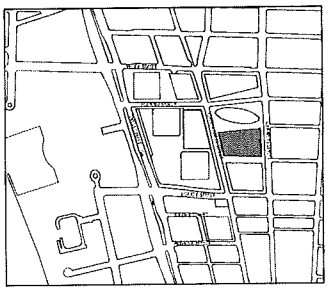




Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail, and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.



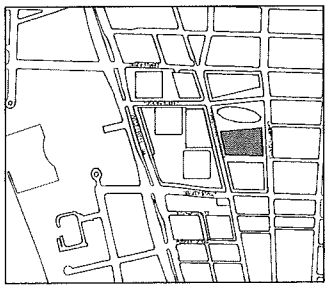
Parcel 3, which sits just south of the WTC Transportation HUB and HUB Plaza, should be designed to take advantage of this proximity. Below grade it offers the opportunity for retail spaces that are connected with the Transit Hall, and it offers considerable frontage on each side for ground-oriented retail spaces.

Office entries will be from Greenwich and Dey. A direct link to the below-grade concourse from the lobby is possible. The north-south concourse is located below, mid-block between Church and Greenwich streets, and can be accessed from the office tower.

Retail commercial space occupies the remainder of the ground level of Parcel 3. This retail has frontage on Church, Dey and Cortlandt. Retail space should be designed to activate streets and public spaces. Retail frontage should be as transparent as possible to enhance visibility and create a strong connection between building interiors and the streetscape.

No permanent at-grade loading will be permitted. A separate entrance may be located at-grade within the office lobby or below-grade for office building services (messengers, etc.).

5.4.3 Building Massing

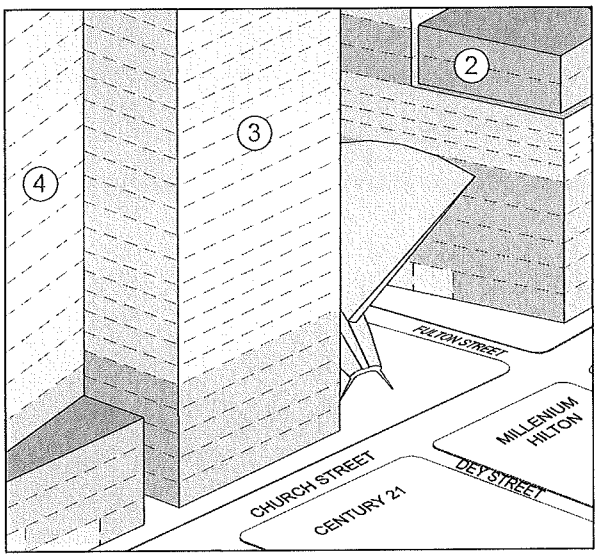


The building massing on Parcel 3 has two components, the podium and the office tower above.

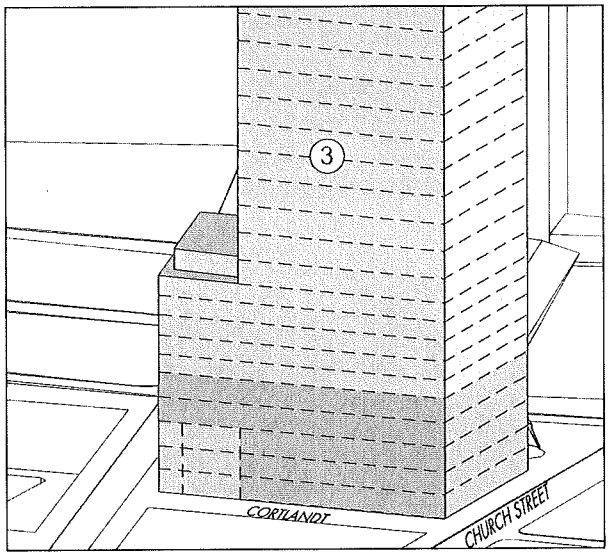
The podium program may include office lobby, public concourse, trading floors, office amenities, mechanical and retail spaces. The base is intended to establish the street edges, create compatible relationships with adjacent buildings and provide an appropriately scaled pedestrian zone.

The tower component of the massing has a smaller footprint than that of its base and is sited along Church Street. This orientation complements the tower masses on Parcels 2 and 4 which are sited along Greenwich Street. The staggered configuration of the three towers maximized daylight and views for each and provides a better quality pedestrian experience on Cortlandt.

Refer to the diagrams below for illustration of one possible relationship between Tower 3's base and tower, along with the configuration of its street-level uses and their relationships to other uses on the site.



View of the Southeast corner of Tower 3's base



View of the Northeast corner of Tower 3's base

Commercial Office

Commercial Retail

Public Transit

Cultural Use

Mechanical

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The height, top and streetwall setback of the tower portion of Parcel 3 are critical to the overall composition of towers on the site and on the horizon.

Active, light-filled streets and open spaces are central to the design of the World Trade Center site. To ensure this, it would be desirable that the shaft of Tower 3 become more slender as it rises.

The designs of Tower 3 and Tower 4 should attempt to maximize the amount of light and air in the space between the two towers.

5.5 Parcel 4

5.5.1 Parcel Location and Geometry

Parcel Boundary

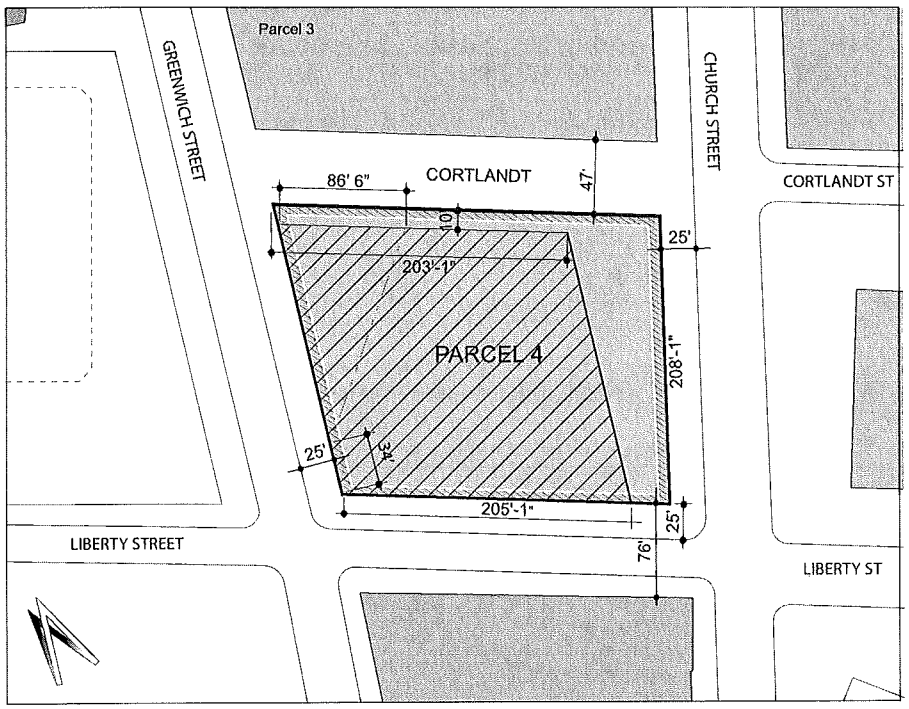
Building Footprint Line.
(Illustrative for diagramatic purposes only.)

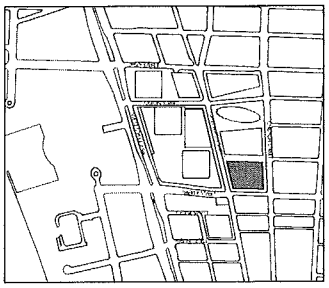
Buildable Podium Area - 54,000 sf
Podium may occupy not more than 92 % of total Buildable Podium Area.

Buildable Tower Area - 41,700 sf
Approximately 5% of this space should remain unbuilt.

Pedestrian circulation area at grade within Buildable Podium Area
Pedestrian area should occupy at least 8 % of total Buildable Podium Area.

Required Tower setback at Elevation 714' above ground





Parcel 4 is a commercial office parcel with retail uses on its lower levels and below-grade. It anchors the south end of the commercial core of the new World Trade Center, between Church and Greenwich Streets.

As with Parcel 3, the important relationships of the parcel are to the surrounding streets – Church, Greenwich and Liberty – and to Cortlandt. In each case, sidewalk widths must be provided as illustrated in the diagram above.

Parcel 4 allows for approximately 1.8 million sq ft of office space excluding Lobby, Mechanical Space, Retail, Restaurant Uses and Broadcast Facilities. Retail on Parcel 4 includes two below-grade levels accessed from the concourses, one level of street-oriented retail and potentially two levels above-grade. See Section 4.5.1 for the table of areas. Maximum height of tower not to exceed elevation 1300'.

Tower shafts should not fill the entire Buildable Tower Area. Smaller footprints are encouraged to increase the amount of light and air between the towers and enhance the comfort of the pedestrian realm.

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Uses for the ground level of Parcel 4 are the office lobby, retail spaces and access to the concourse. Ground level retail should be designed to encourage lively pedestrian-oriented streets. Uses for the podium areas are the following: office lobby, public concourse, office amenities, mechanical and retail spaces. Vertical connections within multi-level retail stores above and below grade are extremely desirable. In addition to commercial office and retail uses, cultural and civic uses shall be permitted.

Parking, storage and access to transit may be provided below-grade.

Pedestrian circulation area at grade as shown is illustrative only to diagram the proportion of open to built space. Architect should creatively design Pedestrian circulation area at grade to relate to the design of the building and enhance the pedestrian experience. Pedestrian space should be concentrated around Office Lobby, Retail and Transportation Entrances and in other locations where pedestrians congregate.

Exemption (4)

Office
Retail
Transit/Concourse
Mechanical
Service
Parking

PARCEL 4

This is an example of a potential distribution of uses in the podium. For information on the distribution of uses, see sections 4.4.3 and 4.13.

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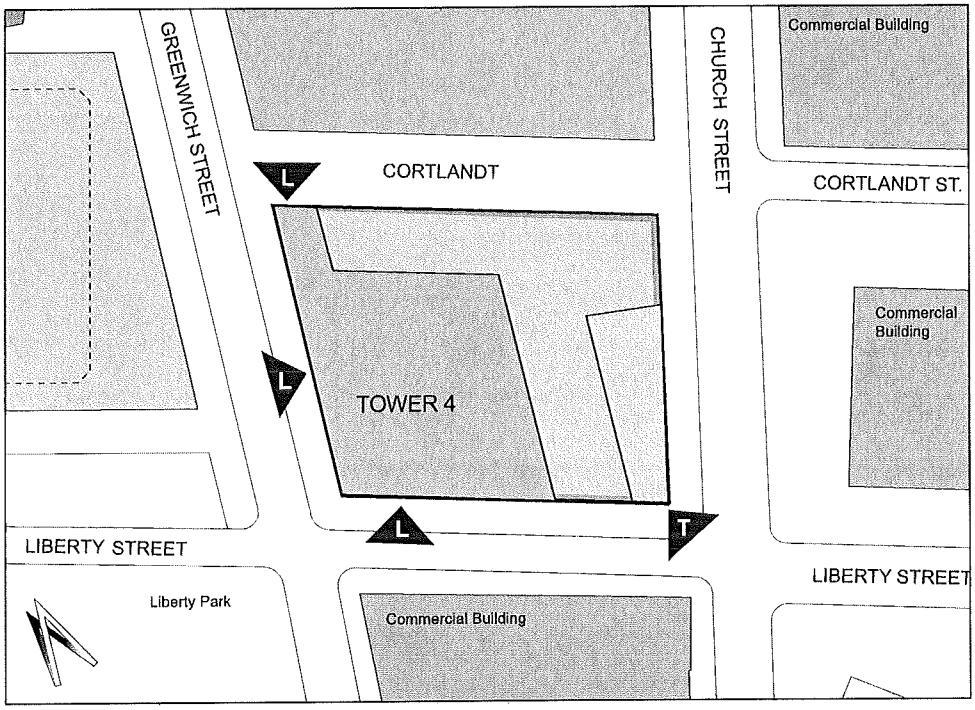
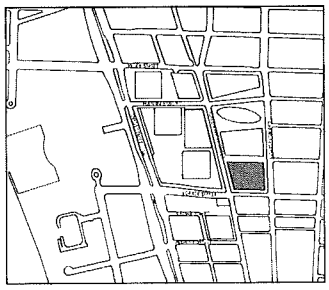


Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail, and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.



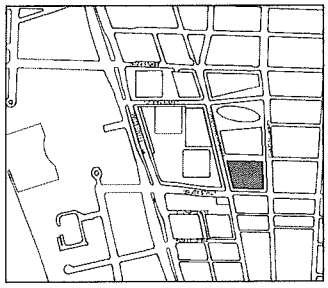
The development of Parcel 4 must be closely coordinated with Parcel 3, to which it is connected below grade. The mixed-use development should ensure that Liberty, Church and Greenwich Streets and Cotlandt are busy pedestrian streets, lined with active uses.

Entrances to the commercial tower will be on Greenwich Street, Liberty Street and Cortlandt. In addition, a direct link for the lobby to the below-grade concourse is possible. Primary access to the concourse will be located at the corner of Liberty Street and Church Street.

Retail space will occupy the ground level of Parcel 4 along the Church Street and Cortlandt frontages. Retail space should be designed to activate streets and public spaces. Retail frontage should be as transparent as possible to enhance visibility and create a strong connection between building interiors and the streetscape.

No permanent at-grade loading will be permitted. A separate entrance may also be located at-grade within the office lobby or below-grade for office building services (messengers, etc.).

5.5.3 Building Massing

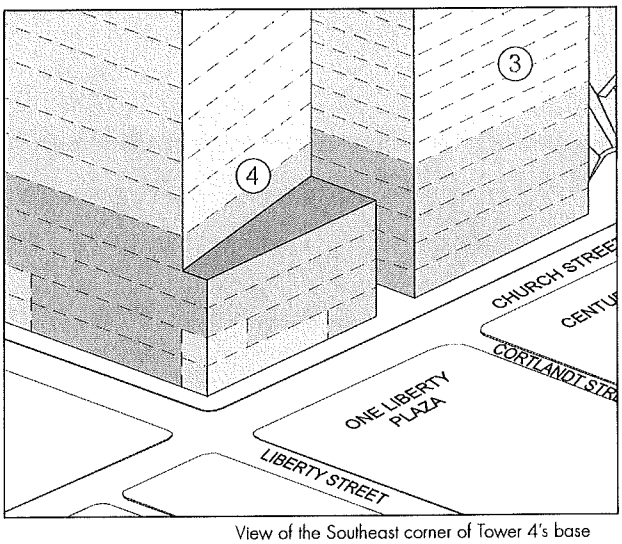


Like Parcel 3, the building massing on Parcel 4 has two components, the podium and the office tower above.

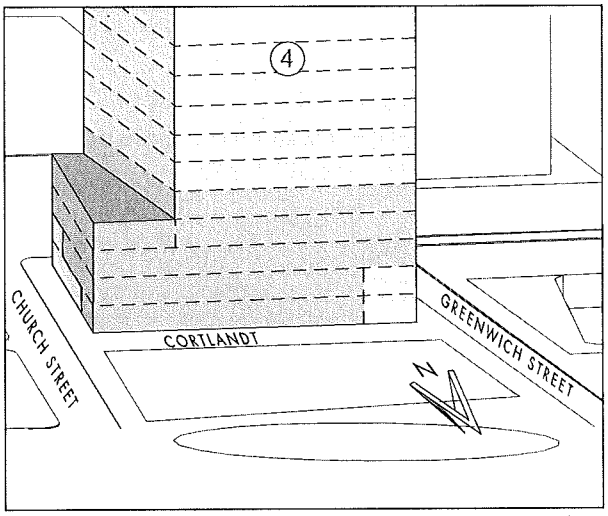
The podium program may include office lobby, public concourse, trading floors office amenities, mechanical and retail spaces. The base is intended to establish the street edges, create consistent relationships with adjacent buildings and provide an appropriately scaled pedestrian zone.

The lower component of the massing has a smaller footprint than that of its base and is sited along Greenwich Street. This orientation complements the tower mass on Parcel 3 with the staggered locations of towers maximizing daylight and views for each and providing a better quality pedestrian experience on Cortlandt.

Refer to the two diagrams below for illustration of one possible relationship between Tower 4 and its base, along with the configuration of street-level uses and the relationships of these to other uses on the site.



View of the Southeast corner of Tower 4's base



View of the Northeast corner of Tower 4's base

Commercial Office

Commercial Retail

Public Transit

Cultural Use

Mechanical

FEBRUAURY 07

The height, top and streetwall setback of the tower portion of Parcel 4 are critical to the overall composition of towers on the site and on the horizon.

Active, light-filled streets and open spaces are central to the design of the World Trade Center site. To ensure this, it would be desirable that Tower 4 shaft becomes more slender as it rises.

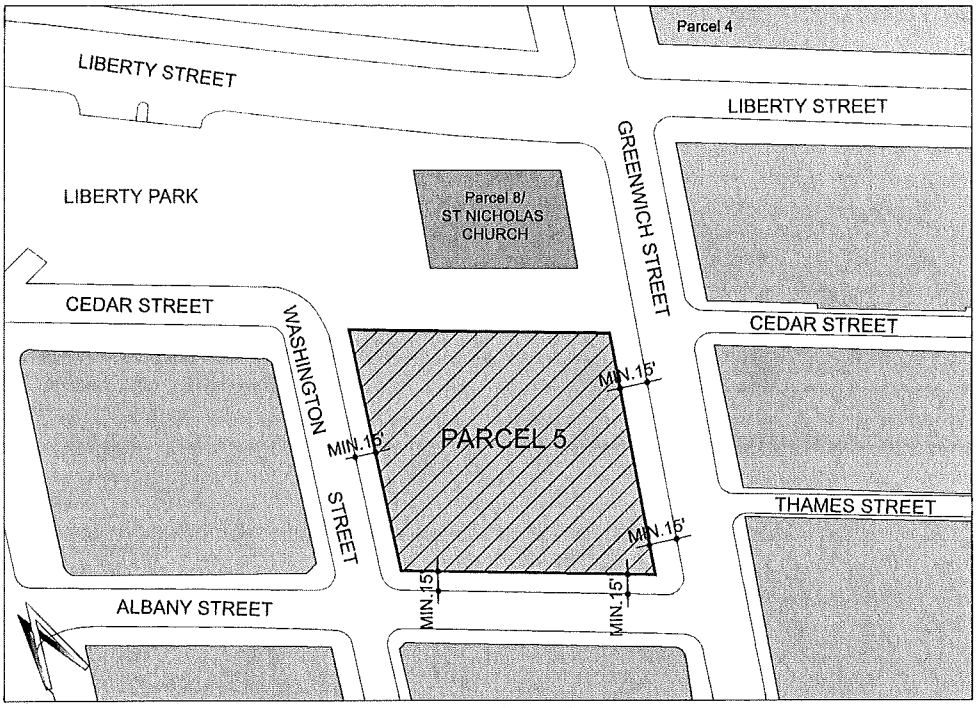
The designs of Tower 4 and Tower 3 should attempt to maximize the amount of light and air in the space between the two towers.

5.6 Parcel 5

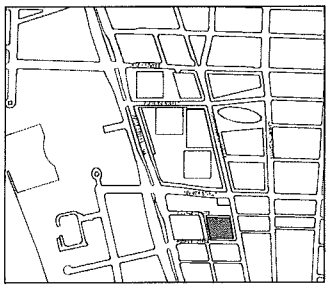
5.6.1 Parcel Location and Geometry

Parcel Boundary

Buildable Podium Area - 32,000 sf
Podium may occupy any part of the included area
Buildable Tower Area - 32,000 sf



Diagrams including Parcel 8/St. Nicholas Church are illustrative of its possible location



Parcel 5 is a commercial office parcel with retail uses on its lower levels. It will anchor the southern edge of new development and will help to define Greenwich Street. Parcel 5 will also benefit greatly from its relationship to open space Site E (Liberty Park).

The important relationships of the parcel are to the surrounding streets – Greenwich, Washington and Albany as well as Liberty Park.

If, in the future, the use of Parcel 5 changes from commercial office use to another use, such as residential, the height and bulk parameters for Tower 5 must be reconsidered. In addition, the location of entry and exit points, provisions for ground level retail, and appropriate sidewalk widths should be reconsidered. Any change in use must be accompanied by the provision of 25' minimum sidewalks along Greenwich, Albany and Washington Streets consistent with site-wide standards.

Parcel 5 will accommodate the smallest office tower on the World Trade Center site, with 1.3 million square feet of office space. Retail in Parcel 5 includes one or two levels of street-oriented retail. See Section 4.5.1 for the table of areas. Maximum height of tower not to exceed 1200'

Uses for the ground level of Parcel 5 are the office lobby and retail spaces. Ground level retail should be designed to encourage lively pedestrian-oriented streets. Vertical connections within multi-level retail stores are extremely desirable. The uses for level 2 are office and retail spaces. In addition to commercial office and retail uses, cultural and civic uses shall be permitted.

Storage may be provided below-grade.

Exemption (4)

Transit/Concourse
Mechanical
Service
Truck Delivery

PARCEL 5

This is an example of a potential distribution of uses in the lower floors of the tower.

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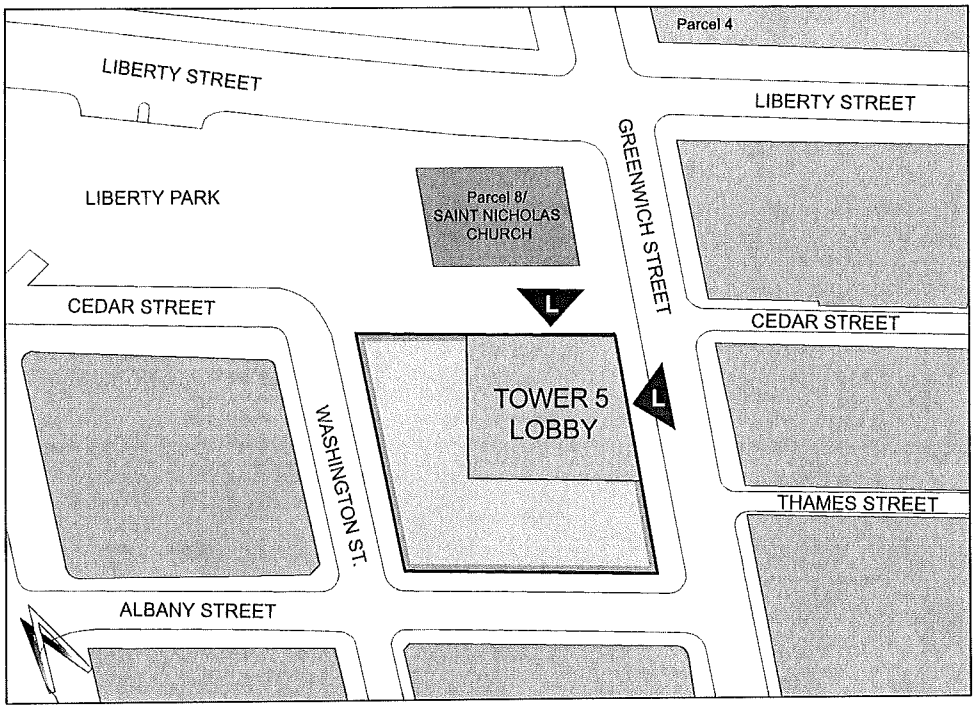
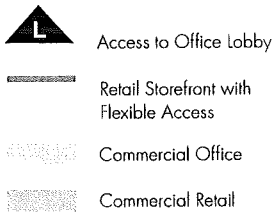
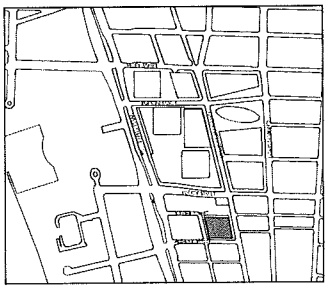




Note regarding axonometric diagrams and parcel plans:
The distribution of at-grade space between office lobby, retail, and public transportation programs remains to be determined. These diagrams are illustrative of street frontages and approximate locations.



Parcel 5 will anchor the south edge of the World Trade Center site and in doing so connect the new development with the Lower Manhattan neighborhood south of Liberty Street. Parcel 5 will be predominantly an office parcel providing for retail uses on its ground and second levels. These uses will add life to Cedar, Washington, Albany and Greenwich Streets.

Access to the office lobby could be on the north side of Tower 5 and/or Greenwich Street. Retail space will occupy the remainder of the parcel's ground level, with frontage on Greenwich, Washington and Albany Streets. Retail space should be designed to activate streets and public spaces Retail frontage should be as transparent as possible to enhance visibility and create a strong connection between Building interiors and the streetscape.

No permanent at-grade loading will be permitted. A separate entrance may be located at-grade for office building services (messengers, etc.).

The design, construction and operation of the portion of Liberty Park in the area generally north of Parcel 5 will be consistent with the Commercial Office Developer's anticipated design, construction and operation of Parcel 5 (including the location of one of the entrances to Parcel 5 on the north side of the tower across from Liberty Park) and will conform to the reasonable requirements of the Commercial Office Developer in connection with Parcel 5, including reasonable requirements for vehicle and pedestrian access, circulation and other matters.

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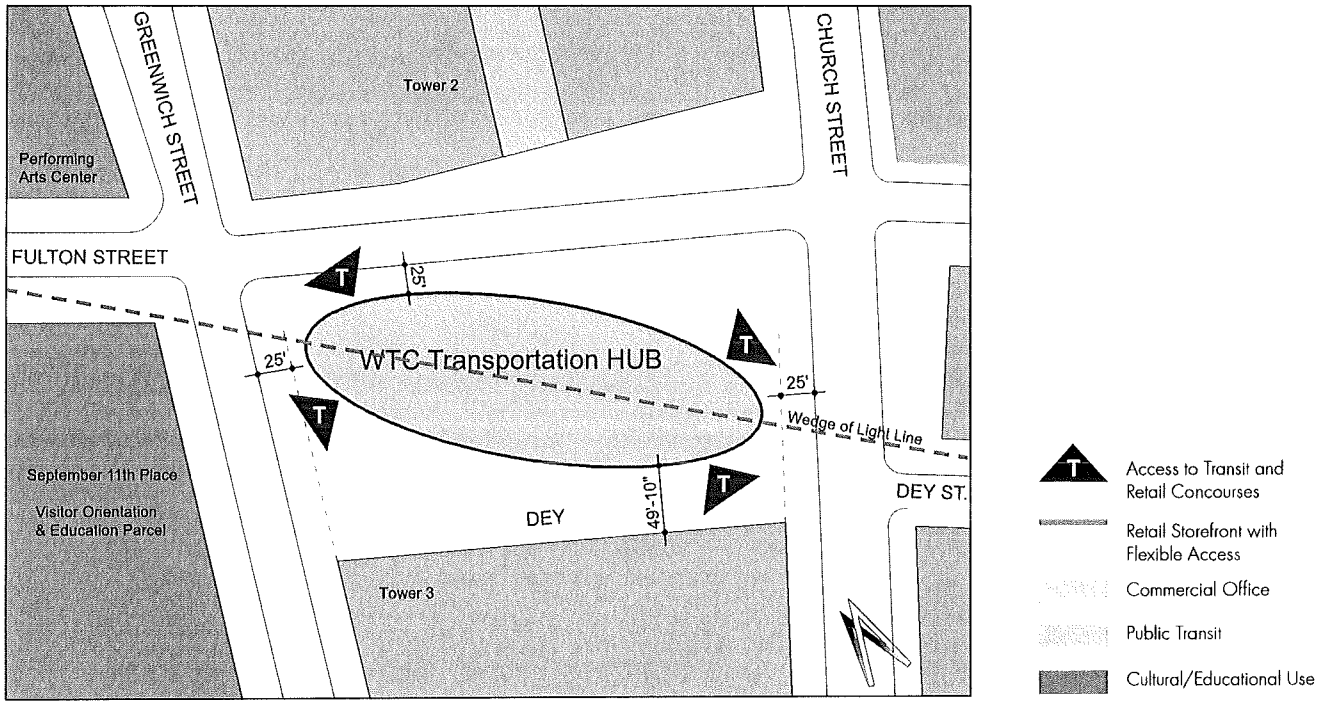
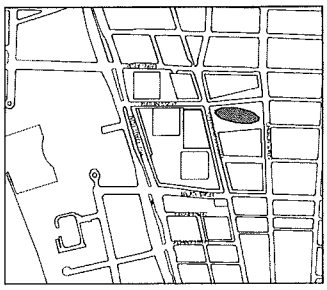
5.6.3 Building Massing

The height and top of the tower portion of Parcel 5 are critical to the overall composition of towers on the site and on the horizon.

Active, light-filled streets and open spaces are central to the design of the World Trade Center site. To ensure this, it is desirable that the shaft of Tower 5 should become more slender as it rises.

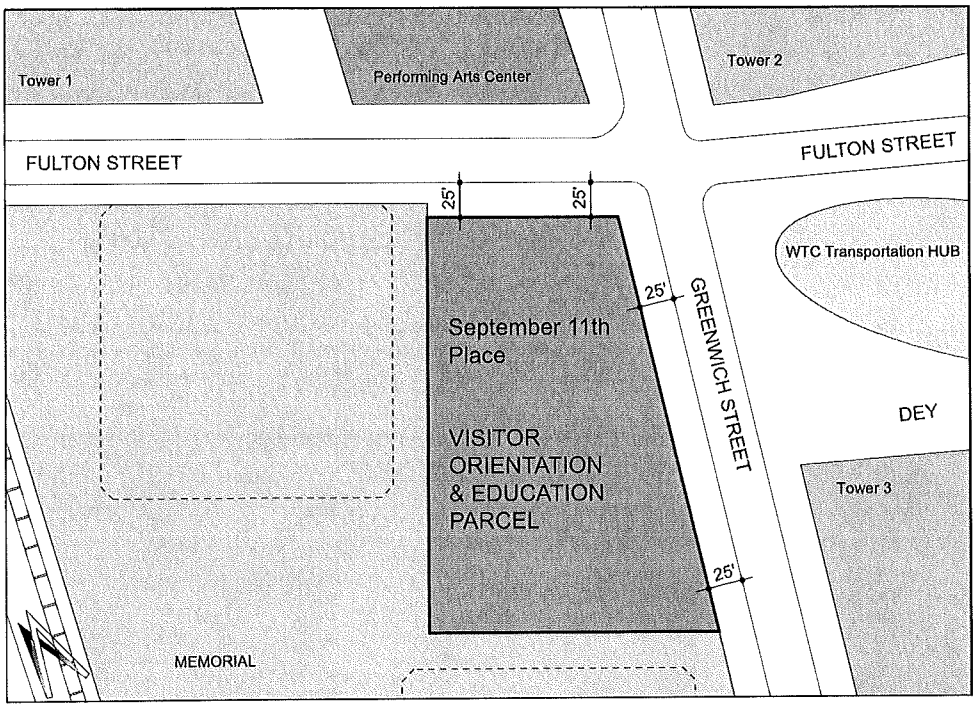


The ground level of Parcel 6 is the PATH Transit Hall. The sweeping, daylight-filled Hall will provide generous access to and from the transportation systems it organizes on its lower levels. Although access points occur at a number of locations around the site, the ground level of the hall will be a major and symbolic entrance to Lower Manhattan. It will provide access to the below-grade transportation network from entries located on Greenwich and Church streets, the Wedge of Light Plaza and other at-grade connections.



Parcel 7 5.8

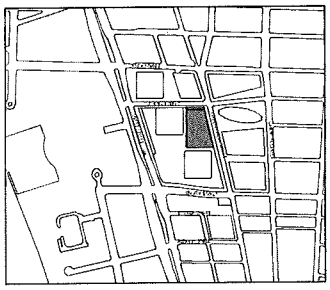
Use and Access



Commercial Office

Public Transit

Cultural/Educational Use



The parcel indicated here will accomodate both the Visitor Orientation & Education Center and the public open space of September 11th Place. Together, they will serve as a gateway as well as a transitional zone between the sober Memorial space and the lively street activity at that location.

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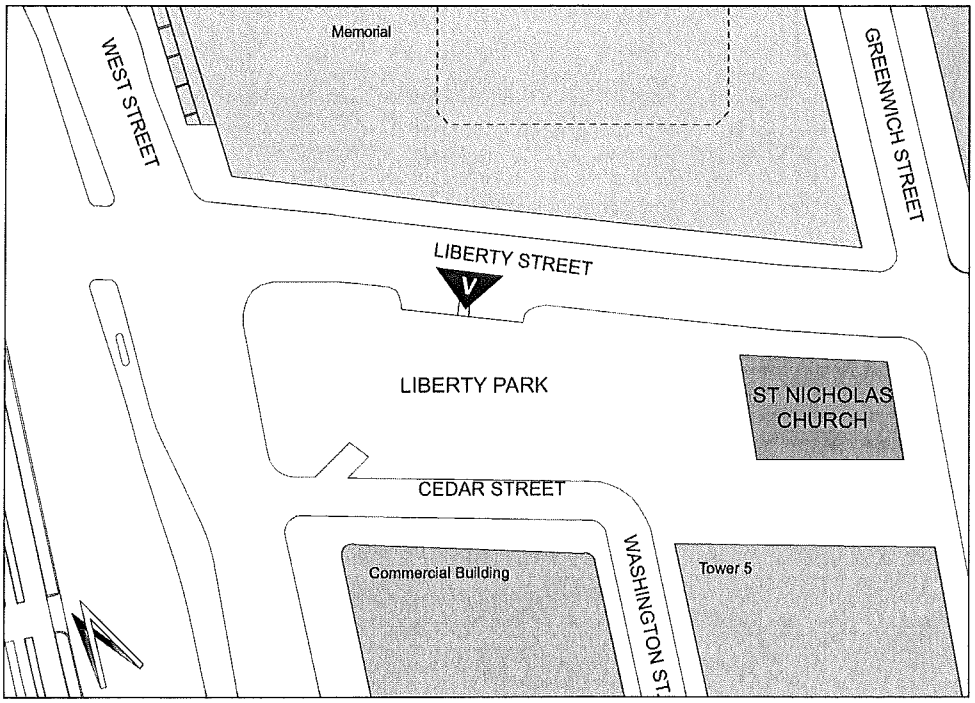
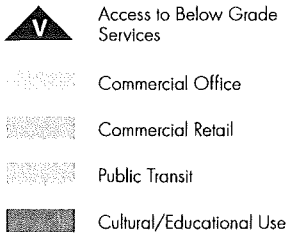
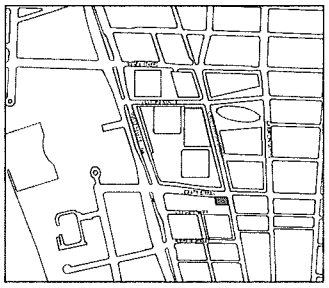
Use and Access





Diagrams including Parcel 8/St. Nicholas Church are illustrative of its possible location.

St. Nicholas Greek Orthodox Church was located on Cedar Street prior to September 11th and is intended to be rebuilt within the new park. Following its destruction, the church has renewed and broadened its mission, reaching out to all members of the Lower Manhattan community. In addition to serving the neighboring population, the rebuilt church will become a welcome point for international visitors coming to the site.



FEBRUAURY 07

PUBLIC OPEN SPACE GUIDELINES 6

These guidelines establish a site-wide identity for the public open spaces of the World Trade Center site. That identity includes a range of characteristics based on specific conditions. Designs proposed for specific open space sites should be evaluated as to how they support and complement the overall vision for the public realm. The guidelines also establish a framework for integrating the newly designed open spaces with the surrounding existing streets and neighborhoods. In the tradition of New York City's best public places, the guidelines call for hardscape and landscape material of the highest quality, and site furnishings which complement the buildings on the site.

Public Open Space Overview 6.1

Sites A-D: Wedge of Light Plaza, Hub Plaza, September 11th Place and Washington Place 6.2

Principles and Overview 6.2.1
Form of Spaces 6.2.2
Uses and Activities 6.2.3
Hardscape, Furnishings, and Lighting Guidelines 6.2.4
Landscape Material Guidelines 6.2.5

Site E: Liberty Park 6.3

Principles and Overview 6.3.1
Form of Spaces 6.3.2
Uses and Activities 6.3.3
Hardscape, Furnishings, and Lighting Guidelines 6.3.4
Landscape Material Guidelines 6.3.5

Streetscapes 6.4

Principles and Overview 6.4.1
Hardscape, Furnishings, and Lighting Guidelines 6.4.2
Landscape Material Guidelines 6.4.3
Streetscape Integration 6.4.4
Street Specific Descriptions 6.4.5

Environmental Factors 6.5

Security 6.6

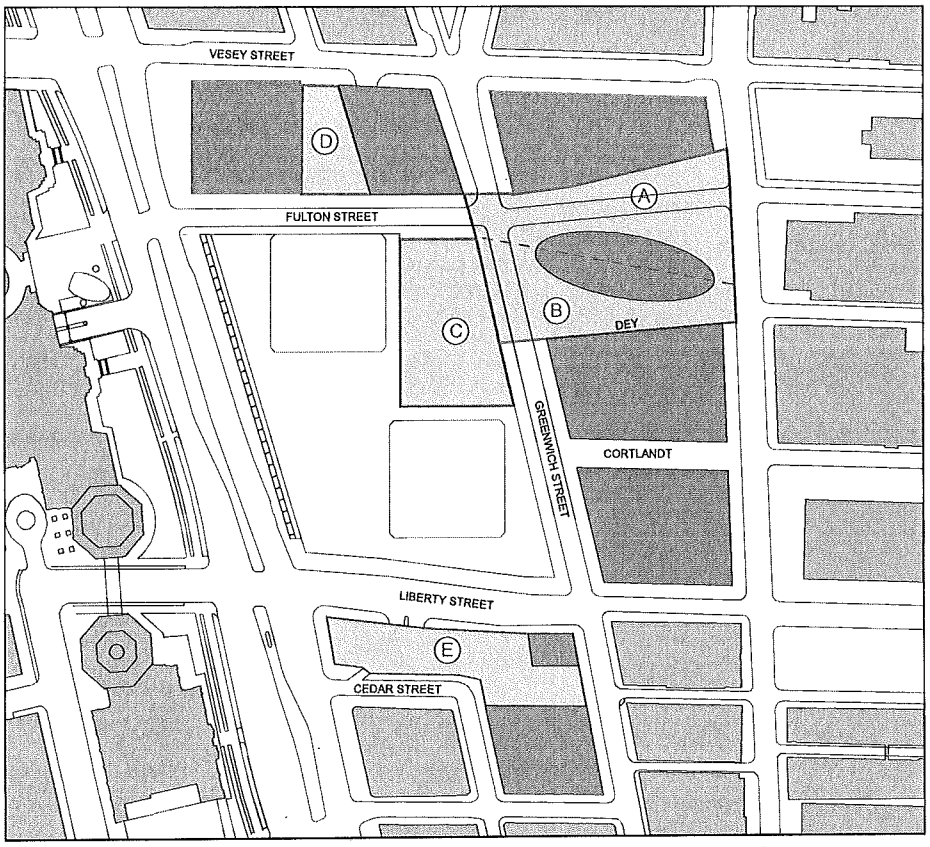
Heroes' Matrix 6.7

6.1 Public Open Space Overview

Central to the success and identity of the new World Trade Center site will be the grandeur, coherence, and vibrancy of its streets, sidewalks, and open spaces. The designs of the public sidewalks and public parks will give a unique character and unity to the whole project. The design of the public realm should be planned holistically to create a powerful and reverent setting for the memorial, to support site development, and to create a new public place.

With these ideas in mind, the design of the public open spaces should be guided by a number of objectives:

- Employ a unified palette of landscaping, paving, lighting, and furnishings to create a distinctive unified appearance across the World Trade Center site, but one that relates to the existing open spaces of Lower Manhattan.
- Develop the streets and sidewalks as the framework that ties the public realm of the WTC site together within which the public open spaces exist as focal points.
- Develop a range of public open spaces that create new destinations for Lower Manhattan.
- Allow for a variety of uses including civic gatherings and performances, as well as traditional park activities like reading, picnicking and relaxing.
- Introduce street trees to create green corridors, where appropriate and viable.
- Frame significant urban vistas through the thoughtful orientation of streets, buildings, and landscape elements.
- Develop a strategy that meets the criteria for security, but does not impede the movement of pedestrians and visual continuity of street trees, lighting and furnishings.
- Encourage the placement of public art and water features where appropriate.
- Work with the New York State Department of Transportation to coordinate streetscape development with that of West Street (Route 9A).
- Design the streets, sidewalks and public open spaces to comply with the Americans with Disabilities Act.



Site C: September 11th Place will include the Visitor Orientation & Education Center; Size and exact location TBD.

Ⓐ Wedge of Light
Ⓑ HUB Plaza
Ⓒ September 11th Place
Ⓓ Washington Place
Ⓔ Liberty Park

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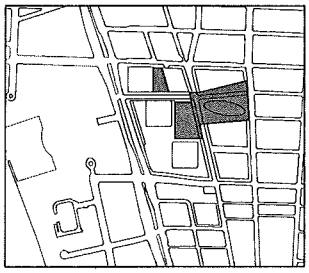
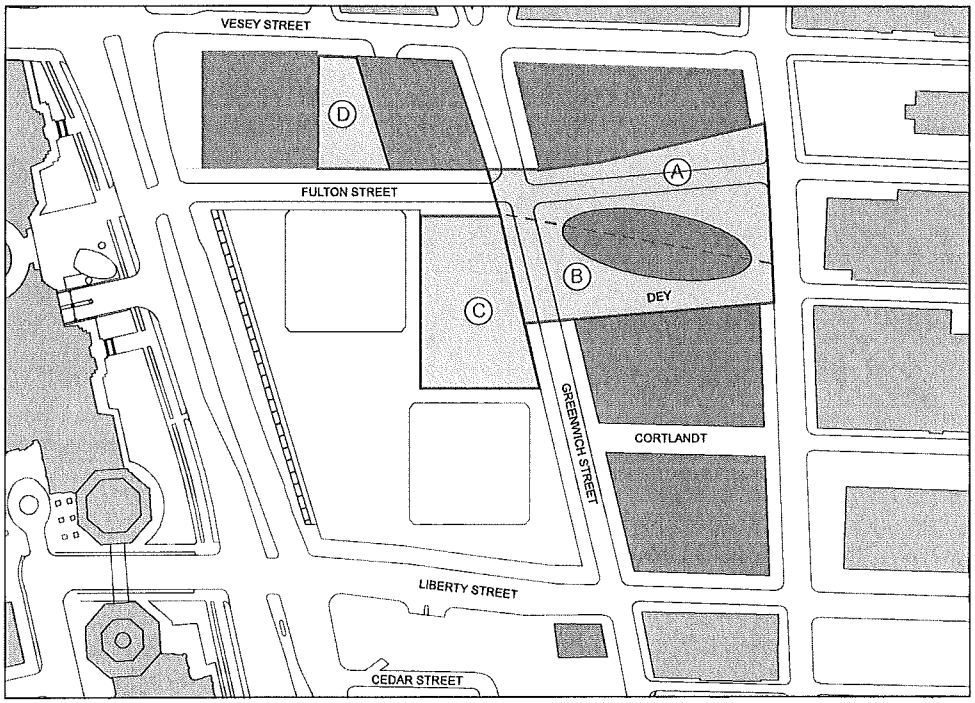
6.2 Sites A-D: The Wedge of Light Plaza, Hub Plaza, September 11th Place, and Washington Place

6.2.1 Principles and Overview





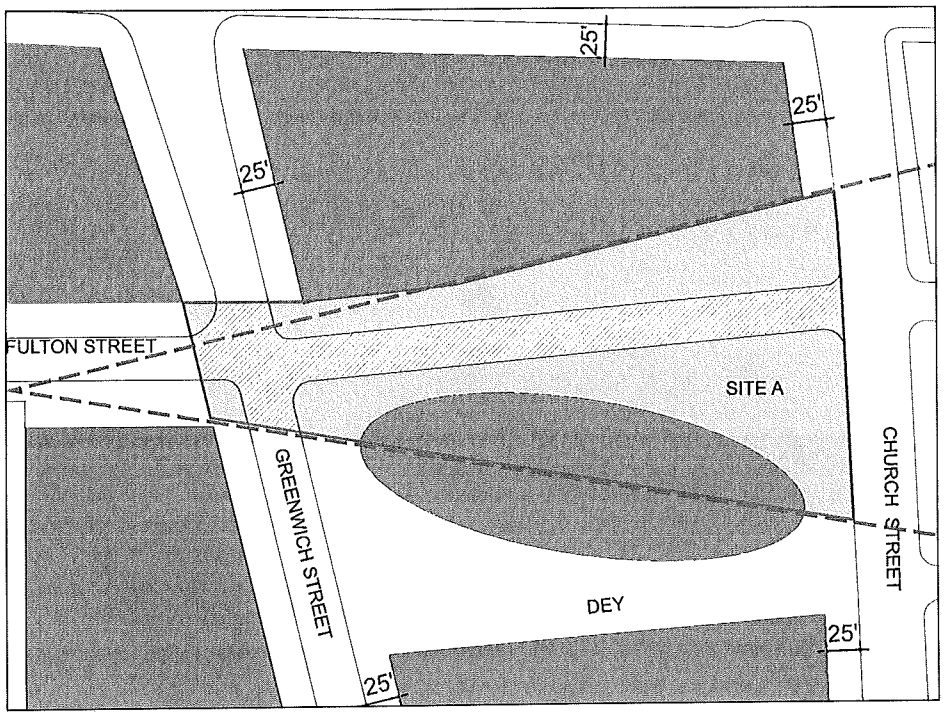
Site Boundary Line ——

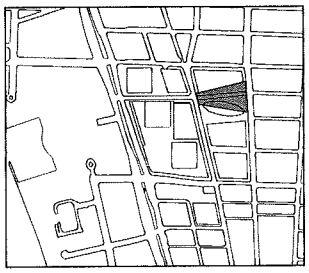
Area to Remain Open

Site C: September 11th Place will include the Visitor Orientation & Education Center; Size and exact location TBD.

Running east-west, Fulton Street will connect four major public open spaces of the World Trade Center site: the Wedge of Light Plaza, Hub Plaza, September 11th Place and Washington Place. These four spaces will serve as the gateway to the site for many visitors, starting with the Wedge of Light Plaza. They will also serve as a key link in the procession of public spaces along Fulton Street that includes St. Paul's chapel and cemetery, and the World Financial Center Winter Garden.

The Memorial bounded by Greenwich Street, Liberty Street, West Street (9A), Fulton Street and September 11th Place, is the site reserved for "Reflecting Absence" by Michael Arad and Peter Walker, the World Trade Center Site Memorial, described in Section 4.1.



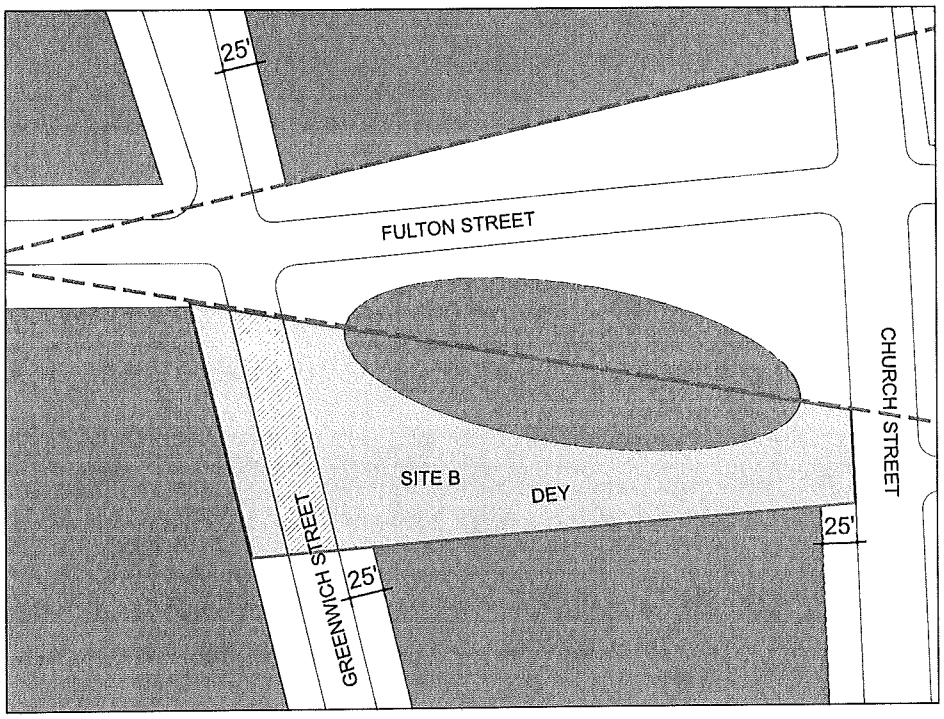


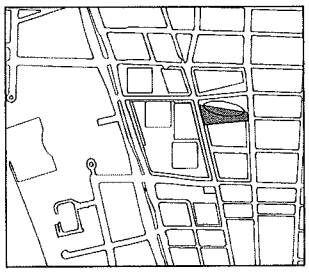
Site Boundary Line
Wedge of Light Guideline
Area to Remain Open
Street

Site A: The Wedge of Light Plaza

The Wedge of Light Plaza should be designed as a civic plaza bustling with the energy of the thousands of citizens and visitors whose paths will cross it each day – moving between the WTC Transportation Hub, ferries on the Hudson, subways, places of work and commerce, shopping and entertainment, the Memorial, the museum, cultural facilities and hotels in the area. It should be able to accommodate spontaneous and programmed activities, changing its character throughout the day, week and year. It should be the place to meet, gather for public events or outdoor concerts, or take a break from daily routines. The geometry of the Wedge of Light Plaza is defined by the location of the sun on September 11th – organizing the place around the solar angles on September 11th from 8:46 am, when the first plane struck, until 10:28 am when the second tower collapsed. It will become a lasting reminder of the event in 2001 that took so many lives. It is defined by the street walls of Tower 2 on the north and the WTC Transportation Hub on the south. As seen in the diagram above, the configuration will be widest at Church Street and will narrow as it meets Greenwich Street Right of Way. This form will invite pedestrians into the memorial precinct and area around the Freedom Tower, while focusing attention on September 11th Place at the intersection of Greenwich and Fulton Street. Emergency access and service access shall be provided to reach building including the Memorial.

The Wedge of Light boundaries are defined as:
North boundary – a solar azimuth of 285° 57′ 30″ from a point beginning at the top of the center of the southerly dome of the park row building at 15 Park Row having a coordinate of N 198,419.057 feet, E 982,032.033 feet and an elevation of 727 feet, offset a distance of 17.725 feet to the southerly side.
South boundary – a solar azimuth of 308° 27′ 03″ from a point beginning at the southwesterly corner of the AT&T building on Dey having a coordinate of N 198,282.677 feet, E 981,366.585 feet and an elevation of 697 feet. The point of convergence of the azimuths has a coordinate of N 198,764.394 feet, E 980,759.914 feet. The coordinates of the points of beginning and convergence are in the North American Datum of 1983-96, Long Island Zone (feet). Elevations are in WTC-Downtown Redevelopment Program Datum where elevation 300.000 feet is equal to 2.653 feet above the National Geodetic Datum of 1929 as established by the National Ocean Survey.

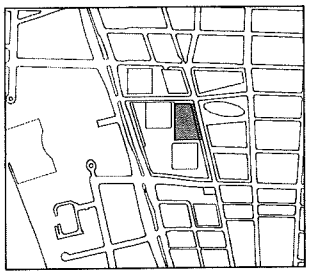


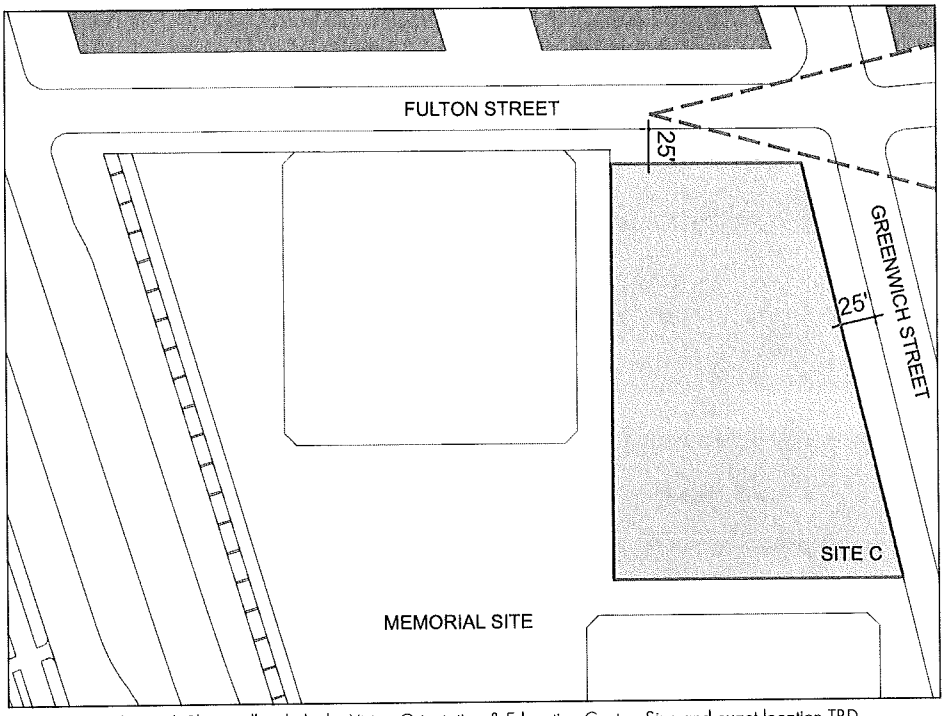


Site Boundary Line
Wedge of Light Guideline
Area to Remain Open
Street

Site B: HUB Plaza

Hub Plaza, with the Wedge of Light Plaza, will complete the open plaza surrounding the WTC Transportation Hub. The plaza is situated between the southern edge of the WTC Transportation Hub and the northern edge of Tower 3. It could also serve as a more formal outdoor event space for public gatherings and performances. It is an ideal setting for outdoor cafes and retail along the north face of Tower 3. Unlike the Wedge of Light Plaza which will be predominantly hardscape, Hub Plaza may incorporate plant material wherever appropriate. Dey will be reestablished as a pedestrian connection. Emergency access and service access shall be provided for each building including the Memorial. Dey will be incorporated into and be designed as part of the WTC Hub Plaza but must allow for emergency vehicle access as approved by CDOT and the FDNY.



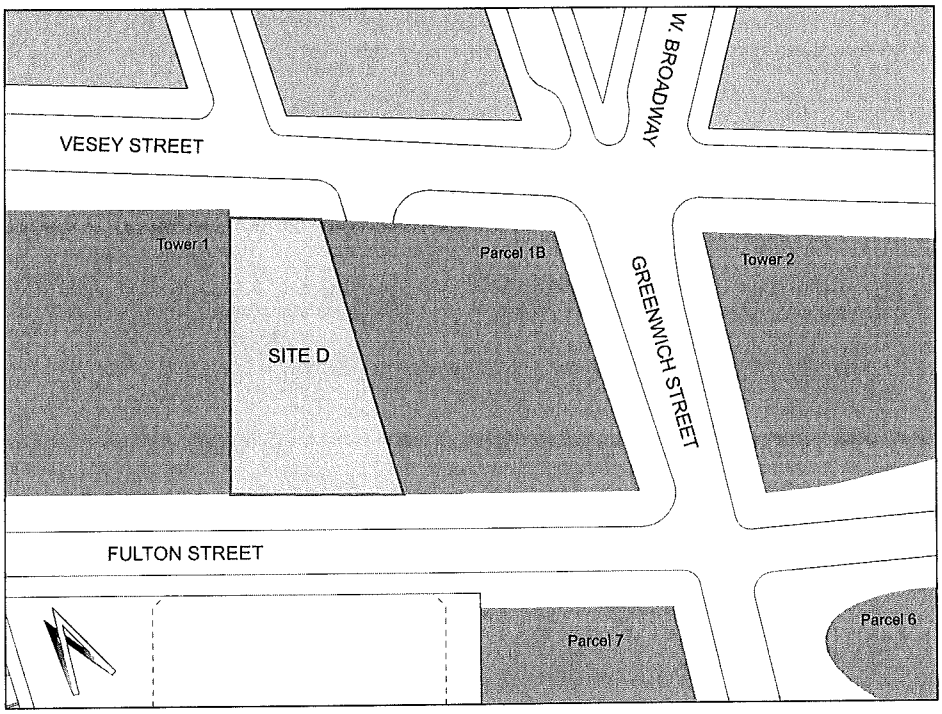


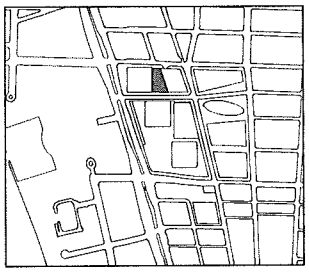
Site Boundary Line ——
Wedge of Light Guideline — —

Site C: September 11th Place will include the Visitor Orientation & Education Center; Size and exact location TBD.

Site C: September 11th Place

September 11th Place is an important open space that is west of Greenwich Street. The Visitor Orientation & Education Center will occupy part of this parcel in conjunction with the open plaza. Located at the cultural nexus of the site (Greenwich and Fulton Streets), the plaza will provide connections between the Performing Arts Center, the WTC Transportation Hub, Hub Plaza, and the Memorial, while providing a setting for the Visitor Orientation & Education Center. The Visitor Orientation & Education Center on Parcel 7 will invite pedestrians for a view of the Memorial from a point between the two original World Trade Center Tower Footprints. Designs for the Visitor Orientation & Education Center should stress physical permeability and visual transparency through the site. September 11th Place will act as a transitional space balancing the active public streets and open spaces with the contemplative nature of the Memorial and will provide queuing and orientation for the thousands of visitors to the site. Emergency access and service access shall be provided.





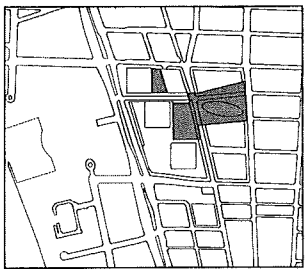
Site Boundary Line

Area to Remain Open

Site D: Washington Place

Washington Place, bordered by Tower 1, Vesey Street, the Performing Arts Center and Fulton Street, will serve as an entry point to the World Trade Center site from the north. It will be a continuation of the linked series of open spaces along Fulton Street, and will have activity throughout the day, channeling visitors into Tower 1 and the Performing Arts Center and to the Memorial. Washington Place will be a pedestrian, non-vehicular way able to accommodate outdoor activities and seating. The space should be predominantly hardscape, with trees, seating, plantings, lighting fixtures and water features. Programming for this space shall not impose any circulation or access impositions on Tower 1 or the Performing Arts Center. The geometry of this space is defined by the footprints of Tower 1 and the Performing Arts Center as well as the Vesey and Fulton Street sidewalks. Emergency access and service access shall be provided.

6.2.3 Uses and Activities



Although the Fulton corridor accommodates both pedestrians and vehicles, the design of the public open spaces should emphasize the pedestrian experience. The Wedge of Light Plaza and the Hub Plaza are the most flexible of all public spaces on the World Trade Center site, accommodating a full range of activities – from individuals simply seeking a respite from their offices, commuters traveling form one place to another, to large performances and civic gatherings.

Morning Rush

During the week, in the morning rush hour, the Wedge of Light and Hub Plaza will accommodate tens of thousands of workers exiting the WTC Transportation Hub and subway exits and fanning out into the surrounding area. Vehicles will drop off passengers along Church and Greenwich Streets. The space will be a welcoming gateway to Lower Manhattan.

September 11th Place will be relatively quiet during morning rush hour, as it prepares for the first visitors of the day to the cultural buildings and Memorial.

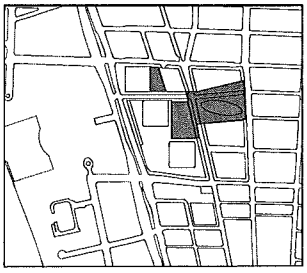
Washington Place will have workers passing through it on their way to Tower 1. The occasional early morning visitor to the Memorial may also arrive at the site from the north through Washington Place.

Noon Time

During the week Fulton Street and the Wedge of Light will be the center of activity. Movable chairs and tables may be located in the Hub Plaza allowing people to use the space to accommodate changing programs and sun patterns. Shade in the summer, and filtered sunlight through the trees in spring and fall will create a comfortable environment for outdoor lunch and gatherings. Shoppers finding their way from Tribeca and Fulton Street will browse along the shops on the north side of the Wedge of Light. Memorial visitors will pass through these open spaces on their way to the museum and Memorial, joining workers and residents in their daily activities.

September 11th Place will bustle with activity as visitors from all over the world get their first glimpses of the Memorial or begin their visits to the Visitor Orientation and Education Center.

During the lunch hour, Washington Place will be filled with visitors and workers.



Special Events

An appropriate space for civic gatherings is the Wedge of Light Plaza which can accommodate thousands. The space can be used for public gatherings, to celebrate great achievements, and to remember the events of September 11th. The area can also be used for dozens of everyday functions that require a public realm space that is centrally located.

Hub Plaza is considered the best place for public gatherings. As a complement to the Wedge of Light, Hub Plaza allows the possibility to have gatherings more frequently without disrupting traffic or pedestrian patterns through the Wedge of Light. Due to the grade change, it is possible to have an amphitheater step configuration to be used for formal gatherings or as seating and more informal gathering spaces everyday.

Performances

The gently sloping ground plane and large dimensions of the Wedge of Light Plaza and Hub Plaza will make them ideal spaces for small performances in the evening and on weekends. Similarly, the proximity of Washington Place to the Performing Arts Center makes it a possible location for performances spilling out from the building itself.

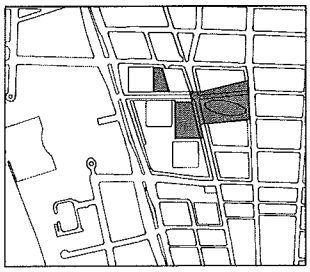
Demountable stages could be created to accommodate these events. Services for signage infrastructure, lighting, sound, and electricity should be provided in ways that allow for flexibility. If frequent use demands a permanent stage it should be designed as an element of urban furniture that can serve other purposes when not being used as a stage. The design of such spaces should also consider layouts for outdoor film or video screenings, collapsible staging, overhead lighting and seating riser systems. Potential indoor storage spaces for basic equipment setups should be identified for each public open space.

Smaller weekday performances should be accommodated with minimal disruption of pedestrian routes. More intimate or impromptu performance might occur in various spaces throughout the site.

The planning and design for the pubic open spaces along Fulton Street (the Wedge of Light Plaza, Hub Plaza, September 11th Place and Washington Place) should include locations for public art installations, both permanent and temporary. Services for site utilities (electrical, plumbing, drainage) should be designed to allow maximum flexibility for public art programming. In addition to site utilities, electrical service should also be provided to meet the needs of public art programming and outdoor performances, including lighting, sound and video at various locations within each assembly areas as well as "press box" sound system needs.

6.2.4 Hardscape, Furnishings and Lighting Guidelines

Hardscape



While Fulton Street will pass through the Wedge of Light Plaza, it should not feel like a street that divides the spaces. A continuous paving pattern, across plazas and roadway would help define the space as one place, and magnify its size. Similar materials could continue across Greenwich Street, making this intersection as the civic and cultural nexus. The paving materials and pattern are a significant design opportunity, and an opportunity for public art, marking the lines of light at 8:46 am and 10:28 am on September 11, and possibly introducing references to the many places from which those who lost their lives and their rescuers came.

Paving

Hard surfaces should predominate in the Wedge of Light Plaza, and Hub Plaza, to accommodate the heavy demands of pedestrians and vehicular traffic on the space. Dimensional stone/cut stone unit pavers should be used in the space, with a preference for natural stone materials. Overall, surface materials with a high albedo are preferred, with low albedo elements shaded in summer. Surface finish should provide suitable transaction in all weather conditions. Pavers should allow for drainage and the collection of runoff and for repairs to the deck membrane below. Paving around trees should also allow for adequate aeration and moisture to roots.

The pattern of paving will help provide a pedestrian scale to the space, and can introduce a narrative character that reinforces it as a destination. Paving patterns should be unique to this corridor rather than referencing existing or historic designs.

September 11th Place will be largely paved to accommodate heavy demands of visitors to the Visitor Orientation and Education Center and the Memorial. Paving should relate closely to the cultural buildings, Memorial, and the Wedge of Light Plaza to give the site a feeling of coherence and unity.

Washington Place will be paved to accommodate the numbers of people traveling through the space coming to and from Tower 1 and the Performing Arts Center. Dimensional stone/cut stone unit pavers should be used with the paving closely related to the adjoining buildings and Fulton Street.

Site Furnishings

Site furnishings should be designed using a unified palette to create a distinctive unified appearance across the World Trade Center site, and should also relate to the rest of Lower Manhattan. The Wedge of Light Plaza, Hub Plaza and Washington Pace should be furnished to support the patterns of everyday and special use – trees, seating, planting, lighting, waste receptacles, etc. However, they should be sited carefully to maintain the flexibility of the space and not impede pedestrian movement. Furniture and fixtures should be a contemporary feel. Metal should have simple finishes: painted or powder coated black and charcoal grey, or natural finishes for stainless steel. Seats should be wood from a sustainable source, metal, solid stone or concrete with an architectural finish. Adequate trash receptacles and bike racks should be provided at appropriate locations. Design standards for site furniture including bike racks, bollards, seating, etc. shall be established and used throughout the site to reinforce the continuity of the site.

Water features introduce a pleasant sound and aid in cooling the outdoor environment during the summer months. If water features are created they must be designed for all seasons, with and without flowing water. Water should be incorporated, so it does not disrupt the flow of people, and the flexibility of the space.

Ongoing maintenance of such furnishings is critical to the long term success of the project.

Lighting

The Fulton Street corridor should be evenly lit to encourage activity in the evening and night. Lighting in the Wedge of Light, September 11th Place, Washington Place and Hub Plaza should utilize a variety of approaches minimizing visual clutter. Placement of fixtures in the Wedge of Light should emphasize the breadth of the plaza, rather than paralleling the street with a single row of fixtures. The style and finish of metal fixtures should follow guidelines identified for site furnishings in the section above. Lighting for September 11th Place should be incorporated with the design of the Visitor Orientation and Education Center.

Minimum uniform outdoor lighting levels should be maintained throughout the site in accordance with the recommended standards of the illuminating Engineering Society of North America (IESNA) and the Sustainable Guidelines (see section 8).

Lighting and site furnishings may be designed to the standards set by the Alliance for Downtown New York where appropriate

Trees and plants are an important element of the overall design and can provide shade, wind protection, and a counterpoint to the built fabric. They are a barometer of the weather and seasons, and reaffirm life.

All plant species must be tolerant of New York City conditions – shade, drought, salt, air quality, wind and heavy traffic – and should be varied enough to avoid a monoculture. Maintenance is a significant consideration and specifications should be written and coordinated with the organization that will maintain the plants. Selection should provide seasonal interest with special consideration given to September 11th. Beds should contain a mix of perennials, groundcovers, ornamental grasses, low shrubs and annuals creating a "quiet" variety of texture and color. Planters, if raised, should remain low and encourage sitting and other activities.

The Wedge of Light Plaza

The Wedge of Light Plaza will be the crossroads of the site. Although primarily paved, lines of trees could be introduced to provide shade in hot summer months and give definition to spaces. They must be carefully located, to emphasize and preserve important views to the Freedom Tower, St Paul's Chapel and September 11th Place. The lines of light at 8:46 am and 10:28 am on September 11 should be maintained.

Tree placement and species selection should create the atmosphere of filtered light in the space, and should avoid obstructing visual connections to adjacent buildings. Medium to large deciduous shade trees with spreading form should be utilized. They should allow pedestrians to pass beneath and produce limited debris from seed, pods, fruit, etc. Evergreens should be avoided. Since the Wedge of Light Plaza is entirely over structure, soil depth will influence the location and type of trees selected. Depths are most limited at the western edge of the space, at its lowest elevation. Recommended tree species in the Wedge of Light Plaza can be found in the margin on the preceding page.

Recommended HUB Plaza and Wedge of Light Plaza Shade Trees

Ginkgo biloba – Gingko (male only)
Gleditsia triacanthos var inermis – Thornless Honeylocust
Platanus x acerifolia 'Bloodgood' – Bloodgood London Planetree
Plellodendron amurense – Amur Corktree
Sophora japonica – Japanese Scholar Tree
Zelkova serrata – Japanese Zelkova
Trees on the Asian Longhorned Beetle watch list are prohibited.

Recommended Ornamental Trees

Acer buergerianum – Trident Maple
Acer tartaricum – Tatarian Maple
Amelancheir canadensis - Shadblow Seviceberry
Cercis canadensis – Eastern Red Bud
Crataegus spp. – Thornless Hawthorn
Koelreutaria paniculata – Goldenrain Tree
Malus spp. – Flowering Crabapple
Syringa reticulata - Japanese Tree Lilac

Recommended tree species are selected from the following sources:
Battery Park City Parks Conservancy – Plant List
City of New York Parks and Recreation – Street Tree Planting Standards
Urban Horticulture Institute Cornell University – Recommended Urban Trees
Trees on the Asian Longhorned Beetle watch list are prohibited

(A) Wedge of Light Plaza
(B) HUB Plaza
(C) September 11th Place
(D) Light Fixture
(E) Street Furniture
(F) Washington Place

HUB Plaza

HUB Plaza will be a counterpoint to the Wedge of Light. Although primarily paved, a cluster of trees may be introduced to provide shade in hot summer months and give definition to the space. An amphitheater may be developed as an element of urban furniture that invites regular use. Dey will be incorporated into and be designed as part of the adjacent WTC Hub Plaza but must allow for emergency vehicle access as approved by CDOT and the FDNY.

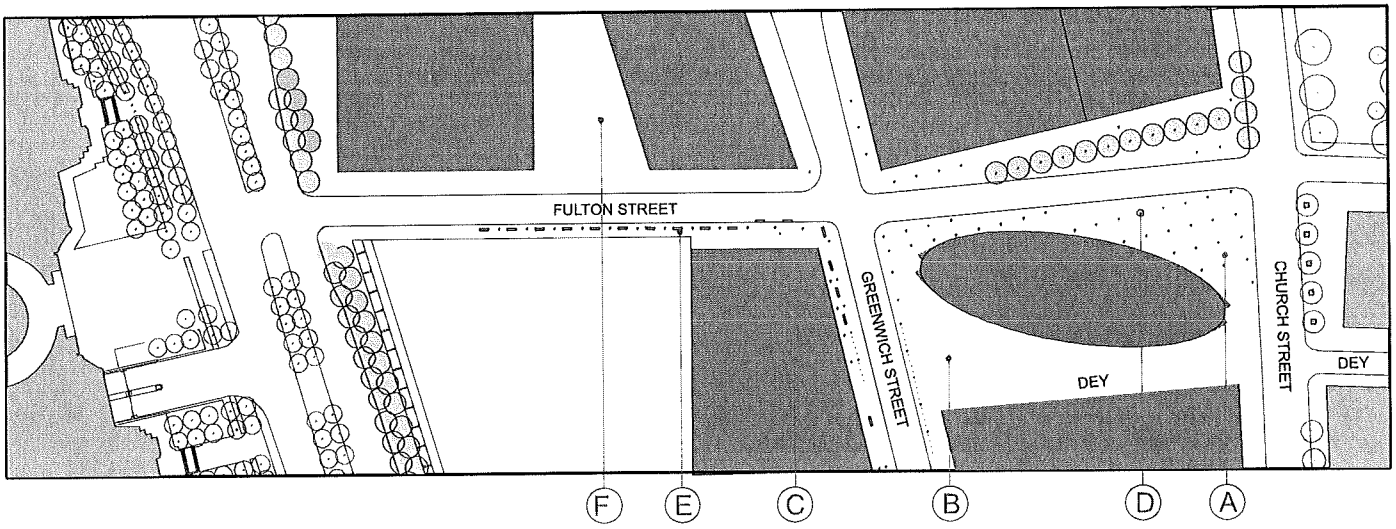
September 11th Place

The Visitor Orientation and Education Center will partially occupy this plaza. It will be a heavily used space and should be mostly hardscaped. Where plant material is incorporated, it should be coordinated with the landscape treatment of the Memorial and provide an appropriate setting for the Visitor Orientation and Education Center

September 11th Place should provide a visual connection to the Memorial from the intersection of Fulton and Greenwich.

Washington Place

Washington Place will be primarily hardscape with some trees and plantings to provide shade and greenery. The selection of such landscape materials should be coordinated with the adjacent streets, sidewalks and interior spaces at-grade.



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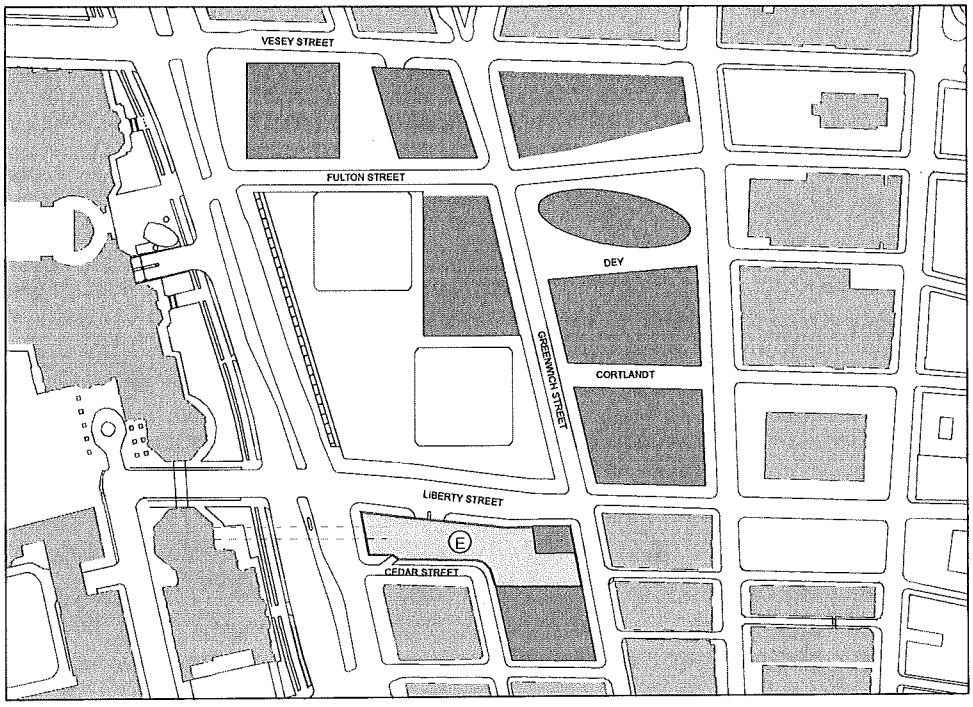
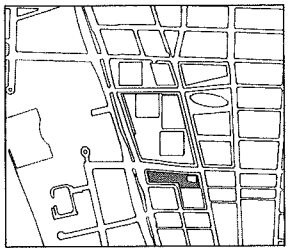




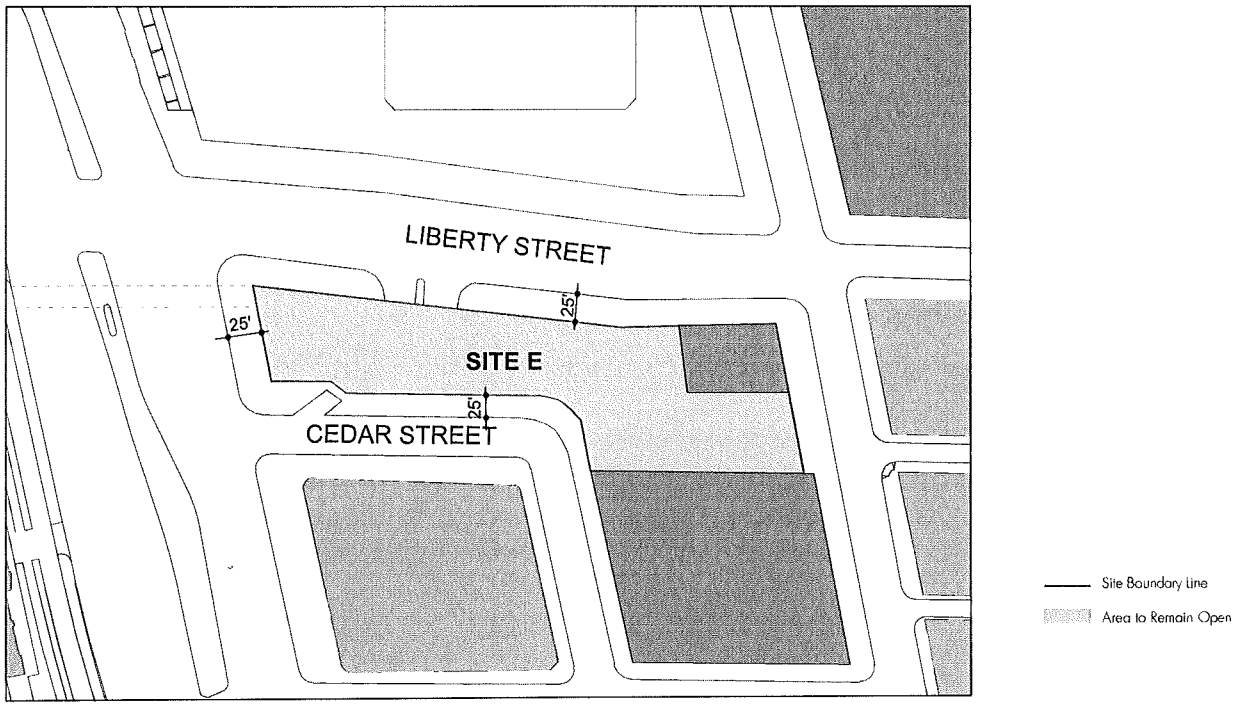
Site Boundary Line
Area to Remain Open
Pedestrian Bridge

Deconstruction of the 130 Liberty Street building, damaged by the events of September 11th, will create the opportunity for a new park for Lower Manhattan. This site is slightly larger than Bowling Green Park and should be designed to serve the workers and growing number of residents in the surrounding area. At midday, its users will be mainly employees of surrounding buildings and visitors, while in the evening and on weekends, visitors and residents will be the primary visitors. The park will also have a complementary relationship to the rebuilt St. Nicholas Church and other uses on Parcel 8.

The planning and design for the public open spaces at Liberty Park should include locations for possible public art installations, both permanent and temporary. Services for site utilities (electrical, plumbing, drainage) should be designed to allow maximum flexibility for public art and public event programming.

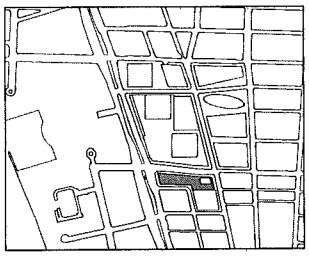
The design, construction and operation of the portion of Liberty Park in the area generally north of Parcel 5 will be consistent with the Commercial Office Developer's anticipated design, construction and operation of Parcel 5 (including the location of one of the entrances to Parcel 5 on the north side of the tower across from Liberty Park) and will conform to the reasonable requirements of the Commercial Office Developer in connection with Parcel 5, including reasonable requirements for vehicle and pedestrian access, circulation and other matters. If Parcel 5 is not developed as commercial office tower, the portion of Liberty Park adjacent to Parcel 5 should be designed, constructed, and operated in conformance with the requirements of its alternative use. If, for example, Tower 5 is developed as a residential tower, Liberty Park should reflect and respond to its location as a forecourt to a residential address.

Liberty Park will be an important new open space in Lower Manhattan. The design and operation of the park must respond in creative ways to challenges posed by its location and configuration, proximity to West Street, and unique site constraints. The park must be an inviting place for people while accommodating entry ramps for the WTC Vehicular Security Center, the landing for a pedestrian bridge over Route 9A, venting required by the underground parking garage, and the reconstruction of St. Nicholas Church. An innovative and evocative design response is required.



Site E (Liberty Park) is formed on its north edge by Liberty Street and its south edge by Cedar Street and Tower 5. The southern edge of the Memorial will be located directly across Liberty Street. The ramps providing access for trucks, busses and cars entering the WTC sub-grade network will be located in the western half of Liberty Park. As the entrances to these ramps require some structure above-grade, the design of the park must be coordinated with the ramp entries. Underground structures will be located directly beneath most of this site. Emergency access and service access shall be provided for each building including the Memorial.

6.3.3 Uses and Activities



Morning Rush

In the morning rush hour, residents of Battery Park City and commuters will walk along West Street, Liberty Street or Liberty Park on their way to work. In pleasant weather, they may also take this route to subways on Greenwich or Church Streets or to the WTC Transportation Hub. Other commuters arriving by mass transit may walk through these spaces on their way to the World Financial Center. A few tourists getting an early start may begin their visits at the Memorial and gather along the edge of Liberty Park.

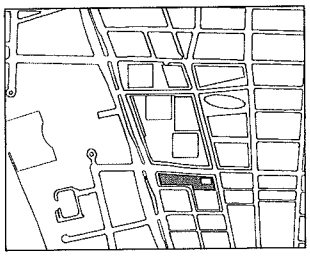
Midday

The green space of Liberty Park will be a welcome retreat for workers of the surrounding area who will come to the park to meet, eat lunch, chat or simply enjoy the respite of a large green space in Lower Manhattan. Some visitors may be drawn to the western edge of the site to view the Memorial, while others may prefer simply to watch activity of people passing by at the busy intersection of Greenwich and Liberty Streets.

Evenings and Weekends

In the evening, workers and residents may stroll through the park as they wind down from a busy day and wander towards the waterfront. On weekends visitors will picnic, read, or play with their children. During the warmer months, the park may also be a spot for sunbathers and children enjoying the outdoors.

6.3.4 Hardscape, Furnishings and Lighting Guidelines



Sidewalks should be provided on edges of the site, following the guidelines outlined in the streetscape section [6.4]. The edges should remain open and inviting to park users, maintaining a visual connection between the park space and surrounding streets and buildings. Within the park paving materials should relate to the materials used in other open spaces around the site. Dimensional stone/cut stone unit pavers should be used, with a preference for natural stone materials. Overall, surface materials with a high albedo are preferred, with low albedo elements shaded in summer. Surface finish should provide suitable traction in all weather conditions. Pavers should allow for drainage and the collection of runoff and for repairs to the deck membrane below. Paving around trees should also allow for adequate aeration and moisture to roots.

The pattern of paving will help provide a pedestrian scale to the space, and can introduce a narrative character that reinforces it as a destination. Paving patterns should be unique to this park and the rest of the WTC site rather than referencing existing or historic designs.

Plant material should be incorporated wherever possible. Careful study of the sun and shadow patterns of surrounding towers will give insight into which areas should be open or shaded, paved or green. Large raised areas for planting should be kept low, 24" or less, to maintain a visual and physical connection to surrounding areas. These areas might be surrounded by continuous steps allowing opportunities for seating. Smaller raised areas might be surrounded by low seating walls. The sides of the elevated portion of the park should be welcoming to passers-by, with possible stairs or ramps down to grade.

Liberty Park could be organized using the Heroes' Matrix as a guiding principle (see section 6.7). Site furnishings should be designed using a unified palette to create a distinctive unified appearance across the World Trade Center site, and should also relate to the rest of Lower Manhattan. The park should be furnished to support the patterns of everyday and special use – trees, seating, planting, lighting, waste receptacles, etc. However, they should be sited carefully to maintain the flexibility of the space and not impede pedestrian movement. Furniture and fixtures should have a contemporary feel. Metal should have simple finishes: painted or powder coated black and charcoal grey, or natural finishes for stainless steel. Seats should be wood from a sustainable source, metal, solid stone or concrete with an architectural finish. Adequate trash receptacles and bike racks should be provided at appropriate locations. Design standards for site furniture including bike racks, bollards, seating, etc. shall be established and used throughout the site to reinforce the continuity of the site.

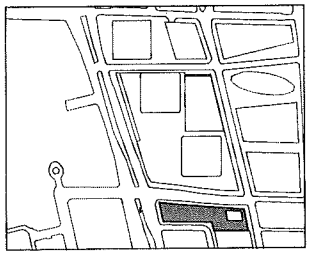
Water features introduce a pleasant sound and aid in cooling the outdoor environment during the summer months. If water features are created they must be designed for all seasons, with and without flowing water. Water should be incorporated, so it does not disrupt the flow of people, and the flexibility of the space.

Ongoing maintenance of such furnishings is critical to the long term success of the project. Movable tables and chairs should provide additional seating and allow users to shape the space. The addition of water features will provide a pleasant background noise. Fountains that children can play in would be a great amenity to surrounding neighbors and add life to the site during quiet hours.

The park should be well lit at its edges, with area lighting within. To ensure continuity lighting at the edges should match the fixtures used elsewhere on the World Trade Center site. Within the park, lighting should be distributed to encourage activity in the evening and night.

Minimum uniform outdoor lighting levels should be maintained throughout the site in accordance with the recommended standards of the illuminating Engineering Society of North America (IESNA), and the Sustainable Guidelines (see section 8).

6.3.5 Landscape Material Guidelines



Recommended Liberty Park Ornamental Trees

Betula nigra – River Birch
Celtis laevigata – Sugar Hackberry
Cladrastis kentuckea – Yellowwood
Liquidambar stryraciflua – American Sweetgum
Liriodendron tulipifera – Tuliptree
Nyssa sylvatica – Black Tupelo
Taxodium distichum – Common Baldcypress

Trees selected from the following sources:
Battery Park City Parks Conservancy – Plant List
City of New York Parks and Recreation
– Street Tree Planting Standards
Urban Horticulture Institute Cornell University
– Recommended Urban Trees
Trees on the Asian Longhorned Beetle watch list are prohibited.

Liberty Park is the largest civic park space of the World Trade Center site and provides the greatest opportunity for planting. Paths of travel should be maintained as paved areas, with plant material introduced wherever possible. Areas of lawn should be provided to accommodate multiple activities, surrounded by planting beds for seasonal interest including the winter season. Visibility should be maintained to the surrounding streets. Plants should be tolerant of the urban conditions and the limited soil depths that are present in most of the site. Placement of trees and other plant materials should take into consideration the sun and shadow patterns, wind conditions and outdoor environmental comfort created by surrounding buildings.

In addition to the tree species identified for the Fulton Street corridor (described in section 6.2.5) and streetscapes (described in section 6.4.3), other tree species are possible, including those noted in margin left. In consideration of the sustainable design guidelines and in addition to the ornamental trees listed here, designers should consider native species for planting.

Among the guiding principles of the master plan are the re-connection of the World Trade Center site with the rest of Lower Manhattan and the celebration of the vitality of New York through the creation of interesting and dynamic streetscapes and public open spaces. Since the site is located between the older, dense fabric of the financial district and the newer, spacious fabric of the World Financial Center and Battery Park City, the streetscapes of the World Trade Center can provide the best of both worlds: generous sidewalks with trees and furniture that are well-defined by significant buildings programmed with active, street level uses.

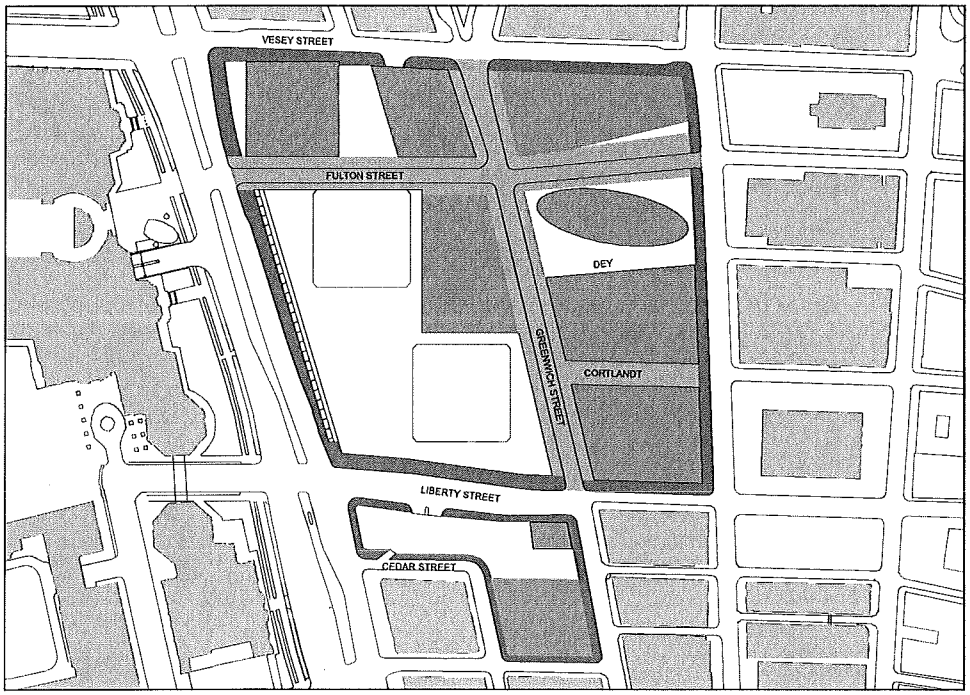
It is important to define, through all the public open spaces, the World Trade Center site as something special and unique. It must, however, at the same time stitch itself back into the urban fabric of Lower Manhattan and New York City. Streetscapes provide the opportunity to define the boundaries and character of the site.

Around the perimeter of the site, where the new development faces typical city streets, along Vesey Street, Liberty Street, Church Street, Cedar Street and to some extent West Street, the streets should be planned as tree-lined streets complementing the planting at existing streets. These conditions will be referred to as "typical streetscape."

Within the site, along Fulton Street and Greenwich Street, the streetscape is conceived of as unique urban streets defined by lighting and street furniture. The unique streetscape along Fulton and Greenwich must serve the active life of city streets. Where adjacent to the Memorial, these streets must also complement the Memorial establishing an edge where the Memorial and the city streets meet. Designers may look to the Memorial for inspiration. This interpretation allows the public space to be clearly defined as a whole, united space rather than disparate elements.

Streets provide a place for the 24 hour public life of Lower Manhattan. The design of the streetscape should be guided by a number of objectives:

- Reconnect the World Trade Center Site with the street grid of Lower Manhattan.
- Employ a unified palette of landscaping, paving, lighting and Furnishings to create a distinctive appearance across the World Trade Center site, but one that relates to the existing streetscape of Lower Manhattan.
- Introduce street trees to create green edges, where appropriate.
- Create street edges which are soft both visually and physically porous, while respecting security needs.
- Frame significant urban vistas through the thoughtful orientation of streets, buildings and landscape elements.
- Develop a strategy that meets the criteria for security, but does not impede the movement of pedestrians and visual continuity of street trees, lighting and furnishings.
- Work with the New York State Department of Transportation to coordinate streetscape efforts with those of West Street (Route 9A).



Unique Streetscapes

Typical Streetscapes

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Paving and Curbing

Materials for sidewalks and curbs should be durable, dignified and detailed in a manner consistent with the buildings of the World Trade Center site. For this reason, granite curbs and stone pavers (regional types are encouraged) should be used throughout the site. Patterns and materials should be carefully coordinated with characteristics for paving in other public open spaces such as the Wedge of Light or September 11th Place. In heavy pedestrian traffic areas, pavers should provide suitable walking surfaces, and should be ADA compliant. Contemporary forms and patterns should be used. "Typical streetscapes" should coordinate designs and material selections to fit in with the streets and sidewalks of Lower Manhattan while "unique streetscapes" should be treated as a site specific precinct with its own unique design and palette of materials that is compatible with typical streetscape. The precise locations and boundaries of typical and unique streetscapes have not yet been established but should be compatible with the architectural features of the various project elements.

Within the selected paving and curb materials, there is a desire to create hospitable conditions for street trees such as those listed earlier in Section 6. For such street trees, the use of structural soils shall be employed wherever possible.

Lighting and Furnishings

Street lighting and furnishings are important to providing a comfortable, usable environment for pedestrians, and introduce a scale that mediates between humans and tall structures. As with hardscape materials, lighting and furnishings on the site should be durable, dignified and detailed in a manner consistent with the buildings of the World Trade Center site. Lighting should be designed with a unified palette to create a distinctive unified appearance across the World Trade Center site and should also relate to the rest of Lower Manhattan.

The streetscape proposals prepared in 1999 by the Alliance for Downtown New York address the issue of reconciling security with human needs. Since the events of September 11, security has become a dominant issue. Studies were completed for the World Financial Center and Wall Street district that respond to this concern. Because of the significance of the World Trade Center site, and the desire to create a collective identity, a different family of lighting and furnishings is required. However, concepts of the Downtown Alliance streetscape proposals remain valid: "... a unified look, contemporary in style, yet familiar in feeling."

Intersections and Crosswalks

Providing a safe and interesting experience at intersections is vital to encouraging pedestrians to travel at street level. The 1997 Lower Manhattan Pedestrian Study prepared by the Department of City Planning and Department of Transportation recommends, among other actions, widened crosswalks, high-visibility crosswalks, "Barnes Dance" crosswalks, stop lines, early pedestrian walk signals, and coordinating the signal timing. Each of these proposals should be considered for intersection crosswalks on the World Trade Center site. The intersection of Greenwich and Fulton, the cultural nexus of the site, requires special attention. This intersection, part of the sequence of linked open spaces along Fulton, could have continuous paving across entire intersection, with stop lines clearly integrated into the pattern of pavers providing a clean and safe pedestrian environment. This approach may also be appropriate for pedestrian crossings at West Street where it intersects with Fulton and Liberty Streets, and must be coordinated with NYSDOT.

Proposed On-site Street Tree ○
Existing or Proposed Off-site Street Tree ○

Street Tree Placement

Street trees are to be planted along "typical streets." In areas where depth is limited, selected landscape architects and site designers will study soil depths (min. 4') and technical feasibility to determine if it is possible to create a continuous robust edge of street trees. Street trees should be planted according to a landscape strategy that reinforces the continuity of the site as well as provides pedestrian shade and scale to the greatest extent possible. The zone established for trees should also be used to organize other street elements such as light poles, hydrants, bollards, etc. Consistent with recommendations of the New York Parks Department, the maximum spacing for trees is 25 ft, although final spacing should be adjusted according to tree species and coordinated with other elements such as lights, furnishings, and the location of building lobbies and transit entrances. Except where streets are integrated into open spaces, tree rows should be aligned parallel to the curb, and set back an adequate distance to accommodate growth, root spread, and protect branches from traffic, but not restrict pedestrian movement on sidewalks.

The continuity of trees and their spacing lends legibility and continuity to streetscapes. For this reason, the regular spacing of street trees should be preserved as much as possible.

Recommended Street Trees

Acer pseudoplatanus – Sycamore Maple
Acer saccharum – Sugar Maple
Cercidiphyllum japonicum – Katsuratree
Gingkgo biloba – Gingko (male only)
Gleditsia triacanthos var. inermis
– Thornless Honey Locust
Gymnocladdus dioicus
– Kentucky Coffetree (male only)
Phellodendron amurense – Amur Corktree
Quercus acutissima – Sawtooth Oak
Quercus phellos – Willow Oak
Quercus rubra – Red Oak
Sophora japonica – Japanese Scholar Tree
Tilia cordata 'Greenspire'
– 'Greenspire' Littleleaf Linden
Tilia euchlora – Crimean Linden
Tilia tomentosa – Silver Linden
Ulmus japonica – Japanese Elm
Zelkova serrata – Japanese Zelkova

Tree species recommendation selected from the following sources:
Battery Park City Parks Conservancy
– Plant List
City of New York Parks and Recreation
– Street Tree Planting Standards
Cornell University - Urban Horticulture Institute Recommend Urban Trees
Trees on the Asian Longhorned Beetle watch list are prohibited.

Raised planters should also be avoided along streets, as they are an impediment to flexible pedestrian movement and compromise the health of street trees.

All plant species must be tolerant of urban conditions – shade, drought, salt, air quality, and heavy traffic. Materials should provide year-round interest marking the change of the seasons.

On West Street a dense overhead canopy will help define this as a connected greenspace rather than a thin margin of West Street. IF planting beds are provided they should be raised to avoid damage by the high volume of visitors along this edge.

Street Tree Species Selection

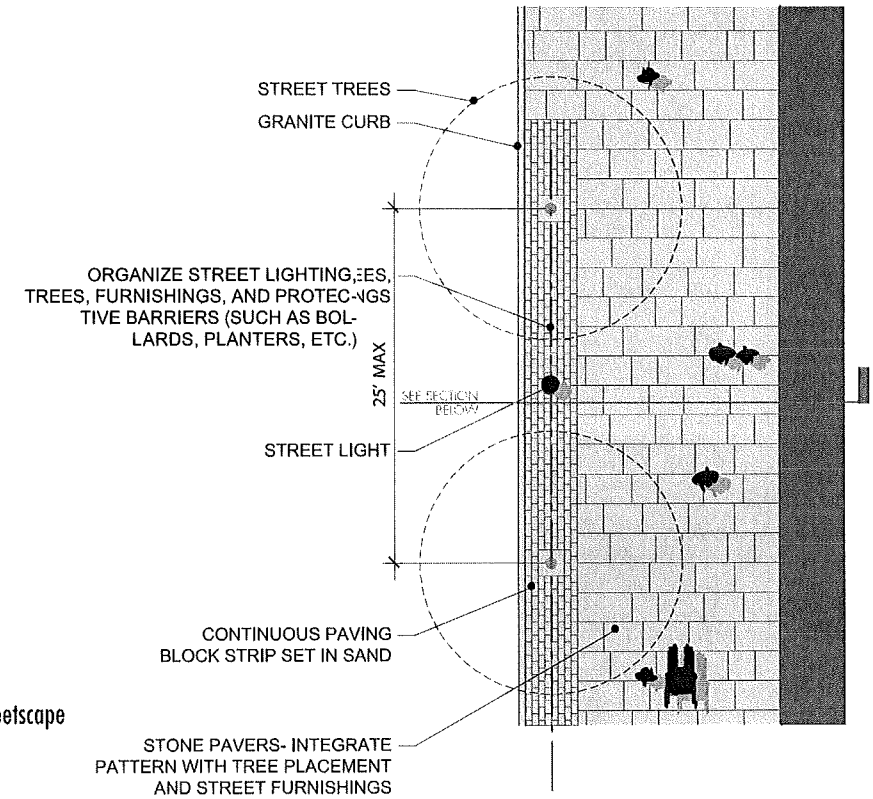
Proper species selection for trees is critical to their survival in the urban environment. Solar aspect, wind exposure, soil depth and size at maturity are some of the important considerations of tree selection. To avoid creating a monoculture, tree species should be varied. One solution is to use consistent species along each street, while varying the species from street to street.

Soil Depth

Healthy urban street trees require a soil culture conducive to root propagation. This is best achieved not with small, deep pits traditionally used in urban settings, but with wide, relatively shallow mats of special soil mixes designed to meet urban compaction requirements. A minimum 4 ft soil depth should be used, and the soil mat should extend beyond the planting area of the tree into surrounding areas, allowing roots to spread. The area above the soil mat must have a permeable surface, especially where soil depth is minimal.

With its extensive sub-grade network of concourses, retail, ramping, and truck security, not to mention subway infrastructure, the site presents limited soil depth along some streets. This will be a limiting factor in the greening of the site.

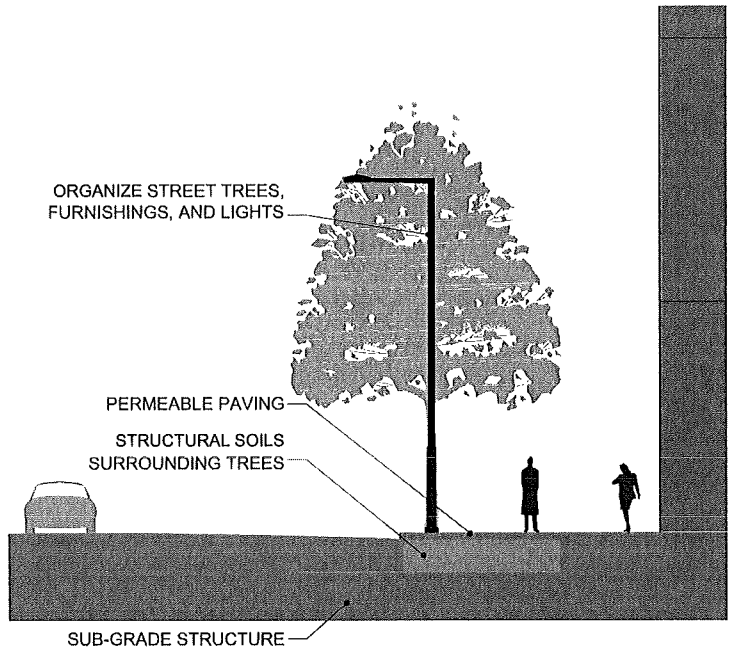
Typical Streetscape Integration 6.4.4



Typical Streetscape

SECURITY REQUIREMENTS

SECURITY DEVICES INSTALLED ON THE WORLD TRADE CENTER SITE SHOULD BE INTEGRATED WITH THE DESIGN OF PUBLIC OPEN SPACE AND STREETSCAPE ELEMENTS WHILE REMAINING CONSISTENT WITH SECURITY CRITERIA. SEE SECTION 6.6 FOR FURTHER SECURITY REQUIREMENT GUIDELINES.



Typical Streetscape

These diagrams are illustrative of a typical streetscape.

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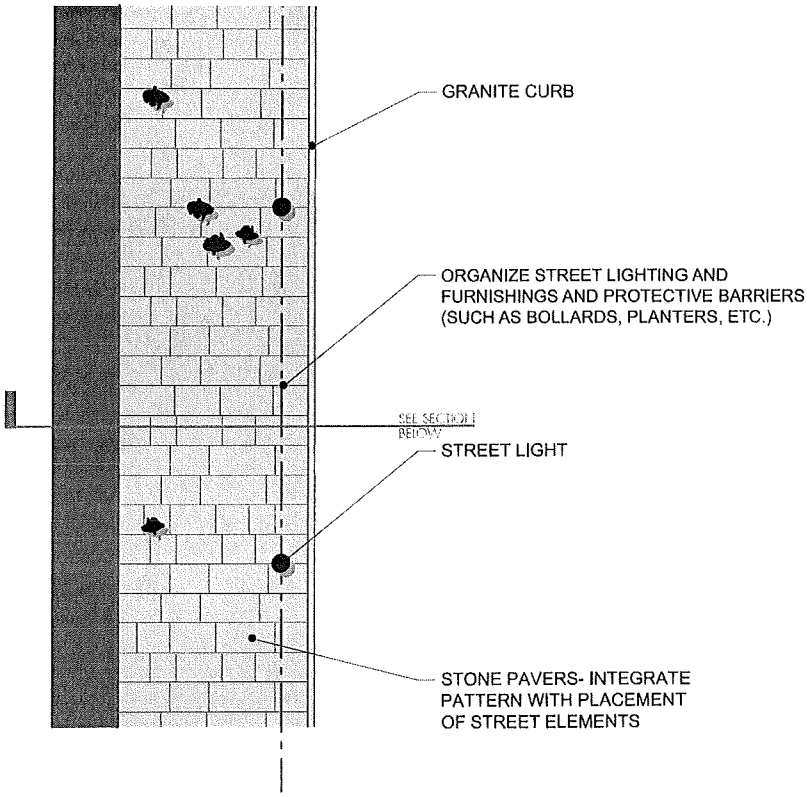
Unique Streetscape Integration



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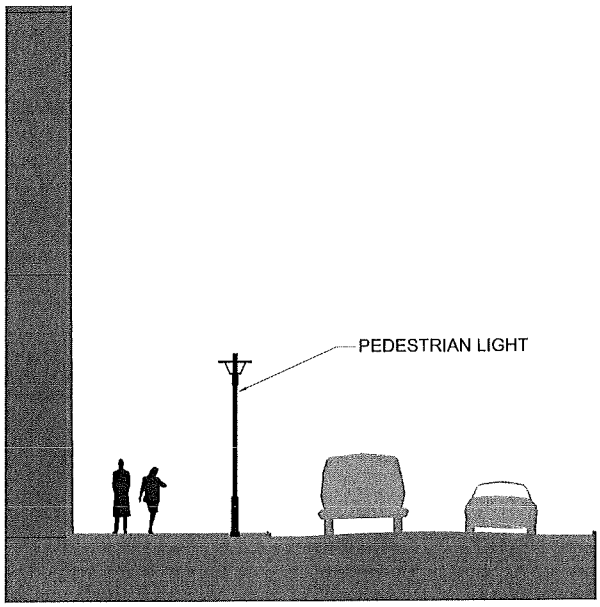
Unique Streetscape



Unique Streetscape

These diagrams are illustrative of a unique streetscape.

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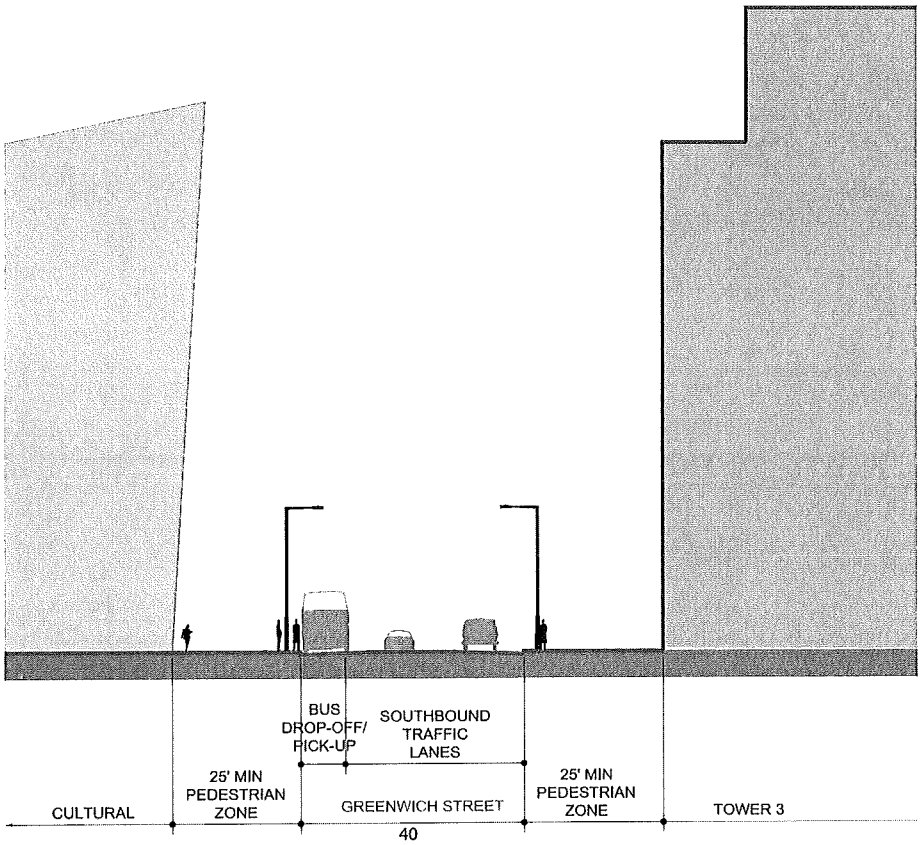
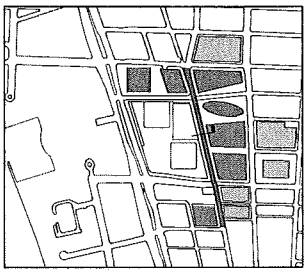
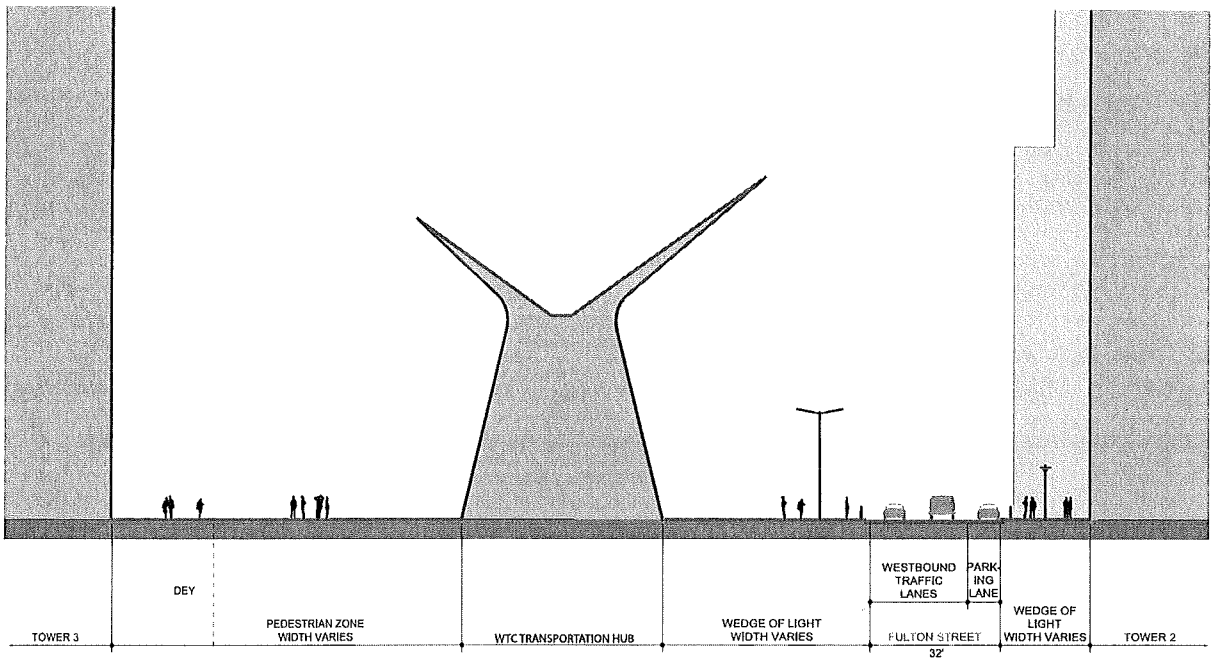


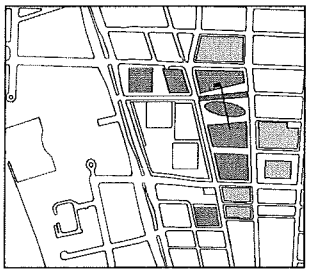


Greenwich Street - Unique Streetscape 6.4.5.1

Greenwich Street will bustle with pedestrian activity as both New Yorkers and visitors will stroll this street shopping, traveling to work, or visiting the Memorial and other tourist destinations like the Statue of Liberty. Tour buses visiting the Memorial may drop off and pick up on the west curb. Selected landscape architects and site designers will study soil depths (min. 4') and technical feasibility to determine if it is possible to create a continuous, robust edge of street trees. Low planters may be used, with care taken to prevent restriction of the pedestrian zone. Street trees, paving and furnishings should be of a unified palette for the unique streetscape. Special paving can identify the intersection of Greenwich and Fulton as the cultural nexus of the site. Careful placement of furnishings at the intersections of Greenwich/Fulton and Greenwich/Cortlandt should keep these areas open, both visually and physically.



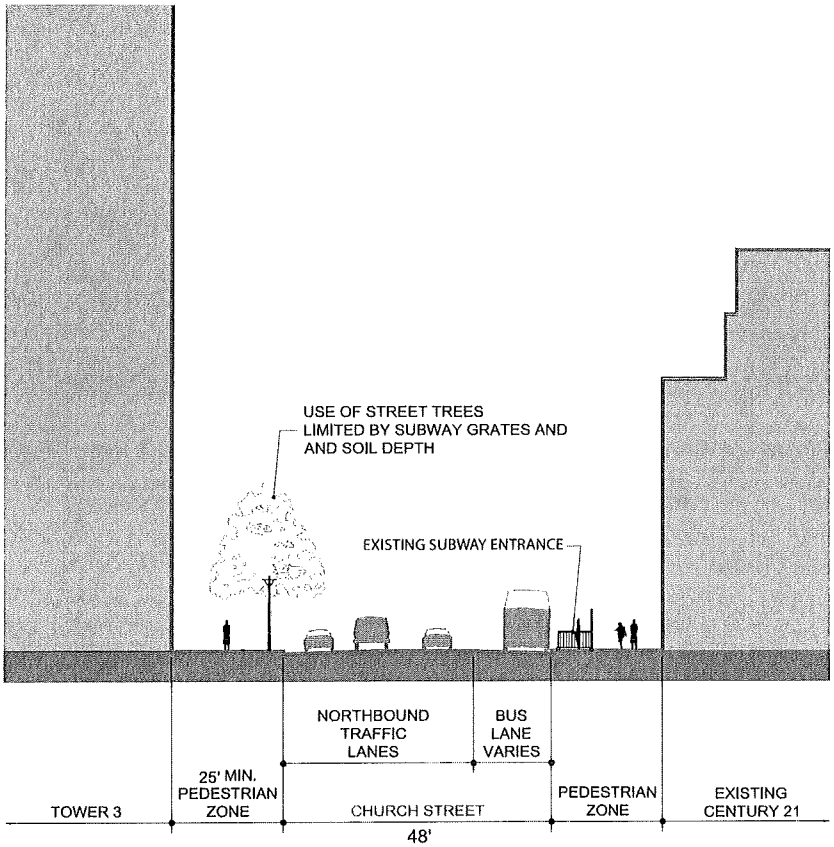
Section at Fulton Street

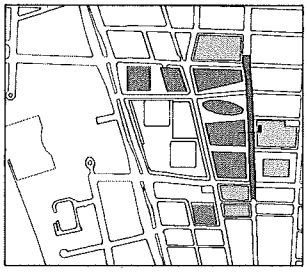


6.4.5.2 Fulton Street - Unique Streetscape

As Manhattan's first paved river-to-river street, and as an important corridor leading from the World Financial Center at the Hudson River to the historic South Street Seaport at the East River, Fulton is a critical East-West connection in Lower Manhattan. Like Greenwich, Fulton Street will bustle with pedestrian and vehicular activity. It must feel public and should provide easy access and amenities for pedestrians while accommodating both pedestrian and vehicular traffic. Forming the Northern boundary of the Memorial and passing between Tower 2 and the WTC Transportion HUB, Fulton Street is vital to the reintroduction of the street grid and reconnecting the site to the rest of Lower Manhattan. Fulton Street must be carefully considered and designed to balance its role as an important pedestrian and vehicular street, front door to the Freedom Tower and Performing Arts Center, and an integral part of the Wedge of Light, HUB, and September 11th Plazas.

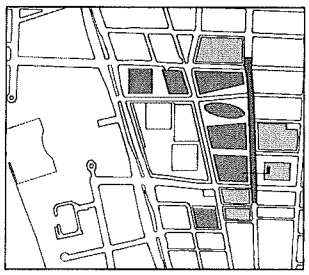
The streetscape of Fulton Street is of particular importance and is part of the unique streetscape palette. It will become an integral part of the Wedge of Light Plaza, HUB Plaza and September 11th Plaza (described in Section 6.2).

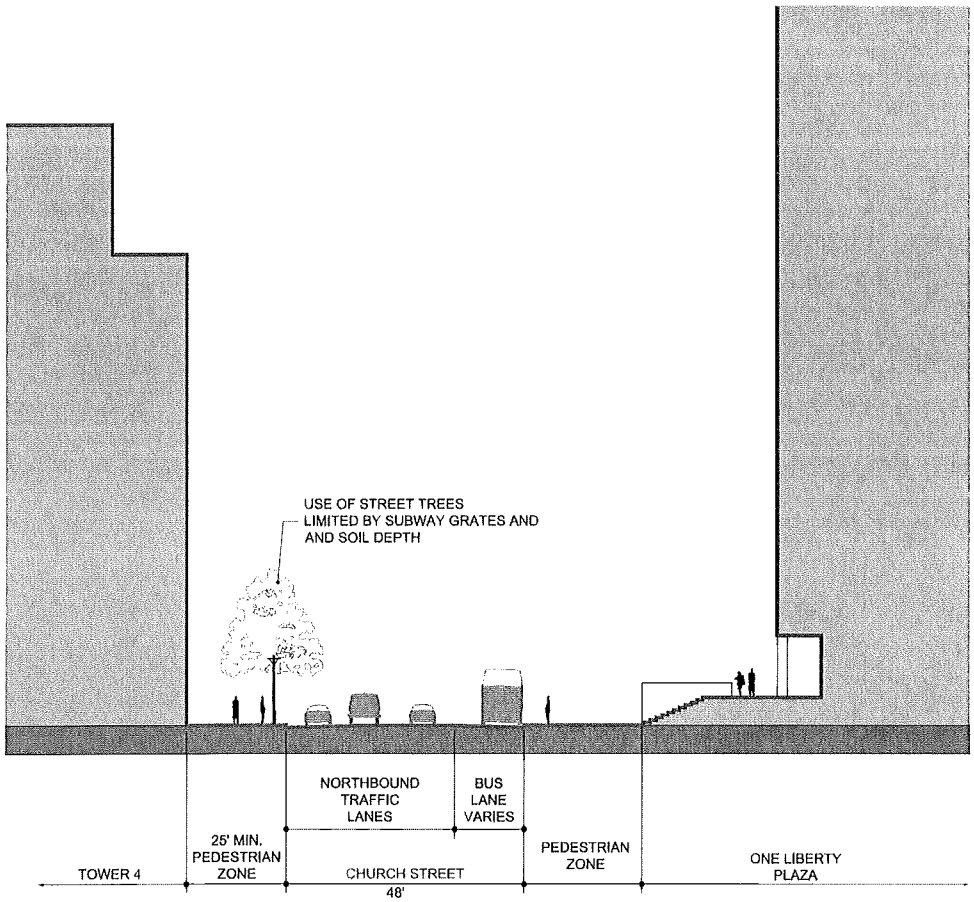




Church Street - Typical Streetscape 6.4.5.3

A major street for vehicular and pedestrian traffic, Church Street will be heavily used by commuters coming from the WTC Transportion HUB, bus stops and subway stations, as well as shoppers coming from the north and south. Numerous subway grates and subway stops will limit the locations of street trees. Pedestrian lighting and street furnishings will be critical in creating a human scale. It is recommended that the Wedge of Light Plaza paving continue to the west edge of Church Street, as an introduction and identification of the site to pedestrians. The character of the street should tie into the existing street conditions on the eastern edge. Trees should be planted where possible.





Section at Church Street

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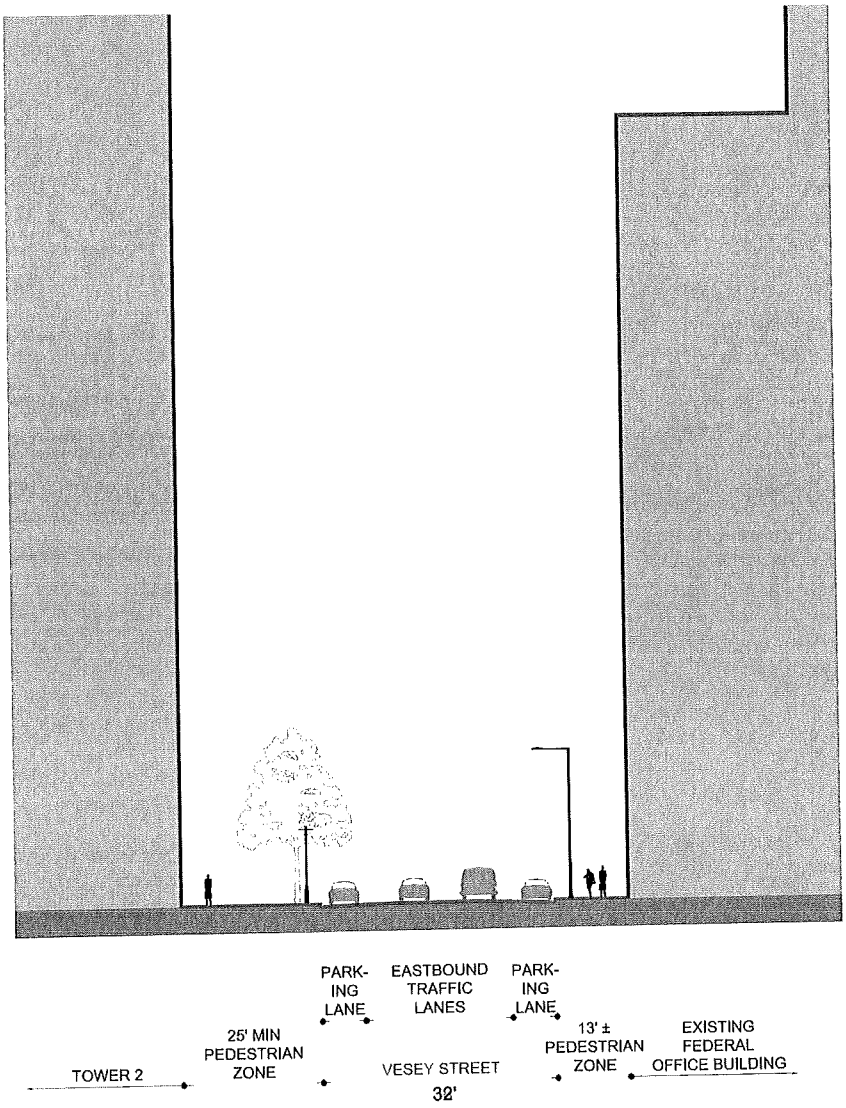
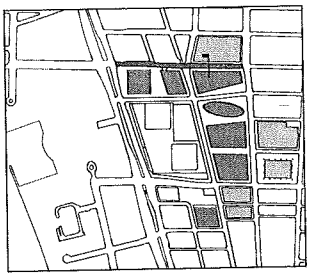
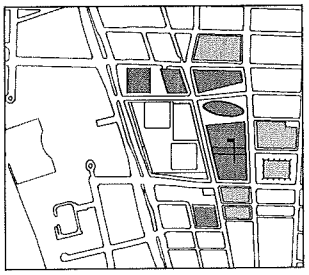




Vesey Street - Typical Streetscape 6.4.5.4

Vesey Street is an important east-west corridor, providing connections with the Brooklyn Bridge and Battery Park City. Street trees will play an important role in creating a pedestrian scale adjacent to the tall towers and developing a green connection between City Hall Park, St. Paul's Chapel, and Battery Park City. The character of the street should tie into the existing street conditions on the northern edge. Street trees should be planted wherever possible along the entire south curb of Vesey (the north sidewalk of the site). In time, the neighborhood north of the site should be encouraged to add trees to the sidewalk north of Vesey. The sidewalk along Vesey Street should be continuous with a "shovel" entry at the access to the car elevators in the Performing Arts Center.

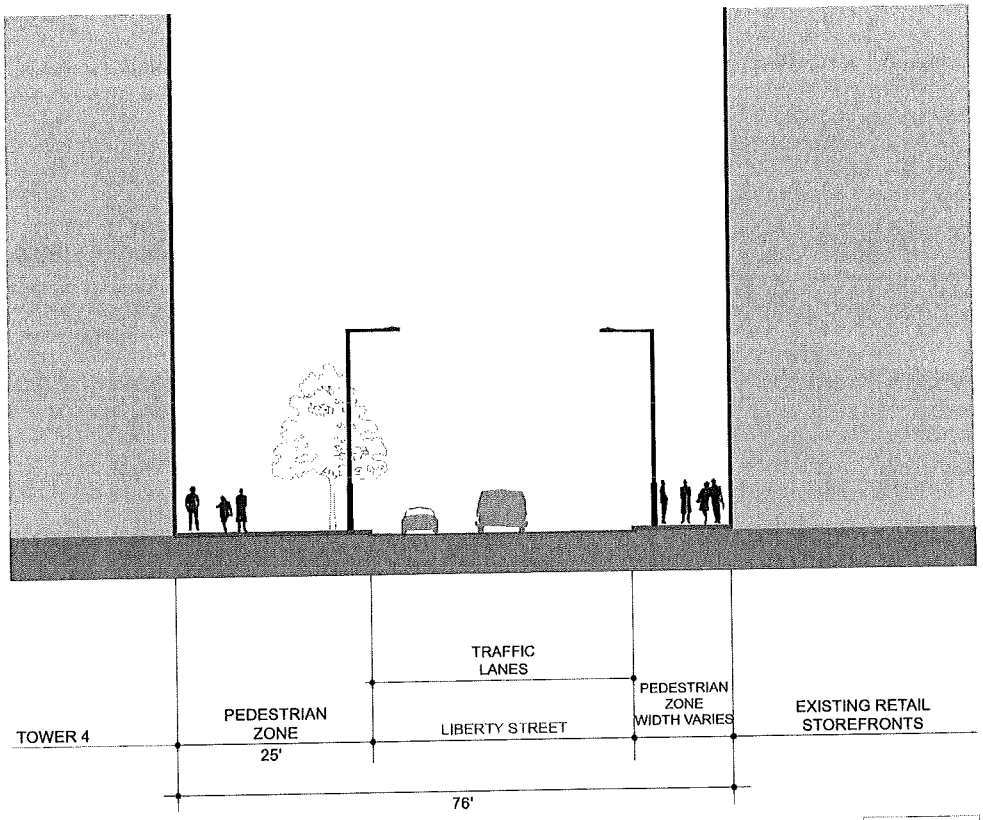


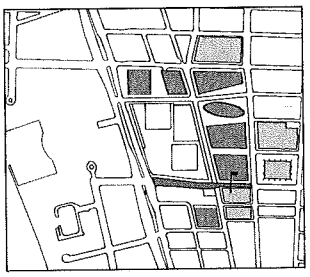
6.4.5.5 Dey - Typical Streetscape

Running east-west, Dey will be a major open, pedestrian connection located between the WTC Transportation Hub and Tower 3 to reconnect the World Trade Center site with the existing streets of Lower Manhattan. Running between Greenwich Street and Church Street, Dey will be a major link to the WTC Transportation Hub and an important east-west connection to and from the Memorial, September 11th Place and the center of the site. Dey will be incorporated into and be designed as part of the adjacent HUB Plaza but must allow for emergency vehicle access as approved by CDOT and the FDNY.

6.4.5.6 Cortlandt - Unique Streetscape

Cortlandt shall be an open, pedestrian connection running east-west between towers 3 and 4 that will be a minimum of 47' wide parcel to parcel. The height and proximity of the streetwall height and adjacent building massing will mean that special consideration should be given to ensuring the quality of the pedestrian experience. There shall be no bridges, elevated platforms or other galleria or roof structures between the towers. Cortlandt shall be constructed to standards that meet CDOT requirements including the ability for the roadway to carry emergency vehicles





Liberty Street -Typical Streetscape 6.4.5.7

Liberty Street will be another important east-west corridor for both vehicles and pedestrians. It will create an open space corridor, connecting Liberty Plaza, the Memorial, Liberty Park, public spaces at the World Financial Center and Battery Park City. The character of the Liberty Street streetscape will vary across the World Trade Center site. Between West and Greenwich Streets, pedestrians will pass through the open space of Liberty Park. Streetscape elements and planting patterns should be integrated with the open spaces at Liberty Street. On the south side of Liberty, streetscape elements should be maintained to provide visual continuity through the site. The curb cuts for the car/bus/truck entrance and exit should be designed to preserve pedestrian safety and movement.

Because of underground structures, soil depth is limited in this area. Where in-grade street trees are not possible, raised areas may be created, although these should be kept low to maintain a connection to surrounding areas and encourage pedestrian use. Pedestrian lights and other furnishings and plantings can also contribute to pedestrian scale in this area. Proper screening of the car/bus/truck entrance and exit in Liberty Park should be studied to reduce the visual and physical impacts of this element.

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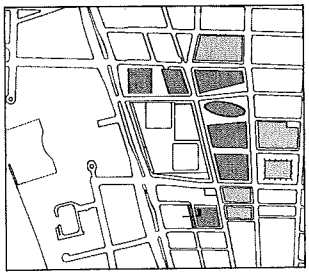
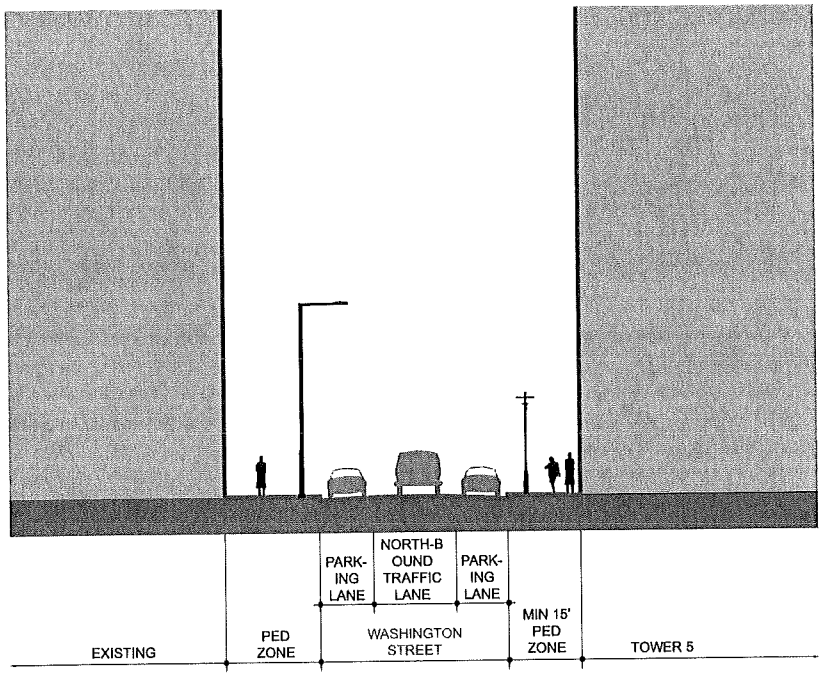
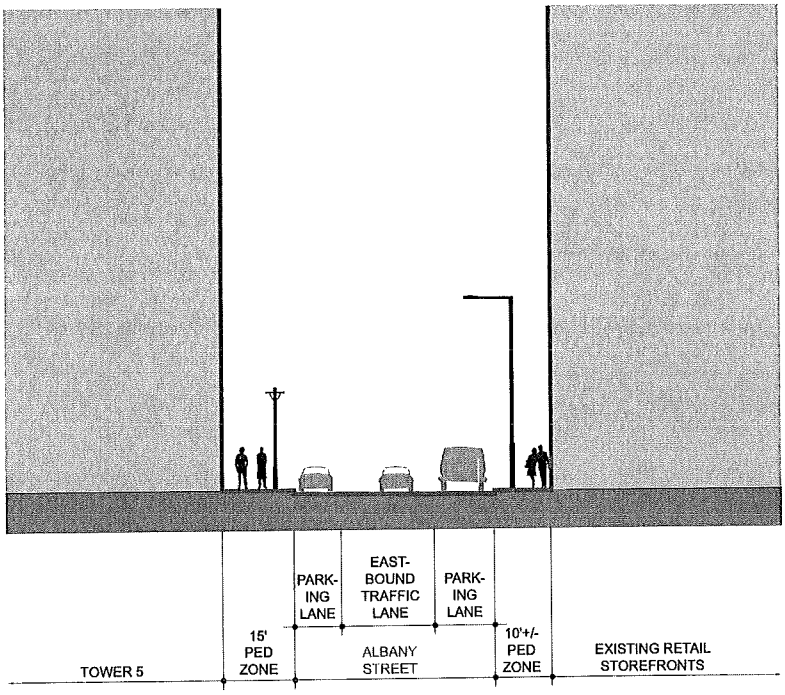
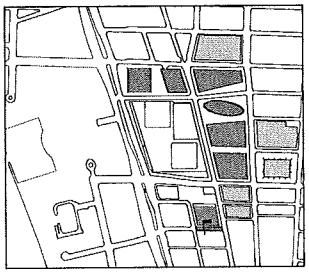




6.4.5.8 Washington Street - Typical Streetscape

This minor street will serve local traffic, and curb uses on both sides will provide loading zones for adjacent retail and office uses. Narrow sidewalks limit the possibility for street trees. Other streetscape elements, such as pedestrian lighting and furnishings, can be used to establish a pedestrian scale and provide streetscape continuity.





Albany Street - Typical Streetscape 6.4.5.9

As one of the few through streets between Battery Park City and Greenwich Street, vehicular traffic will travel east on Albany Street. Narrow sidewalks will limit the possibility for street trees. Other streetscape elements, such as pedestrian lighting and furnishings, can be used to establish a pedestrian scale and provide streetscape continuity.

Pedestrian lights should be introduced to establish a pedestrian scale and encourage use of the street at night.

6.4.5.10 West Street

West Street (Route 9A) serves as a major north-south arterial running along the west edge of the city. Prior to September 11th, 2001, particularly south of the World Trade Center, the length of West Street (Route 9A) was dominated by vehicles and required pedestrian bridges for safe passage to the World Trade Center. On the new World Trade Center site, West Street will become a critical gateway to the Memorial, as well as the Freedom Tower. The areas adjacent to West Street should be designed in the character of the other public open spaces of the project site. The design should be coordinated with the design of the Memorial and with NYSDOT plans for the other adjacent pedestrian areas along West Street. Currently NYSDOT is developing an at-grade design for West Street. The design of the streetscape along West Street shall be coordinated with NYSDOT. On West Street a dense overhead canopy will help define this as a greenspace connected with the World Trade Center site and the streetscape of West Street.

The World Trade Center site provides the opportunity for a comprehensive and integrative approach to urban design, building design, and landscape design. The Memory Foundation Master Plan and Commercial Design Guidelines recognize this opportunity and strive to create a richness of open space and built space on the site, and an integration of above-grade, at grade and below grade elements.

Comprehension and integration are not only the best ways to create urban and spatial richness on the site, but are also two of the strategies for achieving sustainable approaches to the development and life of built and open spaces. Section 8, Sustainable Design Guidelines, as well as the Sustainable Guidelines Implementation Matrix, discuss in detail these and other sustainable strategies.

Each of the Sustainable Design Objectives in Section 8.2.1 (Daylight/Solar Resource Management, Water Quality and Conservation Management, Air Quality Management, Energy Conservation, Material Conservation, and Construction Environment), are applicable to varying degrees to the design of streetscapes and open spaces. Please refer to this section for specific detail.

The specific Sustainable Design Guidelines outlined in Section 8.3 should be applied to the design of streetscapes and open spaces. In particular, the sections on Urban Environmental Qualities (Section 8.3.1) and Site/Parcel Environmental Qualities (Section 8.3.2) articulate intents and recommend actions for the development of open spaces on the World Trade Center site.

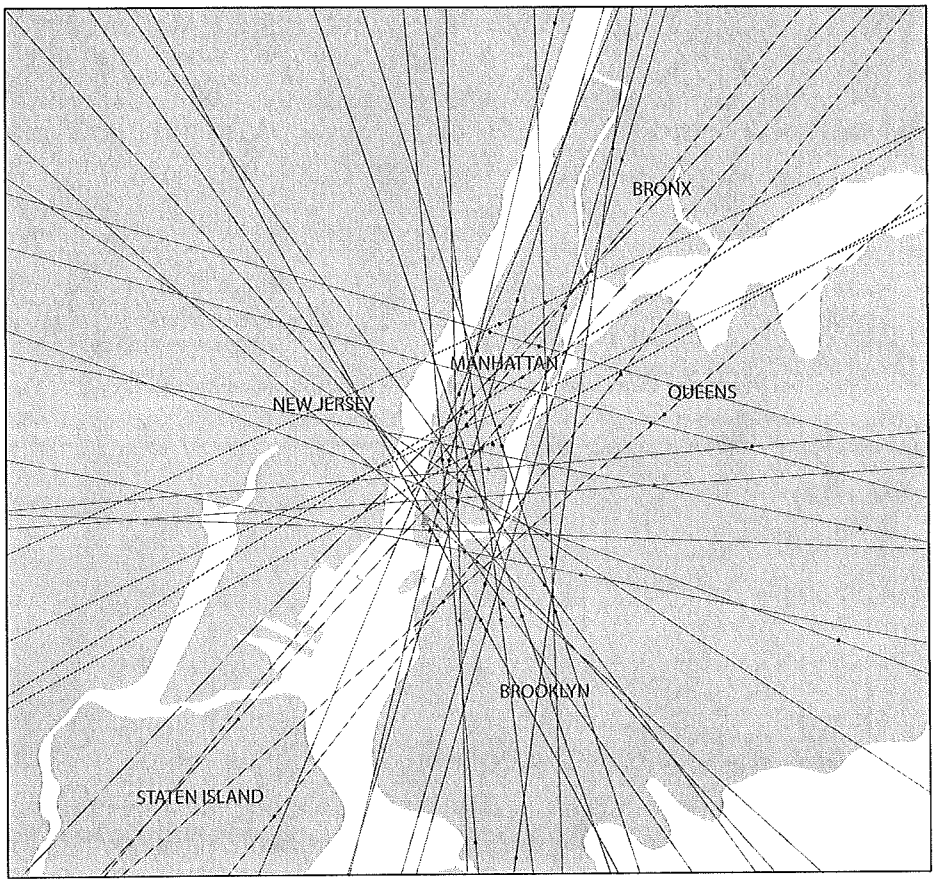
6.6 Security

Security devices installed on the World Trade Center site should be integrated with the design of public open spaces and streetscape elements to the maximum extent possible while remaining consistent with security criteria. These devices should be considered urban design features and should allow for pedestrian flow throughout the site as well as visual connectivity. The pedestrian experience throughout the World Trade Center site should be marked by unobstructed movement to the greatest extent possible, while maintaining appropriate security standards. In addition to allowing for ease of movement at-grade, security devices on the site should be designed to minimize obvious barriers while maximizing design excellence with a coherent and uniform strategy. As with all streetscape elements, security devices should be consistent throughout the World Trade Center site. The aesthetic qualities of such devices should be one of the key considerations in determining the appropriate security solutions. Devices should be of high design quality, durable and well-constructed while providing for transparent or unobtrusive perimeter protection. Designers should use innovative security approaches to avoid creating threatening and fortress-like spaces and to preserve the unique qualities of the World Trade Center site. In addition to commonly used security devices such as bollards, grade changes and additional streetscape elements like trees, benches, ornamental metalwork, fountains, custom light fixtures, custom planters and bike racks can serve as deterrents to vehicular traffic.

At the New York Stock Exchange, sculpted, cast-bronze sidewalk barriers deter vehicles from entering at specific locations, while retractable delta barriers allow only authorized vehicles to pass.

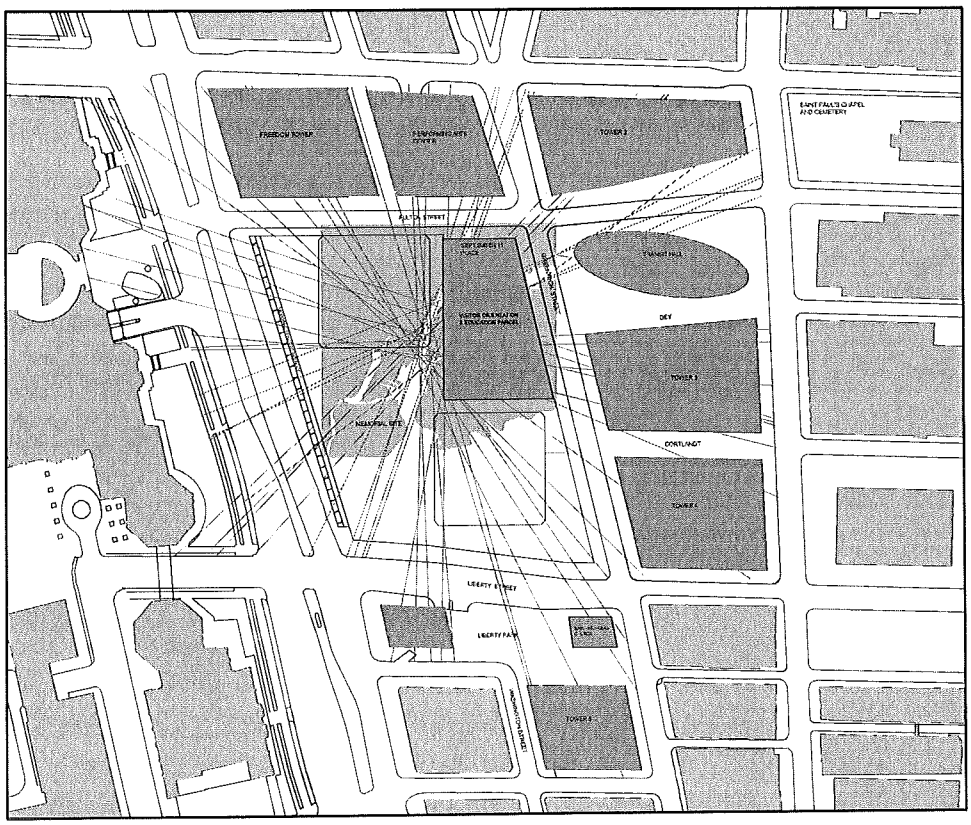
In Boston, 35-foot-long blocks of shaped black granite akin to stone sculptures prevent cars from driving into the lobby of the Fleet Boston Tower.

6.7 Heroes' Matrix



The Heroes' Matrix was introduced to honor the rescue workers of September 11, 2001 by lending a special identity to the public spaces of the World Trade Center site. It consists of an irregular grid of relationships within the metropolitan area between fire stations and police stations.

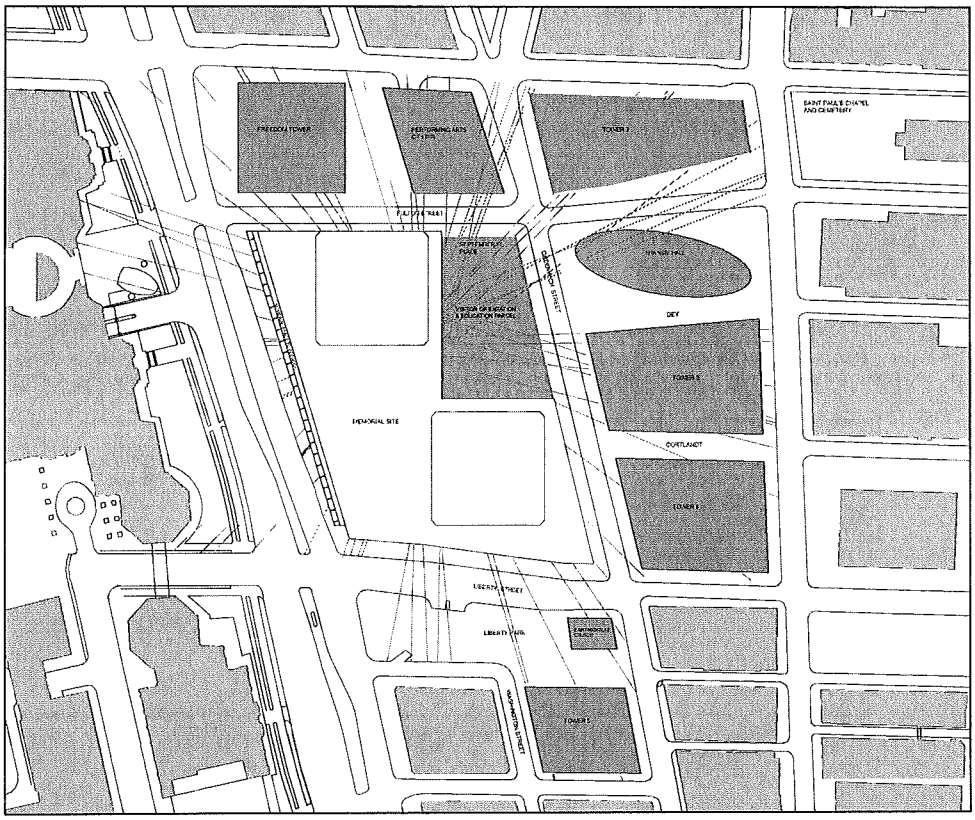
The relationships established by the matrix are rendered as lines on the site which loosely converge on the Memorial precinct. The lines may be physically expressed in public spaces on the site, but not in the Memorial. Lines may be expressed in the paving (lines of special materials, edges between paving types, etc.), the landscape (trees, hedges, turf, etc.) or both. The matrix should establish a hierarchy of public spaces and pedestrian connections. Lines should be strong and clear in the major open spaces near the Memorial, such as September 11th Place, the Wedge of Light Plaza and HUB Plaza. Near the edges of the site, lines can be rendered less distinctly. Where important connections occur, matrix lines may continue off the site. This would require coordination with the World Financial Center, New York City Planning, and NYSDOT.



The pattern created by the lines through this strategy creates an area of increased density where the majority of lines converge near the center of the diagram. The matrix map and its inscribed lines are then manipulated in scale and overlaid over the site. The scale is reduced so that all mapped stations would fall within the Memorial precinct. In the overlay, the dense convergence of lines appropriately occurs in the area of September 11th Place, roughly centered between the footprints of the original towers.

Its lines are used to articulate all public spaces at ground level (not the Memorial): sites A-I including streetscapes. Its pattern is densest in the spaces near the memorial such as September 11th Place and the Wedge of Light. The pattern is diffused as one moves out from the center of the site so that lines at the perimeter are visible, but do not dominate the streetscapes and spaces. Lines are extended south of the site proper across Liberty Street to connect built parcel 5 and 8 and open space site E. Lines are extended off the site to the west to connect the Fulton Street Corridor across West Street to the World Financial Center and the Winter Garden.

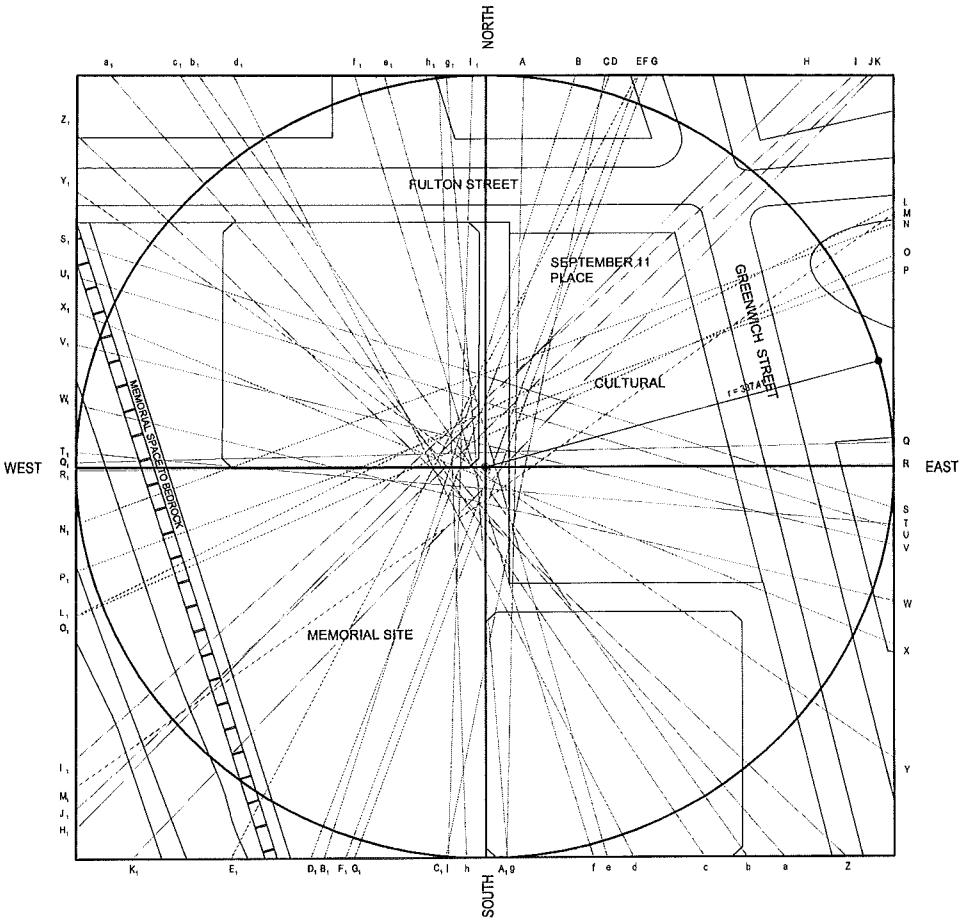
The diagram on this and the following pages show the progression of the He-



roes' Matrix as it is overlaid on the site as a means of creating a distinct identity and hierarchy for the public spaces.

The diagram and table on page 160 provide the necessary information to layout the matrix lines. A coordinate system is established by locating a centerpoint where a north-south axis aligned with the west edge of the South Tower footprint intersects an east-west axis aligned with the south edge of the North Tower footprint.

A square, approximately 675 ft per side (or the distance from the south edge of the South Tower footprint to the coordinate center), is inscribed on the site and centered on the coordinates. Each matrix line is then described by the locations of its endpoints on the square relative to the coordinate system.



A	31.34' east	A_1	17.26' east
B	74.36' east	B_1	133.36' west
C	98.36' east	C_1	33.44' west
D	102.42' east	D_1	144.20' west
E	124.90' east	E_1	209.69' west
F	126.36' east	F_1	115.69' west
G	133.89' east	G_1	108.40' west
H	264.74' east	H_1	311.43' south
I	304.63' east	I_1	250.57' south
J	316.58' east	J_1	294.22' south
K	320.89' east	K_1	291.37' west
L	223.67' north	L_1	126.90' south
M	217.90' north	M_1	274.78' south
N	209.37' north	N_1	48.37' south
O	181.75' north	O_1	128.32' south
P	168.75' north	P_1	89.35' south
Q	20.38' north	Q_1	4.43' north
R	1.79' north	R_1	2.69' south
S	36.23' south	S_1	192.19' north
T	50.27' south	T_1	13.16' north
U	53.71' south	U_1	164.20' north
V	68.09' south	V_1	105.48' north
W	116.59' south	W_1	54.09' north
X	154.19' south	X_1	133.58' north
Y	252.57' south	Y_1	237.61' north
Z	298.10' east	Z_1	286.02' north
a	246.82' east	a_1	309.84' west
b	216.11' east	b_1	237.75' west
c	180.91' east	c_1	253.33' west
d	121.38' east	d_1	209.30' west
e	100.19' east	e_1	84.28' west
f	88.86' east	f_1	108.94' west
g	17.95' east	g_1	33.13' west
h	15.91' west	h_1	39.11' west
I	30.87' west	i_1	11.12' west

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RETAIL GUIDELINES 7

Retail spaces are critical to the World Trade Center's success as a lively, urban environment. At the same time, their character and locations must be balanced with sensitivity to the Memorial as well as the identity of other institutions and commercial considerations. This section establishes guidelines for retail spaces on the site, with particular attention paid to the relationship among retail, public concourses and streetscapes.

Introduction 7.1

Types and Character of Retail 7.2

Storefront Guidelines 7.3

Above Grade Storefronts 7.3.1

Storefront Entries and Identity Zone 7.4

Exterior Accessory Structures 7.5

Food Service Establishments 7.6

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7.1 Introduction

Retail spaces at the World Trade Center site are critical to creating a lively urban experience. Street level retail will create an identity for the site at-grade and will provide for an engaging pedestrian experience, similar to Fifth or Madison Avenues. At-grade street entrances to shops are encouraged.

The retail spaces will also activate the system of underground concourses that connect through the site and will offer convenience to transit customers. The success and public image of the World Trade Center will depend on the quality and vitality of its retail spaces and its ability to enliven the streetscape.

Retail spaces must be carefully integrated into the overall World Trade Center development. They must assert their own character, while respecting the stature of adjacent uses. They must add energy to the site, and complement the contemplative and respectful nature of the Memorial. They must be allowed to develop their own image, and still fit within the larger identity of the site as a whole. Retail hours of operation should be maximized to enhance the quality of life for Lower Manhattan residents, workers and visitors.

Shopping in New York is defined by the energy and diversity of its retail. At-grade retail within the development is to embrace and reflect this spirit. However, care must be taken to maintain a high degree of consistency and quality in the expression of the retail in order to reflect the world-class nature of this development.

Storefronts, signs and brands need to be presented in a manner that respects tenant standards and has a coherent identity as part of the overall World Trade Center. Retail and office areas also serve as part of the transportation network as well as the base for office structures. The synergy that results from this mix of uses, and the prominence of public transit on the site, create the ultimate value to the retailer.

Servicing shall not be permitted from the curb, except in cases of a tenant that is isolated from service.

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Types and Character of Retail 7.2

While the guidelines presented here do not set out permitted or prohibited uses, it is important to communicate the desired character of retail space on the site, so the nature of these establishments has a consistency and quality that strengthens the overall concept. The presence of retail will serve as the connective tissue between the various addresses of the development. It is important that the expression and character of the retail be of high quality.

First, development on this site must be of world-class quality. The international attention focused on this site, the number of visitors who will come to the site from around the world, and the prominence of the site in New York, all require that a high standard of excellence be achieved. Each tenant should move beyond the customary standards of their particular operation and strive for a design that reaches a greater level of refinement.

Second, it is important to consider the role of retail use on the World Trade Center site as it relates to the rest of Lower Manhattan. Other than the South Street Seaport at the opposite end of Fulton Street, no large concentration of retailers exists in Lower Manhattan. Retail at the World Trade Center will establish a high level of service, choice and convenience. Retail on this site should complement retail throughout Lower Manhattan and local retailers should be encouraged.

Third, the office lobby entrances, grouped along the Greenwich Street corridor, form a transitional element between the Memorial experience to the west of Greenwich and the retail commercial environment to the east along the Church Street corridor. To respect the Memorial, retail frontage and retail signage should be directed to the Church Street Corridor and cross street areas. Retail Signage should not be directed toward the Memorial.

As retail on the World Trade Center site is distributed among at-, below-, and above-grade locations, the emphasis in designing such spaces should be on maintaining a strong connection to the street. Ensuring access to light and views should be a key priority in the configuration of above-grade retail. Multi-level retail spaces are encouraged, providing a connection from the street to both above and below-grade retail spaces.

Finally, the diversity of people who will frequent the retail areas will suggest the range of commercial uses for the site. Nearby residents, commuters, workers, and tourists will all be retail customers. Each of the groups has different needs and interests and the mix of retail should take this diversity into account. Each of them is likely to travel along somewhat different paths. Each group's needs can be accommodated in appropriate locations on the site and will be determined by the Port Authority and their lessee in accordance with an appropriate merchandising plan approved by the Port Authority.

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7.3 Storefront Guidelines

The storefront articulates the transition between public areas and the commercial realm of the retailer. At the World Trade Center the storefront has a dual purpose: to allow the retailer to establish its image and also to create a consistency of design that connects each store to the larger context. This larger context suggests a common vocabulary of architectural expression for the storefront wall, specific to the base building that surrounds it.

See section 9, Signage Guidelines, for retail signage requirements.

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One of the most significant and visible parts of the World Trade Center site will be the street-level frontage of the various commercial buildings. The frontage will create a significant part of the experience for the pedestrians using any of the streets within or surrounding the WTC site.

In order to create an active, lively and vibrant public realm, ground floor plans, on Church Street, Fulton Street, Vesey Street, Liberty Street, Dey and Cortlandt, will be designed to "maximize" retail street frontage. The design must be consistent with first class building aesthetics and will include entrances for Class A Office tenants where circulation and security must be considered.

The final determination of the retail street frontage should include the following goals:

- Provide for the maximum amount of vitality and life along the street
- Provide sufficient amount of first class street-level retail to support that street life

Storefronts for above-grade areas should be integrated with the design of the individual buildings in which they are located. Therefore, there can be some variation from building to building, as long as several design principles are observed:

Storefront glazing should be clear glass, with at least two-thirds of the frontage transparent. Designers of structures should carefully consider the location of emergency exits and messenger entries so that openings do not conflict with retail frontage.

Mullion spacing materials, and proportions will be the result of decisions about the architecture of the structure above. There should be consistency between proportions, materials and details. Thus, the use of a uniform module is encouraged, but not required. All-glass or butt-glazed systems are preferred for storefronts. Introduction of opaque areas, such as stone or metal panels, is allowed, in patterns that relate to the building architecture.

Retail storefronts should be designed to be compatible with the unique architectural design features of the individual buildings within the World Trade Center site.

The following chart indicates the minimum retail frontages for Church and Fulton Streets. These percentages are based on the frontages of Towers 2, 3 and 4 only. The intent of these percentages is to maximize retail.

Minimum Retail Frontages along:

Church St (Between Vesey & Liberty St)	70%
Fulton St (Between Greenwich & Church St)	14%

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7.4 Storefront Entries and Identity Zone

Entrances into the storefronts can be accommodated in several ways. First, standard openings, accommodating a pair of glass doors (and optional sidelight), should be used by tenants with frontages 30 ft. or less. Doors that swing into concourses or sidewalks shall be recessed. Tenants whose frontage is wider than 30 ft. may use horizontally sliding sections of glass and metal door panels. The appearance of the entry when the retail space is closed must be given as much consideration as when the space is open. Security grills, if required, must be inside the glazing line and should be fully behind the storefront display zone. Fully opaque grills are prohibited. Door hardware shall be of high quality and shall be consistent with commercial building standards.

The first few feet behind the storefront is the critical zone for establishing the identity of the retailer. In this space, displays that establish a refined merchandising image are encouraged. The interior architecture of this zone can be tailored to meet the identity of the store. The use of color, varied materials, and creatively displayed merchandise are generally left to the discretion of the tenant. This area can be left open to allow views deep into the store, or can serve as a screen limiting views. Merchandise-intense outlets such as drug stores, bookstores, newsstands, card shops, gift shops, food markets and the like should screen store interiors through well-designed displays facing the storefront. All materials used in the identity zone should be of the highest quality.

7.5 Exterior Accessory Structures

In permitted areas, retail uses may extend beyond the limits of the storefront wall. This can occur in kiosks and temporary structures. Kiosks are semi-permanent retail structures where inventory and equipment can be secured over night. Temporary structures may include easily demountable tents or exhibit structures. They should be designed with a consistent look.

Kiosks and temporary structures may be permitted in areas where they can serve to enliven the location and that do not conflict with circulation routes or other programmed uses on the site. Temporary structures may be erected in Liberty Park, the WTC Hub Plaza, the Wedge of Light Plaza or other open spaces subject to approval. Special events in the Wedge of Light Plaza north of Fulton are limited to 12 days per year and if it is more than this would need the consent of the Tower 2 office net lessee and WTC Retail owner. All special events should be in keeping with the retail and office building entry environment.

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Temporary structures are permitted on Cortlandt and Dey only during "Special Events", which shall be limited to no more than twelve (12) times per year. Such "Special Events" shall consist of arts, cultural or similar events held on weekends only and open to the general public, but may also include weekday or weekend commemorations or other events of public significance with respect to the World Trade Center site. A "Special Event" may continue for no more than a twenty-four (24) hour period, which will include pre- set-up and post-cleanup activity. The Port Authority or Net Lessee will inform City Planning at least two (2) weeks prior to such an event and shall provide City Planning with a list and description of all such events held during each calendar year by January 31st of the succeeding calendar year.

Food Service Establishments 7.6

Restaurants, cafes, food courts and other food service establishments represent unique challenges and benefits. These uses can activate and enliven spaces, but also can impact their surroundings if noise, odor and trash is not carefully managed. Therefore their locations and design need to be considered carefully. The location and design of outdoor dining areas should be temporary in nature with no permanent outdoor features and should not interfere with pedestrian flows and public access to walkways and public open spaces. Outdoor shades should be uniform in shape and color with consistent graphics.

Street level food service establishments must conform to the requirements of other retail spaces. Outdoor dining areas are encouraged.

Food service establishments are especially encouraged on second and third-floor levels. Seating areas should be located at the perimeter, adding visible life to the street. Service areas should be held back from the building perimeter.

All food service exhaust shall be coordinated with the commercial building mechanical system requirements.

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SUSTAINABLE DESIGN GUIDELINES 8

The Sustainable Design Guidelines for the World Trade Center redevelopment projects identify and describe the environmental and sustainable attributes that are to be sought and that are to be achieved in the design of each of the buildings and structures as the master plan is realized.

Introduction and Potentials 8.1

Sustainable Design Objectives 8.2

Daylight/Solar Resource Management 8.2.1
Water Quality and Conservation Management 8.2.2
Air Quality Management 8.2.3
Energy Conservation 8.2.4
Material Conservation 8.2.5
Construction Environment 8.2.6

Sustainable Design Guidelines 8.3

Urban Environmental Qualities 8.3.1
Site/Parcel Environmental Qualities 8.3.2
Water Environmental Qualities 8.3.3
Energy Environmental Qualities 8.3.4
Material Environmental Qualities 8.3.5
Indoor Environmental Qualities 8.3.6

Alternative Compliance Path 8.4

8.1 Introduction and Potentials

The nature and scope of the redevelopment reaches beyond the traditional boundaries of "building and site" and poses significant challenges and opportunities when framing sustainable potentials.

As a "first order" observation, the entire development is shaped by the "movement infrastructure" of mass transit, roadways, rail, footpaths, escalators and elevators transporting the tens of thousands of people arriving by ferry, rail, subway, bus, car and on foot to and through this unique community of spaces in the heart of the nation's most dense urban center.

This unique urban center in combination with this infrastructure supports very high levels of development density and supporting services. By breaking out of the traditional individual building model, the development creates a wide range of opportunities for shared resources, capitalizing on the opportunities inherent in urban density and adjacency. The redevelopment, in short, has the potential to establish a leadership model of urban sustainability.

The realization of key potentials, fundamental "whole system" strategies such as district heating/cooling, river water cooling and shared service facilities creates an infrastructure and "connective tissue" that points in the direction of a true leadership project. The purpose of the Guidelines is both to establish a new level of environmental/sustainable quality for an urban center model and to identify the "pathways" to higher performance over time.

Framework

Capturing the urban scale, mixed use and whole-system attributes of the redevelopment has led to an expansion of the traditional model for green guidelines. Notably, as an interrelated list of standards, the guidelines overall exceed the objectives of NY State Executive Order 111 (EO-111), which includes meeting the US Green Building Council's (USGBC) Leadership in Energy Efficiency (LEED™) Green Building Rating System's certified level and have been reviewed by the PANYNJ and LMDC.

The challenge then from an environmental sustainable perspective, is to describe a framework of guidelines/metrics, which capture the urban scale/mixed use development, can be applied to purely infrastructure and partial projects over time and can address traditional projects. This objective, which creates a level playing field for assessment and "sustainable" quality has the added advantage of meeting the need for annual reporting and/or audit under the requirements of EO-111. The scope of this effort has allowed the development of a basic framework consisting of a stated "Purpose" and "Action" for each guideline, which will be fully supported by Reference Documentation.

Four basic qualities are unique to these guidelines;

1. **Urban Environmental Quality (UEQ)**

A unique set of large-scale sustainable qualities that the projects bring to the surrounding community and urban context. There are a number of "Green Guide-

lines" around the United States, including the New York State Green Building Tax Credit (NYSGBTC) and the USGBC's LEED Green Building Rating System, which are excellent references and have been selectively incorporated herein. However, these are inherently focused on a specific building type or project. At the project site, there are issues of regional and neighborhood scale – regional transportation systems, relationships to surrounding neighborhoods, as examples – that have informed the development of these strategies and guidelines that go beyond individual buildings.

2. "Whole system" compliance

This organizing principle of the guidelines assures that integrated and overlapping qualities of all project elements (and the spaces in between) are accounted for by having a project-wide "basket" of guidelines from which each individual project is custom tailored. Therefore each individual development, by type, will have only the relevant guidelines assigned, and even a small project or renovation will be assigned a short list of relevant guidelines. (Note: See the attached Matrix for examples).

3. Individual projects can draw from a basket of measures with flexible range of scale.

As an interrelated list of standards, in addition to 1 and 2 above, the guidelines overall exceed the objectives of EO-111, have been reviewed by the PANYNJ and LMDC and offer flexibility to design teams. Guidelines indicated as "Required" are mandatory and flow directly from the objectives of EO-111, LEED™ certified level requirements and the larger requirements of the PANYNJ and LMDC. Required items are to be implemented. The LEED™ "Roadmap for Silver" creates a pathway for moving toward even higher performance. Flexibility is provided through an "Equivalency Option" which allows designers to propose an "equivalent option" for a guideline which is part of the LEED™ Calculation, as long as the number of LEED™ points remains the same or better. Guidelines indicated as "Recommended" are provided to support efforts by teams seeking additional opportunities to improve environmental performance. Guidelines, which include the "Exemplar" as described in item 4 below will also be indicated as part of tenant recommendations. Some of the guidelines include extended considerations and larger scale impacts, important to the realization of the guideline. These "Universal" impacts, for instance the requirement for water management plans, which also benefit the municipal water infrastructure, are indicated. The Implementation Matrix indicates "Required", "Equivalency Option", "Recommended", "Exemplar" and "Universal" designations with a distinct set of symbols.

4. Integrated Building Design and Tenant Spaces

There is seldom an integration between the construction of cores and shells, which is the responsibility of the developer, and the fit-out of tenant spaces. This has traditionally been an impediment to achieving an integrated high performance design, particularly in commercial office projects.

In order to create an integrated project design and capture the maximum performance potentials of such preferred tenant fit-outs, each major office and retail segment will design and build an "exemplar" or model of a typical high perfor-

mance tenant fit out. The performance attributes (energy savings, daylight, air quality, etc.) of the space will be fully quantified and described in the reference standard: the WTC High Performance Prototype and advocated as the landlord "preferred" standard. Tenants will be encouraged to apply to federal, state, municipal and utility incentive programs for assistance in offsetting initial investment costs.

Specific Plans

A specific way in which these guidelines are unique is in the requirement for development and implementation of Resource Management Plans and the development of "exemplars", models for integration of commercial and retail, "shell and core" with high performance tenant fit-outs. The 11 Resource Management Plans, required as part of this set of guidelines, go beyond the framework of existing Green Building Rating Systems (LEED™ for instance, only requires 3 of the 11 incorporated here) and clearly demonstrate the broader consideration of sustainability potentials inherent to the development. These plans will be assured through an approval process requiring the submission of compliance templates, calculations and field verification. The exemplars will also be required to meet performance criteria established in a WTC High Performance Prototype.

The following Plans and Studies are required as part of these guidelines. Each plan will require the submission of appropriate documentation such as letter templates, calculations and documentation in the sequence of "Implementation Reviews" running from Conceptual/Schematic to Construction Administration/Signoff (see Implementation Authority)

The following Plans and Studies are required as part of these guidelines:

SEQ-1 Comprehensive Resource Management Plan
SEQ-5 Construction Environment Plan
SEQ-6 Construction Storm Water Pollution Prevention Plan
WEQ-1 Water Management Plan
EEQ-1 Energy Management Plan
EEQ-3 Building Energy Model
EEQ-5 Renewable Energy Transition Plan
MEQ-1 Materials Management Plan
MEQ-2 Construction Waste Management Plan
IEQ-1 Indoor Air Quality Management Plan
IEQ-5 Construction IAQ Management Plan
IEQ-9 Integrated Pest Management Plan

Structure of Guidelines

The Guidelines will be organized in three basic parts:

I. Master Plan Objectives:

A summary of sustainable design objectives organized by general subject headings.

II. Master Plan Sustainable Design Guidelines:

A specific listing of Purpose and Action for each guideline organized by subject to facilitate exceeding EO-111 and its related cross-reference to LEED™ Certified level. (Note: Currently being completed are the supporting reference documents, standards and case studies for all non-LEED requirements.

III. Guideline Implementation Matrix:

A matrix is provided to describe how each purpose and action would be applied to selected project types.

Implementation

The Sustainable Guidelines have been developed as an integral part of the Commercial Design Guidelines for WTC Redevelopment Projects. These guidelines reference the current LEED™ 2.1 Building Rating System for new construction. As new versions of LEED™ are adopted by the USGBC in the future, these guidelines will be updated to maintain conformance with EO-111. The projects will exceed the New York State Energy Conservation Construction Code by at least 20%.

The guidelines that are cross-referenced to the USGBC's LEED™ Guidelines, must meet USGBC's requirements, which are supported by a context or background statement. The USGBC has also developed a detailed Reference Manual for these LEED™ Guidelines, which provides specific guidance and case studies to assure clarity and full implementation. As with all codes and reference standards, this supports and facilitates the efficiency/currency of the design team's work. The remaining guidelines herein, that currently consist of only Purpose and Action Statements, will be supported by their own detailed Reference Manuals. The Reference Documentation of USGBC's LEED™, will also be supplemented by some location-specific New York City and World Trade Center Site comments and/or elaboration.

Consistent with the Commercial Design Guidelines process, the implementation of these Guidelines will be accomplished by the review process administered as described in Chapter 10 of the Commercial Design Guidelines. This process will require each project to be reviewed for compatibility and conformance with these Sustainable Design Guidelines, as well as, the Commercial Design Guidelines. The attached "Implementation Matrix" provides clarification of the process by way of a listing of some general building types and their relevant guidelines.

8.2 Sustainable Design Objectives

8.2.1 Daylight/Solar Resource Management

Maximize Available Outdoor Daylight Resources to Public Spaces
Design buildings and site structures to optimize available daylight for public open spaces and green areas. Utilize shadow studies to track path of sun and assist in final design of outdoor public spaces. Organize site structures, materials and landscape to improve environmental comfort of outdoor spaces and mitigate the effects of heat islands. Consider site environmental wind conditions. Select and locate materials and landscape features so that thermal properties and shading effects will extend outdoor comfort levels further into the shoulder seasons.

Daylight Harvesting & Views for Tower Interiors
Maximize daylight harvesting. Design exterior building envelope to facilitate daylight penetration to regularly occupied tenant spaces. A demonstration model of a tenant fit out will be provided to demonstrate these daylighting strategies. This model will provide building occupants with direct line of sight views to the outdoors from the majority of regularly occupied spaces and control glare.

Daylight Harvesting & Views Below Grade
Maximize daylight penetration to concourse areas and below grade retail areas. Provide views to the outdoors from concourse areas to assist users in wayfinding and orientation.

Heat Island Effect Mitigation
Reduce site development contributions to "heat island" effects in Lower Manhattan. Provide landscape planting (green infrastructure) coupled with high albedo surfaces at other areas to mitigate thermal gains of site surfaces and building roofs.

8.2.2 Water Quality and Conservation Management

Comprehensive Water Management Plan
Implement a Water Management Plan to optimize use of storm water, waste water and potable water and provide a coordinated management plan in conjunction with full site development. Study on-site reclamation of wastewater.

Storm Water Capture and Reuse
Capture and utilize storm water flows. Consider towers with ledges, roofs and setbacks, which will assist in capturing water sheeting off buildings at high elevations to reduce water pump energy requirements. Use reclaimed storm water and/or site water for toilet flushing, cooling tower makeup, vehicle maintenance and irrigation needs.

Water Use Efficiency
Seek highest water efficiency within buildings and reduce the burden on municipal water supply. Design landscape to minimize potable water requirements. Endeavor to utilize waterless urinals and high efficiency fixtures.

Air Quality Management 8.2.3

Site Air Quality

Work to improve site outdoor and neighborhood air quality. Support and expand pedestrian accessibility and increase bicycle access. Reduce site generated vehicular emissions.

IAQ Performance and Monitoring

Optimize the indoor environment for the comfort, well-being and enhanced productivity of the buildings' occupants by establishing minimum indoor air quality (IAQ) performance and standards. Provide indoor air quality monitoring so that a standard of quality in the overall indoor environment and resulting well-being of the occupants is maintained.

100% Outside Air

Provide capability for 100% outside air where practicable and balanced with energy conservation to support the comfort and well-being of building occupants.

Low Emitting Materials

Minimize indoor air contaminants originating in materials, that are harmful to the comfort and well-being of building occupants and users. Specify materials with no or low volatile organic compounds (VOC's) and other toxic characteristics which affect IAQ.

Chemical & Particulate Control

Minimize sources of chemical and particulate air contamination. Design all major entrances with permanent walk-off grilles. Mitigate health concerns caused by unwanted pests, their excrement and the typical, toxic chemicals used to control them through the development of an integrated pest management plan. Provide high efficiency filtration of all air to occupied areas.

Energy Conservation 8.2.4

Comprehensive Energy Management Plan

Conserve and optimize energy use and minimize air emissions, associated with energy use, through the implementation of a Site/Building Energy Management Plan.

Provide for ongoing verification of optimal operation and energy utilization of building energy systems by providing a computerized, fully-integrated Building Management System (BMS). Provide for full building commissioning with ongoing verification, maintenance and energy systems management.

Opportunities for Energy Conservation

Review large and small scale opportunities for energy conservation and enhanced reliability and capacity. Include exploration of the feasibility and poten-

tial benefits and reliability of co-generation, central heating/cooling, river water cooling and recovery of resources.

Renewable Energy

Utilize on-site or purchased renewables for at least 20% of site energy requirements (by 2010 per EO-111) and prepare a plan for further transition to renewable technologies as these become more cost-effective. To the extent practicable, provide pathways, access and space allocation for "near threshold" renewable and clean energy technologies such as solar and fuel cells.

Optimize Energy Performance

Optimize the performance of building energy systems through the utilization of a full DOE-2.1E or Energy Plus building energy model to compare energy conservation, in alternative strategies. Integrate with Site Energy Management Plan and implement strategies for moderating peak power loads. This is to include the full analysis of architectural and mechanical decisions in relationship to building energy expenditures to achieve a minimum 20% decrease in energy consumption from ASHRAE 90.1-1999. This savings reflects both tower and office tenant build-out potentials. Tenant build-out potential (as demonstrated in a typical tenant build-out) will be modeled in the same integrated exercise and the economic results provided to potential tenants in support of the preferred buildout. Information will be provided to tenants.

Metering at Point of Use

Implement end-user metering of electricity to maximize tenant incentive for resource conservation.

Ozone Layer Protection

Reduce emission of ozone depleting chemicals. Specify building HVAC systems and materials with zero levels of CFC refrigerants.

Thermal Comfort & Personal Control

Provide building users with a high level of thermal, ventilation and lighting system control to promote comfort, well-being and enhanced productivity.

Light Pollution Reduction

Reduce light pollution to surrounding sites and night sky. Satisfy Illuminating Engineering Society of North America (IESNA) recommended practice per manual (RP-33-99) for exterior illumination. Tower tops to be exempt from these requirements.

8.2.5 Material Conservation

Comprehensive Material Management Plan

The Material Management Plan provides a tool for an optimized utilization of all site material resources. This integrated resource management tool is designed to reduce waste generated by building occupants that would otherwise be hauled to and disposed of in landfills and/or incinerators. Consider potential of "design

for disassembly" strategies on IAQ and site material resourcefulness. Encourage the re-use of existing site structures, utilities and foundations. Incorporate previously used building materials and products into new construction where practicable.

Construction Waste Management

Reduce the amount of construction and demolition (C&D) waste going to landfills and/or incinerators and conserve resources through reuse and recycling.

Recovery of Resources

Study small and large-scale opportunities for recovery of resources along with Energy Conservation measures. Provide space or means for recycling of resources on site during operations.

Materials with Recycled Content

Increase markets for building materials and products that incorporate recycled content.

Material Proximity

Encourage the use of building materials and products that are extracted and manufactured or assembled within a 500-mile radius of the site.

Agricultural Materials

Encourage the specification of materials, which are renewable and are grown in such a way as to support biological diversity and the health of the ecosystem.

Specify lumber, wood and wood products, which have been harvested according to sustainable forest management principles, and have been certified under the Forest Stewardship Council (FSC) guidelines, in conjunction with the Materials Management Plan.

Construction Environment 8.2.6

Construction Environment Pollution Prevention

Reduce pollution and noise from construction activities and vehicles. Implement a Construction Environment Plan designed to reduce pollution and noise from construction activities and vehicles to adjoining neighborhoods. Develop a materials staging and construction access plan prior to start of construction. Control site erosion, collect and utilize storm water as appropriate, and reduce negative impacts on hydrological and atmospheric systems produced by construction activities, through use of ultra low sulfur fuels as appropriate.

Construction IAQ Management Plan

Implement a Construction Indoor Air Quality Management Plan consistent with EO-111.

Phased Development

Address both the "active" portions of the site under development, as well as, the "inactive" areas of the site, which have a supporting role. These inactive areas will have a smaller, focused list of guidelines to address storm water, heat island mitigation and other site issues applicable to temporary sites with PANYNJ oversight.

8.3 Sustainable Design Guidelines

8.3.1 Urban Environmental Qualities

UEQ-1: Support Urban Development

Purpose: Support development in existing urban areas and fully utilize and support existing infrastructure.

Action: Channel development to urban areas. Provide development that supports and maximizes the use of existing infrastructure and exceeds a minimum development density of 60,000SF/acre.

UEQ-2: Expanded Public Transit and Bicycle Access

Purpose: Encourage the development of public transportation, address opportunities to connect/cross-connect systems, and support and increase bicycle access.

Action: Integrate and encourage utilization of public transportation. Follow the recommendations of the NYC Department of City Planning (DCP) 1999 Bicycle Parking Needs Study and the 1997 NYC Bicycle Master Plan. Reduce parking from pre 9/11 levels and implement Parking Management Plan to reduce future parking demands. Site parking for commercial uses is not to exceed 1300 cars.

Towers: Support bicycle use by providing bicycle racks or secure and convenient storage.

Site: Support bicycle use by providing bicycle racks near transportation, retail and cultural centers.

UEQ-3: Regional Mass Transit

Purpose: To promote regional mass transit systems.

Action: Provide inter-modal connection facilities for regional trains, ferries, subways and buses with clear connections between the various transportation systems. Allow for future integration of other regional transportation systems.

UEQ-4: Pedestrian Movement

Purpose: Support neighborhood, community, visitor, and commuter pedestrian pathways and facilitate pedestrian access to and through the site.

Action: Diagram anticipated pedestrian pathways that are coordinated with plans for the WTC Redevelopment Projects. Enhance pedestrian pathways, both above and below ground, to facilitate and support pedestrian traffic. Describe enhancements including and illustrating connections to buildings, additional pathways and transportation nodes, path size, adjacent area uses, public art, vegetation, access to daylight and direct sun, furnishings, wayfinding, paving materials, and patterns and view corridors.

UEQ-5: Green Infrastructure

Purpose: Support the development of green infrastructure by developing and linking vegetated site areas with existing neighborhood green spaces.

Action: Diagram "green" infrastructure within 1000 feet of site boundary. Create site vegetated areas to enhance site contributions to natural ecological processes, sustain air and water resources, promote biodiversity, and reduce heat island effects. Facilitate creation of green infrastructure linkages in conjunction with adjacent neighborhood green spaces.

UEQ-6: Outdoor Environmental Comfort

Purpose: To facilitate site development that supports outdoor environmental comfort.

Action: Design site structures, materials, and landscape to enhance comfort and functionality of outdoor spaces and to mitigate the effects of heat islands. Extend outdoor comfort levels further into the Spring and Fall seasons with passive strategies that maximize natural assets. Design structures with consideration for site environmental wind conditions where pedestrians would be affected and seek to moderate any such effects.

UEQ-7: Wayfinding

Purpose: To facilitate both neighborhood and site-user orientation and site readability.

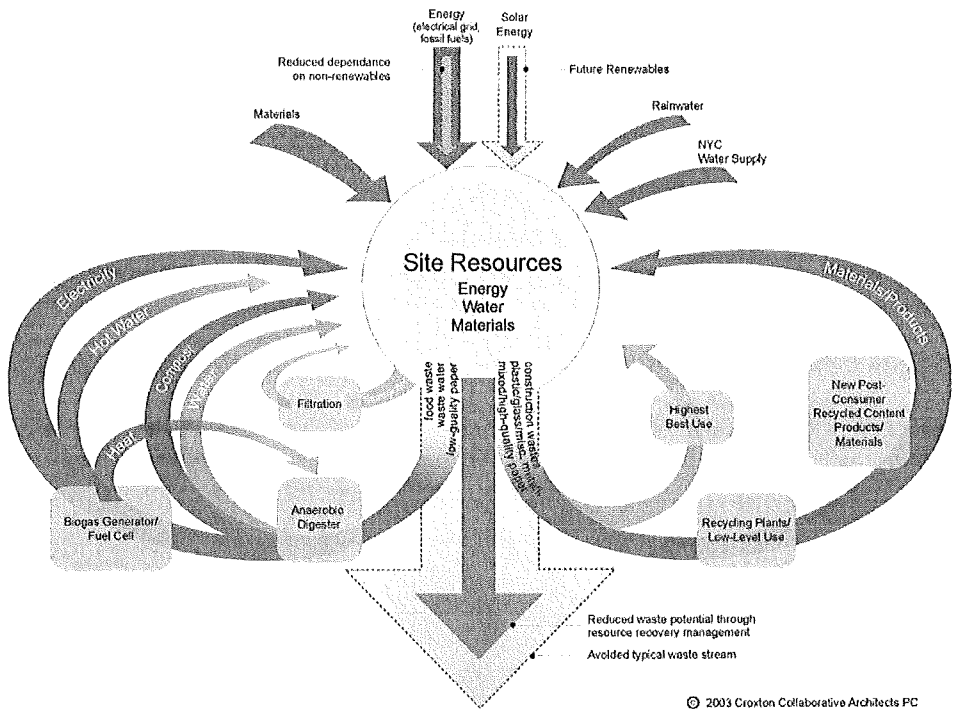
Action: Integrate wayfinding as an integral design quality when developing green corridors, visual corridors and memorable place markers in conjunction with surrounding neighborhoods.

UEQ-8: Vehicular Emissions

Purpose: Reduce back-up of traffic into neighboring streets in order to minimize vehicle emissions and improve neighborhood air quality from pre 9/11 base. Minimize potential idling time for all vehicles.

Action: Optimize traffic flow of all vehicles coming to the site to reduce the amount of time that vehicles must idle. Seek to reduce traffic backups through scheduling and on-site accommodation. Design bus stops to minimize traffic backups and potential vehicle idling times.

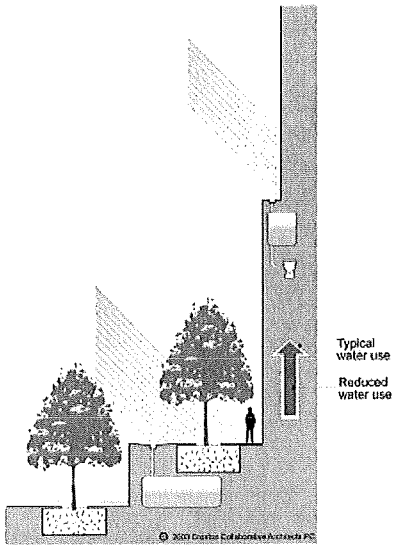
To the extent that there is NY State Agency and/or other governmental presence on site, 50% of light duty fleet vehicles will be alternative fuel or hybrid vehicles by 2005 and 100% by 2010.



SEQ-1: Comprehensive Resource Management Plan

Purpose: Draft and implement the requirements of the Comprehensive Resource Management Plan.

Action: The Comprehensive Resource Management Plan provides a tool for an integrated consideration of water, material and energy resources with the goal of identifying, evaluating and optimizing utilization of all resources on the site. The plan overlays information from the individual water, material and energy management plans and identifies integrated opportunities for resource conservation (i.e. high capture and utilization of stormwater at upper levels of tower reduces pump energy required for lifting equivalent amount of water).



Stormwater Recovery

SEQ-2: Storm Water Use

Purpose: To capture and utilize site stormwater flows, thereby reducing storm water volume and surges through the system.

Action: Implement a plan for stormwater management as part of the Water Management Plan that reduces the post-development flow of stormwater from the site (9/11 base). Construct treatment systems to remove 80% of total suspended solids (TSS) and 40% of total phosphorous (TP) per EPA Document (840-B-93-001c) Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters (based on the average annual loadings

from all storms less than or equal to the 2 year/24 hour storm).

Site/Parcel: Design site surfaces to allow collection of site storm water flows from other than street surfaces. Provide storage and filtration infrastructure. Fully use captured water as appropriate and in conjunction with Water Management Plan.

Towers: Consider towers with ledges, roofs and setbacks, which will assist in capturing water sheeting off buildings at high elevations to capture potential energy of water and reduce water pump energy requirements. Provide storage and filtration infrastructure near point of capture. Use water, as appropriate, for toilet flushing and as part of building water systems.

SEQ-3: Heat Island Effect Mitigation

Purpose: Reduce site development contributions to "heat island" effects in Lower Manhattan. Seek to maximize areas of landscape planting (green infrastructure) coupled with high albedo surfaces at other areas to mitigate thermal loading of site surfaces and building roofs.

Action: Provide green infrastructure coupled with high albedo surfaces to mitigate thermal loading of site surfaces and building roofs.

Site/Parcel: Provide shade and/or use light-colored/high-albedo materials (reflectance of at least 0.3) or open reinforced grid pavement for at least 30% of the site's walkways, plazas, and open spaces.

Tower: Use ENERGY STAR® compliant AND high emissivity roofing (emissivity of at least 0.9 when tested in accordance with ASTM 408) for a minimum of 75% of the roof surface; OR install a "green" (vegetated) roof for at least 50% of the roof area. Combinations of high albedo and vegetated roof can be used providing they collectively cover 75% of the roof area.

SEQ-4: Light Pollution Reduction

Purpose: To reduce light pollution to surrounding sites and night sky.

Action: Satisfy Illuminating Engineering Society of North America (IESNA) recommended practice per manual (RP-33-99) for exterior illumination. Design exterior lighting such that all exterior luminaires with more than 1000 initial lamp lumens are shielded and all luminaires with more than 3500 initial lamp lumens meet the Full Cutoff IESNA Classification. The maximum candela value of all interior lighting shall fall within the building (not out through windows) and the maximum candela value of all exterior lighting shall fall within the property. Tower tops will not be constrained by these requirements. Minimize glare from reflected sunlight by minimizing use of highly reflective materials on building facades. Incorporate lighting controls to minimize energy use during unnecessary periods.

SEQ-5: Construction Environment

Purpose: To reduce pollution, noise, and vibration from construction activities and vehicles.

Action: Implement a Construction Environment Plan, which reduces pollution, noise and vibration from construction activities and vehicles to adjoining neighborhoods.

Develop a materials staging and construction access plan prior to start of construction. Truck staging zones are to be placed for minimum disruption and impact. Limit unnecessary idling times on diesel powered engines to 3 minutes. Consider bio-diesel fuel as an alternative to pure diesel.

Non-road construction equipment of 50hp or greater to include diesel emissions control technology according to EPA diesel retrofit recommendations, unless not technically feasible. All non-road diesel equipment to utilize ultra low sulfur diesel fuel (limit sulfur levels to 15ppm). Explore accelerated implementation of proposed EPA emission standards for non-road diesel equipment. Locate fixed diesel powered exhausts away from fresh air intakes.

Reduce noise and vibration impacts through scheduling and coordination with adjacent construction activities. Consider noise barriers where practicable.

Consider condition of surrounding buildings, structures, infrastructure and utilities where appropriate. Coordinate construction activities in adjacent and nearby locations to avoid or minimize impacts and communicate plans with the public.

Prepare contingency measures in the event established limits are exceeded.

SEQ-6: Construction Storm Water Runoff and Pollution Prevention

Purpose: Control site erosion and reduce negative impacts on hydrological and atmospheric systems produced by construction activities.

Action: Provide Construction Storm Water Pollution Prevention Plan conforming to US EPA document 832/R-92-005. Prevent air pollution from dust and particulate matter during the course of construction. Utilize sprayed suppressing agents (nonhazardous, biodegradeable) for containment of fugitive dust and adjust strategies per meteorological conditions. Coordinate with SEQ-5 Construction Environment Plan.

SEQ-7: Use Existing Site Structures

Purpose: Encourage the re-use of existing site structures to conserve resources.

Action: Incorporate existing slurry wall, bathtub excavation, elements of Temporary PATH Station, and utilities (such as the River Water Pump Station) for re-use in new site development to the extent possible.

SEQ-8: Plant/Vegetation Selection

Purpose: Use indigenous or acclimatized plants to reduce irrigation and maintenance requirements.

Action: Specify naturalized or indigenous plant materials, which will promote biodiversity and support site ecological systems, as well as reduce maintenance requirements. Use plantings that can be sustained by natural rainfall levels to reduce irrigation requirements.

SEQ-9: Daylight/Exterior Public Spaces

Purpose: Design buildings and site structures to consider available daylight for public open spaces and green areas (within the context of the established massing guidelines).

Action: Determine critical open spaces and green areas. Utilize shadow studies to determine available sunlight. Consider available sunlight in planning outdoor public spaces and site plantings.

SEQ-10: Solar Access/Harvesting

Purpose: To optimize solar access for utilization of solar energy.

Action: Determine maximum available photovoltaic potentials for all building surfaces. Develop strategy for possible future transition to capture this potential. Quantify and document this strategy and any other "near threshold" renewable technologies in the Renewable Energy Transition Plan.

SEQ-11: Recovery of Resources

Purpose: To optimize utilization of site material resources and to facilitate the reduction of waste generated by building occupants that would otherwise be hauled to and disposed of in landfills and/or incinerators.

Action: Study large-scale and small-scale opportunities for on-site recovery of waste. Consider opportunities to recover food, paper, plastic, metal, and construction waste. Consider composting, biomethanization, and other viable "waste to reuse" strategies. Consider in conjunction with Renewable Energy Transition Plan and Co-generation Study.

SEQ-12: Use of Undeveloped Parcels

Purpose: Utilize inactive and undeveloped site parcels to provide a positive contribution to site environmental qualities.

Action: Address both the "active" portions of the site under development, as well as the "inactive" areas of the site, which have a supporting role. Apply guidelines Storm Water Use (SEQ-2) and Heat Island Effect Mitigation (SEQ-3) to "inactive" site areas.

8.3.3 Water Environmental Qualities

WEQ-1: Comprehensive Water Management Plan

Purpose: To optimize utilization of site water resources.

Action: Implement a Water Management Plan to evaluate use of storm water, waste water, and potable water resources, study potentials for onsite reclamation of wastewater and provide a coordinated management plan for full site water resources.

Use EPA recommendations per EO 12123 (June 1999) and Federal Energy Management Program (FEMP) Best Management Practices to develop Plan. The Plan must include, at a minimum, information on operation & maintenance, utility information, facility information, emergency response information and planning considerations.

WEQ-2: Wastewater Reuse

Purpose: To minimize site wastewater outflows.

Action: Implement wastewater strategies as required by Water Management Plan. Use reclaimed storm water and/or site water for toilet flushing, cooling tower makeup, vehicle maintenance, and irrigation needs. Study additional opportunities to reduce the amount of potable water used in the building for conveying sewage.

WEQ-3: Water Use Efficiency

Purpose: To maximize water efficiency within buildings and reduce the burden on municipal water systems.

Action: Reduce consumption of potable water as required by Water Management Plan. Use 30% less potable water than a baseline building (utilize 1992 Energy Policy Act fixture requirements to determine baseline) would by utilizing efficient water fixtures, automatic controls, and/or waterless urinals.

WEQ-4: Landscape Hydrology

Purpose: To maximize utilization of site water for landscape requirements.

Action: Use storm water for landscape irrigation requirements in conjunction with Water Management Plan. Specify plantings requiring low amounts of watering. Use indigenous or acclimatized plants suitable for the current nature of the site. Employ high-efficiency irrigation systems with slow-drip, sub-soil irrigation and computer operation with linkages to meteorological data to optimize water resources.

EEQ-1: Comprehensive Energy Management Plan

Purpose: To conserve and optimize building energy use and minimize air emissions, including greenhouse gases, associated with energy consumption at the site.

Action: Prepare an Energy Management Plan to conserve and optimize building energy use, minimize air emissions and coordinate and maximize the utilization of any site generated energy resources. The Plan shall include an energy use budget for the project for the first year of operation (building shall be a minimum of 50% occupied with unoccupied areas and building systems normalized for full occupancy) and broken down by major energy consumption category (i.e. heating, cooling, lighting, fan energy, pump energy, etc.). Consider base building systems apart from occupancy with allowances for interconnections. After each year of operation, the actual utilization of energy shall be recorded and compared to this baseline energy use budget with appropriate adjustments for deviations in occupancy, base building conditions and climate norms. Significant deviations shall be evaluated and a detailed explanation for the probable cause of the deviation recorded in the updated plan. Strategies for reducing energy consumption below the first year of operation, as defined above, shall be identified and described.

The Energy Management Plan shall include a similar itemization of any site generated energy resources, including a budget for each component, and annual updates of actual performance. The Plan shall identify measures and strategies for increasing utilization of clean on-site energy above the first year of operation, as defined above.

Review opportunities for coordinated site strategies to conserve energy. Provide matrix outlining additional costs and savings, available incentives, benefits and impacts from, for instance, a co-generation plant, river water cooling, building integrated PV, fuel cells, and other strategies.

EEQ-2: Building Systems Commissioning

Purpose: To implement a Building Commissioning Plan.

Action: Engage an independent commissioning authority to prepare and execute a commissioning plan. Implement fundamental, best practice building commissioning procedures. Include design phase reviews, contractor submittal reviews, pre-functional and functional testing (including seasonal testing), training, Operations & Maintenance manuals and post occupancy review. Provide Building Commissioning Plan consistent with the requirements of NY State Building Tax Credit (NYSGBTC) 638.8.

EEQ-3: Optimize Energy Performance

Purpose: To optimize the performance of building energy systems.

Action: Optimize the performance of building energy systems through the utilization of a full DOE-2.1E or Energy Plus building energy model to compare alternative strategies for energy efficiency (kwh) peak load reduction (kW) and reduced use of fossil fuels. Integrate with Energy Management Plan. This is to include the full analysis of architectural and mechanical decisions in relationship to building energy expenditures. Achieve a minimum of 20% decrease in energy cost above ASHRAE 90.1-1999. This savings reflects both tower and office tenant build-out potentials. Tenant build-out potential (as demonstrated in a typical tenant build-out) will be modeled in the same integrated exercise and the economic results provided to potential tenants in support of the preferred buildout. Include full list of energy conserving opportunities available to tenants.

Provide daylight dimming and occupancy sensors on light fixtures where appropriate. All light fixtures to use high efficiency ballasts and low mercury/low lead, long life lamps. Specify recyclable lamps. Utilize energy efficient equipment such as variable speed systems for fans, pumps and motors; motors that meet or exceed NEMA premium efficiency ratings and equipment that meets or exceeds ENERGY STAR® ratings. Comply with FEMP levels for commercial products not rated by ENERGY STAR®. Provide a high performance building envelope, including minimized thermal bridging, superior insulation, air infiltration barrier and insulated wavelength selective glazing (to improve daylight transmission). Provide envelope construction details consistent with NYSGBTC 638.7(d)(2). Use air-side and water-side economizers, as appropriate.

EEQ-4: Ozone Layer Protection

Purpose: To reduce emission of ozone depleting chemicals.

Action: Specify building HVAC systems with zero levels of CFC refrigerants, and provide plan for future elimination of HCFC's and halon in HVAC and refrigeration equipment and fire suppression systems. Avoid insulation materials that utilize chlorine based gases.

EEQ-5: Renewable Energy Plan

Purpose: To meet a portion of site energy requirements with on site and/or purchased renewable energy sources and institute a plan for transition as renewables become more cost-effective.

Action: Utilize site generated and/or purchased renewable energy for a percentage of total building energy use. Provide transition plan for future conversion to renewables. Purchase or generate on-site a minimum of 20% of overall annual electric energy requirements with renewables by 2010 consistent with NY State EO-111's evolving requirements and capabilities. Provide infrastructure to integrate technology into building systems, when possible.

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EEQ-6: Energy Systems Control and Maintenance

Purpose: To provide for ongoing verification of initial operation and energy utilization of building energy systems.

Action: Provide a computerized, fully-integrated Building Management System (BMS) with energy and fluid flow measurement capabilities for all major energy consuming systems. Institute a maintenance plan for ongoing measurement, verification and maintenance of equipment efficiencies and resource utilization. Provide programmable controls. Install permanent monitoring systems to track energy performance. Provide for maintenance and operational continuity through manuals and education. Install continuous metering equipment for a representative sample of lighting systems, motors, drives, chiller efficiencies, and trending of economizer and heat recovery equipment cycles, air distribution pressures and volumes and boiler efficiencies. Integrate the above systems into the Building Commissioning Plan.

EEQ-7: End User Metering

Purpose: Maximize tenant incentives to conserve energy.

Action: Include electrical distribution infrastructure required to allow end-user metering of tenants, including electricity use (kWh) and demand (kW) metering. Provide examples of existing incentive programs to tenants.

Material Environmental Qualities 8.3.5

MEQ-1: Comprehensive Material Management Plan

Purpose: To optimize utilization of site material resources and to facilitate the reduction of waste generated by building occupants that would otherwise be hauled to and disposed of in landfills and/or incinerators.

Action: Implement a Materials Management Plan, which coordinates and implements material guideline requirements within the Sustainable Design Guidelines. Describe materials utilized, recycled content, location of manufacture/harvest, agricultural content, sustainable harvest certification, expected lifetime, maintenance requirements and recyclable/reuse potential at end of useful life. Minimize travel distance for building products and systems and locate sinks for highest recycled use for 'waste' materials in conjunction with MEQ-2 and MEQ-5. Provide infrastructure necessary to implement the recycling requirements of the plan. A central location for appropriately-sized recycling facilities must be provided for all buildings. Facilities must include, at a minimum, space for the separation, collection and storage for recycling of paper, corrugated cardboard, glass, plastics and metals, and each of these areas should be clearly identified. Provide easy truck access for the pick-up and removal of recyclables.

MEQ-2: Construction Waste Management

Purpose: To reduce the amount of construction and demolition (C&D) waste going to landfills and/or incinerators and to conserve resources through reuse and recycling.

Action: Implement a Construction Waste Management Plan to divert construction, demolition and land clearing debris from landfill disposal to redirect recyclable and/or recovered resources back to the manufacturing process and to redirect salvageable materials to appropriate sites. Recycle and/or salvage a minimum of 50% of construction, demolition and land clearing waste, calculated by weight. Divert a minimum of 50% of construction waste by weight from landfill.

MEQ-3: Resource Reuse

Purpose: To incorporate previously used building materials and products into new construction.

Action: In coordination with the Materials Management Plan consider the use of salvaged, refurbished or reused materials and products in the building. Materials for reuse typically include reclaimed lumber and wood such as salvaged wood flooring and wood doors and cabinets, structural metal work such as beams, and miscellaneous metal such as doors, door hardware, etc. Decorative and specialized items such as salvaged wood and glass panels, banquettes, front and back bars and decorative or period lighting fixtures may be used in special public locations such as cafeterias or restaurants, and can contribute to this credit.

MEQ-4: Materials with Recycled Content

Purpose: To incorporate materials with recycled content and increase market demand for building materials and products that incorporate recycled content.

Action: Specify materials with recycled-content in conjunction with the Materials Management Plan. The value of the recycled content portion of materials is to be at least 10% of the total project materials value (mechanical and electrical components are not to be included in these calculations).

Determine recycled content value according to the following formula. For post-consumer recycled content determine percentage of recycled content in the material and multiply by value of material. For post-industrial recycled content determine percentage of recycled content in the material, multiply by ½ and multiply by value of the material.

MEQ-5: Material Proximity

Purpose: To reduce environmental degradation resulting from transportation impacts by increasing the demand for building materials and products that are extracted and/or manufactured in close proximity to the building site.

Action: Utilize local/regional materials in conjunction with the Materials Management Plan. Use a minimum of 20% of all building materials (based on cost) that are manufactured within a 500 mile radius of the site. Manufactured in this context means the location where "final assembly" takes place.

MEQ-6: Wood Certification

Purpose: To specify wood which has been harvested according to sustainable forest management principles.

Action: Utilize wood materials certified under the Forest Stewardship Council's Principles and Criteria (FSC) in conjunction with the Materials Management Plan. These materials may include dimensional framing components, flooring, doors, paneling, millwork and furnishings, handrails and trim, etc., as well as, temporary lumber and wood construction materials. Request vendor's chain-of-custody certificate number to verify certification.

MEQ-7: Agricultural Materials

Purpose: To encourage the specification of materials which are renewable and that grow in such a way as to support biological diversity and the health of the ecosystem.

Action: In coordination with the Materials Management Plan use renewable and rapidly renewable building materials and products. Materials with annual growing cycles or which regenerate naturally within a 10-year-cycle are considered to be rapidly renewable materials. These materials include bamboo, poplar, cork, wool, cotton, jute, sisal, and soy-based products. Agricultural 'waste' materials such as wheatgrass, sunflower seed husks, and straw also qualify under this category. Release agents for concrete forms, which are made from plant oils such as corn oil are included. Use agricultural compost for site applications, including, but not limited to, turf, plantings and erosion control.

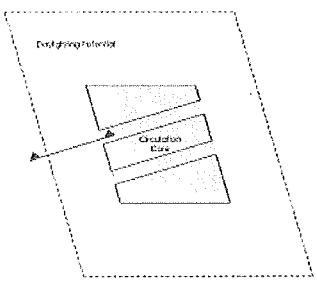
8.3.6 Indoor Environment Qualities

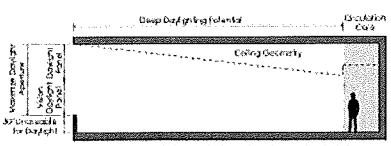
IEQ-1: IAQ Performance

Purpose: Establish high indoor air quality (IAQ) for the comfort and well-being of the building's occupants by minimizing the potential for poor air quality, and by establishing minimum IAQ performance and standards.

Action: Provide an Indoor Air Quality Management Plan which employs architectural and HVAC design strategies to establish minimum outdoor air quantities, chemical, biological and particulate source control and on-going air quality monitoring to achieve a positive impact on the overall indoor environment and well being of the occupants. Meet the requirements of ASHRAE Standard 62-2001: "Ventilation for Acceptable Indoor Air Quality", utilizing the Ventilation Rate Procedure.

Prepare plan in accordance with the requirements of NYSGBTC 638.7(d)(1,2 and 3). Draft the plan in accordance with the EPA "Building Air Quality: A Guide for Building Owners and Facility Managers", 1991 and EPA and National Institute for Occupational Safety and Health, Building Air Quality Action Plan, 1998.





Office floor plate optimized for deep daylighting

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IEQ-2: Daylight & Views

Purpose: Provide building occupants with connections to the outdoors through the introduction of daylight into habitually occupied areas of the building. Provide building occupants with views via direct line of sight to the outdoors from regularly occupied spaces when possible.

Action: Towers: Provide a 2% minimum daylighting factor to 75% of regularly occupied tenant spaces. Build a tenant office fit-out (5,000 SF) to demonstrate optimum daylight access, louvers and glare controls, and ceiling geometries intended to optimize daylighting strategies. Quantify performance of integrated curtain wall and tenant fit-out with proposed savings

Retail: Seek to maximize daylight penetration to concourse areas and below grade retail areas. Provide views to the outdoors from concourse areas to assist users in wayfinding and orientation.

IEQ-3: Air Quality Monitoring

Purpose: To retain high indoor air quality standards by establishing monitoring protocols to assist in maintaining appropriate ventilation rates for the comfort and well-being of building occupants.

Action: Indoor air quality must be tested annually and must meet minimum criteria for five years in accordance with minimum requirements of NY State EO-111reference to NYSGBTC 638.7(d)(1). Once radon measurements are found to be

satisfactory, subsequent testing for this contaminant is not required. Where concentration levels of noted contaminants exceed the established parameters in any specific area during this 5 year period, seek to locate and remediate/eliminate contaminants, then flush out area with 100% outside air for a minimum of one week and retest until a satisfactory result is achieved.

Consideration should be given to a permanent indoor air quality monitoring system with centralized controls that provides feedback on ventilation performance and contaminant concentrations based on a combined carbon monoxide, carbon dioxide and volatile organic compound monitor.

IEQ-4: Ventilation Air Quality

Purpose: To provide outside air to all occupied spaces in the building to support the comfort and well-being of building occupants and as an energy conservation measure.

Action: Demonstrate that the requirements of Section 5, 'Best Practices for Maintaining IEQ' of the International Performance Measurement & Verification Protocol, Volume II 'Concepts and Practices for Improved Indoor Environmental Quality', March 2002 have been met. Provide capability for system default to 100% outside air at all times where practicable and in balance with energy conservation.

IEQ-5: Construction IAQ Management Plan

Purpose: To provide minimum standards for the air quality of building areas upon occupancy.

Action: Implement a Construction Indoor Air Quality Management Plan in conformance with NY State EO-111reference to NYSGBTC 638.7(d)(2) and the USGBC LEED 2.1 Rating System. During construction, meet or exceed the recommended Design Approach of the Sheet Metal and Air Conditioning National Contractors Association (SMACNA) IAQ Guideline for Occupied Buildings under Construction, Chapter 3. Use high efficiency filtration media at all HVAC return air grilles during construction and replace all base building mechanical system filtration media with Minimum Efficiency Reporting Value of 13 (MERV 13) filters in accordance with ASHRAE 52.2 – 1999 immediately prior to occupancy.

On completion of construction and prior to occupancy, conduct a two-week flush out with new filtration media using 100% outside air, in accordance with NYSGBTC 638.7(d)2. Replace all filtration media used with new MERV 13 filters. Alternatively, test indoor air quality at random sampling points for every 20,000 sf, or by each floor if smaller, in accordance with recognized national

standards, to achieve an air quality profile at time of occupancy which satisfies the specific minimums for carbon dioxide, carbon monoxide, formaldehyde, volatile organic compounds, particulates and radon as per NY State EO-111reference to NYSGBTC 638.7(d)(2) and include one additional testing procedure for 4-PCh to satisfy all of the Alternate Procedure Requirements for LEED 2.1. Where concentration levels of contaminants exceed the established parameters in any specific area, flush out area with 100% outside air for a minimum of two weeks and retest until a satisfactory result is achieved.

IEQ-6: Reduce Contaminants from Materials

Purpose: To reduce the density of contaminants that are emitted by common building materials and which affect the comfort and well-being of building occupants.

Action: Develop and implement a Materials Management Plan to minimize utilization of materials with high levels of volatile organic compounds (VOC's) and other toxic characteristics which adversely affect Indoor Air Quality (IAQ). VOC's must meet or be lower than those in the following standards:

- Adhesives and sealants: South Coast Air Quality Management District Rule #1168
- Paints and coatings: Green Seal Standard GS-11
- Carpet and carpet adhesives: Carpet and Rug Institute Green Label Indoor Air Quality Test Program

Where possible use non-urea-formaldehyde-based bonding agents in composite wood and typical millwork applications such as veneer and plastic laminate applications, etc.

Minimize unprotected insulation in ducts, supply plenums and return plenums per NYSGBTC 638.7(j).

IEQ-7: Chemical & Particulate Control

Purpose: To minimize sources of chemical and particulate air contamination.

Action: Design all major entrances with permanent walk-off grilles to minimize particulate transfer. Provide MERV 13 air filters for removal of 90% of particulates at air supply systems and provide building owner with a maintenance schedule for filter replacement. Build slab-to-slab partitions and provide negative air pressure of at least 7PA with isolated exhaust systems of at least .5cfm/sf at work rooms with printing and copying equipment, janitorial closets and all chemical use areas. Locate exhausts to ensure that there is no potential for re-entrainment of exhaust air to other supply in-takes. Provide drains for appropriate disposal of liquid waste in spaces where water and chemical concentrate mixing occurs.

IEQ-8: Thermal Comfort

Purpose: To provide building users with a high level of thermal comfort to promote comfort, well-being, and enhanced productivity.

Action: Design the building envelope in accordance with ASHRAE Standard 55-2004 to manage the flow of air, moisture and thermal energy in the building. Include capability for adjustments to thermal conditions to address seasonal changes and associated modifications in typical levels of clothing. Design an integrated system (thermal shell and HVAC) that allows building operators to monitor and control air temperature in each zone. To avoid condensation problems, mechanical systems must be designed to deal with part-load cooling conditions so that they are able to maintain appropriate dehumidification levels.

IEQ-9: Pest Control

Purpose: To mitigate health concerns caused by any unwanted pests, their excrement, and the chemicals used to control them.

Action: Develop an Integrated Pest Management Plan based on USEPA Best Management Practices, which promotes physical controls and non-pesticide measures over pesticide application. Physical controls include building sealing strategies, improved sanitation, pest-resistant plantings and improved maintenance of wet areas. When necessary, use boric acid or other nontoxic alternatives in lieu of more toxic chemicals to control and eliminate rodent populations from building.

IEQ-10: Occupant Control

Purpose: To provide building occupants with a high level of thermal, ventilation and lighting system control to promote productivity, comfort and well-being.

Action: Provide building occupants with controls over airflow, temperature and lighting systems including individual controls where practicable or feasible. Provide operable windows where practicable and feasible.

IEQ-11: Acoustics

Purpose: Minimize vibration and noise levels in indoor spaces and at exterior environments to achieve appropriate physical comfort and sound isolation for tasks and speech intelligibility, while contributing to human well-being and productivity.

Action: Where practical program locations of mechanical equipment and other sources of noise away from areas of building and exterior spaces designed for use by building tenants and the public. Design separations to minimize transfer of noise. Consider strategies to reduce the transmission of exterior ambient noise.

Comply with the recommendations of ASHRAE Applications Chapter 46 Design Guidelines to reduce potential noise and vibration from mechanical equipment, and the Architectural Graphic Standards 8th Edition: Sound Isolation Criteria Table, page 44 to address acoustic criteria for enclosed office space such as offices, meeting rooms and other occupied areas.

IEQ-12: Lighting Quality

Purpose: Employ advanced lighting design to maximize comfort and productivity of building occupants and enhance the quality and efficiency of electric lighting. Fully coordinate ambient electrical lighting design with daylighting strategies.

Action: Design an ambient electrical lighting system that is coordinated with daylighting strategies to provide flexible illumination. Endeavor to meet the recommendations of the Illuminating Engineering Society of North America's (IESNA) 9th Edition Handbook, Chapter 10 Quality of the Visual Environment, and the Lighting Design Guide. Provide high frequency electronic ballasts, recyclable lamps and low mercury/low lead lamps as defined by the US Environmental Protection Agency's Toxicity Characteristic Leaching Procedure (TCLP) testing procedure. Supplement ambient lighting system with multi-level task lighting to maintain a minimum of 35 footcandles (in typical office area) at desk level throughout hours of occupancy.

8.4 Alternative Compliance Path

Compliance with the SDG's for the site for a specific project and or building will be considered satisfied by implementing the requirements of the Sustainable Design Guidelines (SDG's) as indicated above, or by an Alternative Compliance Path which consists of the following requirements:

- Implement the LEED Rating system at the Gold level and achieve formal certification from the US Green Building Council. For commercial office projects, the LEED-CS system (Core & Shell) may be utilized.
- Implement construction equipment pollution control measures as identi fied in SEQ-5: Low sulfur diesel, Catalytic Converters, Particulate Filters.
- Achieve Net-Zero CO2 for all base building electricity consumption (via commercially purchased Wind Certificates for 100% of purchased elec tricity).
- Reduce Whole Building energy consumption 20% below NY State En ergy Code requirements, as defined in EEQ-3.
- Satisfy EO-111 requirements for indoor air quality monitoring, commis sioning and air quality management, as defined in IEQ-3.
- For each commercial office building that implements LEED-CS, construct a 1,500 sq.ft. exemplar space as the means of demonstrating confor mance with EO-111 requirement for performance of tenant interior fitout.
- Create and execute the following resource management plans, as identi fied in Article 8.1:
    - Construction Storm Water Pollution Prevention Plan (SEQ-6)
    - Construction Waste Management Plan (MEQ-2)
    - Indoor Air Quality Management Plan (IEQ-1)

Signage Guidelines 9

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9.1 Introduction

Environmental graphics and signage for the World Trade Center site require a visionary approach. From the use of names and nomenclature to the selection of typefaces and colors, each and every design decision must be carefully considered and thoughtfully reached in the context of the site as a whole.

The Signage Guidelines offer a framework for this decision making. They are intended to result in a harmonious and inspiring experience from the point of view of the user, whether it be the business commuter of today or the international tourist of tomorrow. Primarily as a user benefit, the signage is intended to provide information that simplifies, clarifies and enhances the user's visit to the World Trade Center site.

Through sound analysis, good planning and appropriate levels of consistency, the signage design at the World Trade Center site can create unified sense of place and leverage economies of scale in production and fabrication. A uniform signage program will give the World Trade Center site a unique identity and, in doing so, will knit together the many different program elements found on the site.

The end result should be a smart, attractive program that contributes to the WTC user and visitor experience and sets the standard for signage in the twenty-first century.

To achieve design integrity, these signage guidelines suggest the development of a "kit-of-parts" that contains a range of flexible, functional and complementary communication tools, and reasonable standards for their size, materials, placement, and other specifications.

The scale and complexity of the site's public spaces call for signage systems that include both dynamic and static components; accommodate both public information and promotional messages; and provide guest service and branding functions on an appropriate level. As such, signage will be an important link between the architectural environment and human behavior, helping people orient themselves, get where they want to go, and learn what they need to know, when they need to know it.

Fixed identification signs, directional signs, and safety and security messages will need to be visible, distinctive and durable, yet work in tandem with temporary information such as service and schedule notices. These graphics

must also be distinguishable from PATH, MTA and commercial tenants' branding and serve their function within a potentially cluttered visual environment. The use of symbols, electronic displays and other media may be considered to complement the fixed, text-based communications, and to help overcome language and other physical and perceptual barriers.

OVERALL SIGNAGE GOALS

There are several keys goals that should inform the development of the WTC signage.

- Create spaces and places linked by a common signage thread that assimilate into a series of memorable experiences.
- Clearly identify the WTC as a single location/place and establish a common set of standards for the benefit of all stakeholders and tenants.
- Create a modern, elegant and sophisticated atmosphere that clearly conveys the individual identities of the stakeholders and tenants by employing simple, strong and legible design elements.
- Display and contribute to the perception of the WTC as a vibrant yet respectful place to visit.
- Present clear, concise information where and when users need it by using consistent messaging, logical naming, meaningful symbols, icons and logos.
- Design signs that are architecturally enhancing and compatible with their environment.
- Use cutting-edge, state of the art technology.
- Design a system that links adjacent destinations.
- Do not create distracting images, such as flashing signs or moving images.

9.2 Goals and Recommendations

9.2.1 Overview

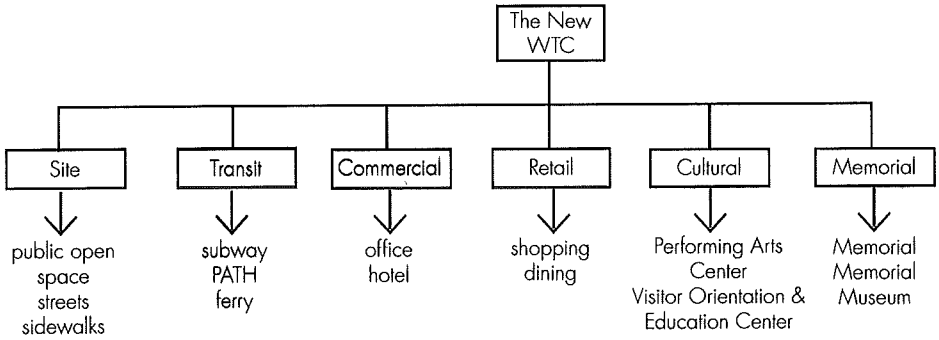
USERS

The new WTC site will be characterized by its many different amenities and populated by a wide variety of users. The people coming through this site will be there for any number of reasons, and possibly engage in more than one activity, for example:

- Memorial Visitor – shop – eat – visit memorial
- Transit Rider – transit – shop – eat
- Office Worker – transit – eat – shop – work
- Resident – recreation – transit – shop
- Cultural Visitor – culture – eat – shop
- Hotel Guest – eat – visit memorial – shop – transit – work
- Tourist – shop – eat

WAYFINDING EXPERIENCE

Signs play a major part in securing a user-friendly and cohesive experience for each of these user groups. The new WTC site will be physically integrated into the fabric of Lower Manhattan, therefore, identification signs need to help mark the transition between WTC and non-WTC buildings and public areas. As users enter the site, signs need to inform them about the different functions of the site and direct them from one to the other. Signs should consistently present and make a distinction between the different functions of the complex (transit, commercial, retail, memorial and cultural) and establish "paths" for the different users.



Following are further recommendations and guidelines per sign type. With the help of these recommendations, a meaningful and useful wayfinding and information signage system will be developed at the new World Trade Center.

COMPONENTS

Wayfinding and information systems provide the threads that carry people from all backgrounds, languages, and with varying destinations through a particular space. The system's success is based on its ability to communicate with the broadest audience and offer them a seamless wayfinding experience.

These are the functional elements that make up such a system:
Placemaking
Identification
Orientation
Direction
Information
Interpretation
Retail

Listed below are terms that will be used throughout this chapter:

SIGN: Any writing (including letter, word, or numeral), pictorial representation (including illustrations or decoration), emblem (including device, symbol or trademark), flag (including banner or pennant) or any other figure of similar character that is permanently affixed and used to advertise or identify a business via name or logo, the face of which shall not project more than 8" from the mounted surface.

SECONDARY SIGNAGE: Signage located at pedestrian level at or below eye site. They may occur in the lower 1/2 of the store façade. They should be 2-dimensional, applied directly to the glass or flush with the glass. It shall not be illuminated. These signs shall be the store name and/or logo only.

ILLUMINATED SIGN: A sign lighted by or exposed to artificial lighting either by lights on or in the sign or directed toward the sign.

HALO EFFECT: Backlit sign that incorporates internal illumination to create a glow effect against the back wall surface.

FLASHING SIGN: Any directly or indirectly illuminated , whether stationary, revolving or rotating, that exhibits changing artificial light or color effects by any means whatsoever.

DYNAMIC SIGN or ELECTRONIC SIGN: A general term used for signs that can be changed manually or electronically by an electronic device. Some of these require manual programming.

LED (Light Emitting Diode): Series of light panels that incorporate a 4-color system to create an image. They are programmed via computer systems with manual input. This results in a pixilated image.

LCD (Liquid Crystal Display) TELEVISION MONITOR: Receives

signals via computer or cable. Image is clear and continuous.
PLASMA DISPLAYS: Similar to LCD technology, can be projected on a flat screen.
FIBER OPTICS: A strand of light transmitting fibers used to illuminate from the back, side or front of signs.

9.2.2 Placemaking

The act of placemaking requires clearly defining the WTC's role within Lower Manhattan. Environmental graphics play a crucial role in building the character and sense of place. The foundation of this character is established by the architecture, and complemented by landscape/streetscape design, interior design, and lighting.

The WTC site will serve as a major access point to transportation systems and destinations in Lower Manhattan. Its function as a major transportation, cultural and commercial destination for the City of New York is equivalent to that of Penn Station or Grand Central Station, therefore branding this site must take into consideration all the various user functions and constituencies.

Placemaking Goals

- Design a family of wayfinding and environmental signs to unify the WTC Site under one identity and style, define its boundaries, and tie together the separate buildings and spaces.
- Create an identity that embraces the Memorial, commercial, cultural and transportation functions of the site.
- Create sub-identities that are compatible with the overall framework for WTC site signage but allow leaseholders to develop a clear identity.
- Create a strong graphic identity (logo) for the WTC that can be used in a variety of media (print, signs, video, etc.)
- Equip the graphic identity system with simple and bold colors palette, 3D forms, typefaces, lighting and materials that reinforce the character of the architecture.
- Use environmental graphics to welcome visitors to the Site and allow them to experience a sense of security and confidence in their navigation of the space.

Identification signs are visual markers that indicate the name and function of a place or space. They appear at the beginning and end of routes, including entrances and exits to destinations within larger destinations and clearly mark the transition from one kind of space or function to another. The development of a distinctive design vernacular for identification signs can contribute to a cohesive identity to a place. Legibility, visibility and consistency of identification signs and their components need to be maintained throughout the system.

Identification Goals

- Design a family of wayfinding and environmental signs and directories to unify the site under one identity and style, define its boundaries, and tie together the separate buildings and spaces.
- Establish consistent locations for identification signs throughout the site and ensure that the architecture has allowances for these elements.
- Develop a comprehensive and changeable map graphic that can be easily updated.
- Create a cohesive and consistent naming system for the parts of the site: buildings, building entrances, transit facilities, retail sectors, and public areas (open spaces, Memorial), that helps unify the place and respects the needs of tenants of particular buildings.
- Select a main identification material or colors for WTC signage that provides the right balance of contrast and harmony in the architectural setting.
- Select materials and forms that reiterate the significance of the site.
- Create identity elements strong and bold enough to stand out among the crowded and fast-paced environment, yet express the respectful and solemn character of the site.
- Use standard English, and international symbols wherever possible to address the cultural diversity of WTC visitors.

Applications of identification signs are usually in the form of illuminated or non-illuminated dimensional letters, logos or sign plaques that are mounted to wall surfaces. At the WTC site, these should be located at:

- Building entrances and lobbies
- Entrances to the PATH and MTA systems
- Retail entrances
- Public facility entrances

9.2.4 Direction

Directional signs are the main thread of any wayfinding system as they provide immediate information for users to navigate public places. This type of sign routes pedestrian traffic between main entrances, key decision points, destinations and exit points by using type, symbols and arrows. Directional signs should harmonize with the architecture yet be distinguishable enough to be recognized by the user. The information should be simple and visually categorized for easy navigation throughout the facilities. Connections to the office buildings should be clearly linked and visible to visitors and tenants alike.

A comprehensive wayfinding directional system needs to be created to guide users around the WTC site and to nearby destinations. Exterior directional signs need to direct users to destinations within and adjacent to the site (i.e., WFC, Battery Park, A/C/E subway station, Wall Street, etc.). These signs could be freestanding structures, outside the PATH Terminal, located on sidewalks, plazas and parks when necessary, where they clearly direct visitors to the various destinations, but should be integrated into the architecture/building so as not to distract pedestrian pathways or views.

The use of symbols and terminology on directionals must be consistent in tone and graphic style, with simple English messages being the primary language. This will ensure a universal understanding of sign messages among the cultural and linguistic diversity of WTC visitors.

Investigations should be made into designing and integrating the wayfinding, retail, office, transportation and cultural signage into an electronic broadcast signal downloadable to pdas, phones and other electronic devices using new technologies (WiFi/R.F. and GPS).

Direction Goals

- Use clear and easy-to-remember messages, symbols and forms for directional signs.
- Use standard English, and recognizable symbols wherever possible to address the linguistic and cultural diversity of WTC visitors.
- Locate directional signs at key decision points in visible locations, minimizing the blocking of views.
- Select a typeface, colors, layouts, materials and forms that lend themselves to simple and clear signs.
- Categorize directional sign messages by function: Cultural, Memorial, Transit, Commercial Office and Retail.
- Direct visitors from the periphery of the site to adjacent Lower Manhattan destinations (Statue of Liberty, World Financial Center, Battery Park City, Financial District, South Street Seaport, etc) using the Alliance for Downtown New York (ADNY) standards.

9.2.5 Orientation

Orientation signs help situate users within their surroundings by showing an abstracted overview of their environment. Spatial orientation is typically achieved through a comprehensive site map at intensive decision-making points where overall orientation is needed and feasible. Orientation signs should be supported by the system of directional and identification signs that assists visitors in making decisions about vertical and horizontal circulation into other levels. If located in outdoor areas, orientation maps should offer an understanding of the entire site within its vicinity. If located inside, they should offer an understanding of both horizontal and vertical circulation marking important access and exit points.

Orientation signs should show the exact location of the user, "You Are Here," within his/her surroundings. Each level should display plans (axonometric or flat) of all other levels along with directory listings. These listings can be in alphabetical order or any other method of categorization that facilitates and expedites wayfinding. Due to the changing nature of this information, changeable technology and electronic maps should be considered.

Orientation signs are typically freestanding units to allow visibility to a large number of users simultaneously. If space does not allow, they can be wall-mounted. These signs need to be located in appropriate locations where they do not obstruct the circulation of the visitors, especially in areas of high pedestrian traffic or views to important destinations.

These units should be made out of strong and durable materials that can withstand the everyday use of visitors. Although natural and artificial light will be present in some parts of the below-grade concourses, interior or indirect illumination of these signs is recommended to attract visitors.

Orientation Goals

- Make the user/visitor experience clear.
- Create a comprehensive directory system with maps and keys that has both fixed and changeable elements.
- Have both indoor and outdoor versions of the directories at appropriate scales for the setting and context.
- Create an orientation map for the whole site showing all levels and access points (consider both flat graphic and axonometric views) and keys to important tenants and services.
- Display all maps in the same orientation (North-South).
- Research the best available technologies for fixed and changeable displays.
- Orient visitors from the periphery of the site to adjacent Lower Manhattan destinations (Statue of Liberty, World Financial Center, Battery Park City, Financial District, South Street Seaport, etc.) using ADNY standards.

9.2.6 Information

Information signs display constantly changing information such as time, temperature, stocks and headline news. In a transportation environment, these signs convey the most important information to the commuter: ticket fare, route maps, and schedules. Because information is never static, dynamic electronic display cases (such as LED or LCD) are often employed.

It is important to determine essential information from non-essential information within each space. A time display is important in a waiting area. Sometimes information displays can become important site-specific or civic landmarks. The clock in the center of Grand Central Station is such a civic landmark.

Adequate provisions for information intensive facilities must be in place prior to construction as the accuracy and quality of these displays will effect the use and perception of the Site as a whole. State-of-the-art technology will provide users with important to-the-second information.

The size, color and quality of the image should be clear, with sufficient resolution for the desired viewing distance. For crucial transit-related information such as emergencies, delays and changes in schedule, the unit should be able to display special message signals and provide clear instructions to the public. Given the evolution of technology, it is worth exploring interactivity between users and information displays through web applications and wireless technologies.

INFORMATION GOALS

- Identify areas where digital, electronic or mechanically animated signs are appropriate and develop a comprehensive technology signage program (transit, schedule, on-site events, local/national/ global news, other relevant data: stocks, weather, etc.).
- Do not create distracting images, such as flashing signs or moving images. Flashing words or overlapping moving photo images and text are not permitted.
- Encourage the remote interactivity between visitors and personal information technology (web, kiosks, PDA's etc...).
- Explore technologies and display systems that will enable the accessing of information in a variety of languages.
- For exterior areas, the design of any information stanchions or boards should be considered and coordinated with the information, location and sign cases designed by ADNY.
- Informational signage shall not be used for private or promotional goals.

9.2.7 Interpretation

Interpretive signs form the educational and cultural component of a sign system. They offer, among other things, relevant historical, cultural, architectural or scientific information for the viewer to gain a deeper understanding of his or her surroundings. They can also serve as inspirational objects that allow people to interact and feel part of the space.

Interpretive signs can take the form of installations (interior or exterior), public art (sculptural) or more traditional exhibit signs with text and image. Locations for interpretive signs should be identified and assessed in relationship to wayfinding components Therefore scale, location, materials and safety should be carefully considered.

There will be opportunities to place interpretive signs at different locations in the new WTC complex. At ground level, various architectural features such as Wedge of Light Plaza, Sept. 11th Place and the Memorial itself will offer interpretive opportunities to the general public.

Interpretation Goals

- Educate the general public about the past, present and future of the WTC Site.
- Create an environment of solemnity for September 11th victims and their families.
- Ensure that the Memorial is the most prominent interpretive element on the site and that other gestures don't compete with it.
- Collaborate with artists to create interpretive public art.
- Explore media and technology for interpretive and public art pieces throughout the WTC site.

Advertising Goals

- No commercial outdoor, exterior advertising such as sign boards visible from any public street or open space is permitted.
- Special event signage/advertising can be permitted (e.g. three sheets, cultural event signage, etc.).

9.2.9 Retail

Retail space will be a significant component of the WTC Site. The new development will feature significant retail areas both at and above street level (exterior) and at below grade concourses. Both areas will require specific signage guidelines to support the intended character of the various interior and exterior spaces, and shall be compatible with the unique architectural design features of the individual buildings. The design criteria shall be subject to the approval of the office building architect and the Net Lessees.

Retail Goals

- Encourage the use of simple and clear graphic treatments for retail signage.
- Find the right balance of harmony and diversity within the various retail signage areas.
- Respect the constraints and opportunities of different kinds of environments on site in creating signage standards: interior site streets vs. exterior site streets, ground floor lobbies vs. underground concourses.
- Acknowledge the need for retailers to express their brand identities and make their identity visible from more than one point of view.
- Create detailed guidelines for location, scale, material and construction of retail signage that will fit comfortably within the architectural settings and acknowledge retail presences.

Three types of signs will be needed:

- Identification signs for individual stores.
- Interior orientation directories to describe the locations of the stores and retail areas.
- Directional signs guiding people to major areas of the retail complex.

A basic style for the overall retail complex within the WTC site will need to be created with guidelines for signage, pageantry and event information. If this retail center will be managed and named as a single retail destination, a compelling graphic identity will be required to market it as such.

Preliminary interior retail guidelines have been established in chapter seven of this report. More specific exterior retail guidelines will be found in section 9.4 of this chapter. Once the architectural design is finalized, it will be possible to develop more specific (architecturally related) retail guidelines.

9.3 Sign Types and Locations

9.3.1 Sign Type Diagram

LOCATIONS PER CATEGORY

Site	Transit	Commercial	Retail	Memorial	Cultural
Wedge of Light HUB Plaza Liberty Park Sept. 11 Place Washington Place Sidewalks Streets Parking Delivery/Service	PATH terminal MTA stations	Towers Hotel Lobbies Ob. Deck	Above-grade Street level Below-grade	Memorial Mem. Museum	Perf. Arts Center Visitor Orientation & Education Center St. Nicholas Church

SIGN TYPES PER CATEGORY

Site	Transit	Commercial	Retail	Memorial	Cultural
Exterior: Site ID's Area ID's Site Maps Site Info Interpretive Vehicular Directional Pedestrian Directional Interpretive Pageantry Site Regulatory Site Informational Parking Entrance ID's Parking Regulatory Parking Directional Public Art	Exterior: Bldg Entrance ID's Street Access ID's (PATH/MTA) Ped. Directional	Exterior: Tower ID's Hotel ID's Lobby ID"S Orientation	Exterior: Retail Area ID Store ID's Ped. Dir. Regulatory	Exterior: Memorial ID Orientation Ped. Dir. Orientation ADA	Exterior: Building ID's Entrance ID's Directionals Pedestrian Directional Regulatory
Interior: Delivery ID's Site Regulatory Parking Regulatory Parking Directional ADA Site Maps Site Info	Interior: Platform ID's Orientation Regulatory Information Advertising Concourse ID's Zone ID's Elevator ID's	Interior: Lobby ID's Elevator ID's Directories Fire Code Advertising Information Stair ID's	Interior: Store ID's Orientation Directional Regulatory		

SIGN TYPES PER FUNCTION

Placemaking Sign Types

Exterior

Site Monument

Building Monument

Transit Marker

Public Art Installation

Interior

Wayfinding/Information Marker

Public Art Installations

Directional Sign Types

Exterior

Directional

- Freestanding
- Building Mounted

Interior

Directional

- Overhead
- Freestanding
- Wall Mounted

Orientation Sign Types

Exterior/Interior

Directory

- map
- listings

Identification Sign Types

Exterior

WTC Identification

Building Identification

Building Entrance Identification

Underground Parking Identification

Service Entrance Identification

Parks and Open Space Identification

Transit Access Marker

Interior

Lobby/Commercial Tenant Identification

Elevator Bank Identification

Exit Identification

Information Sign Types

Exterior / Interior

- time
- weather
- traffic
- community events
- memorial events
- stocks
- news

Advertising Sign Types

Interior Only

Freestanding displays

Wall-mounted displays

Interpretation Sign Types

Exterior / Interior

Interpretive text/graphic panels

Installations

Murals

Public Art

Retail Sign Types

Exterior /Interior

Retail Store Identification

Area or Zone Identification

Directional

Directory

Site Signage Guidelines 9.4

Overview 9.4.1

This section will provide more specific guidelines for the following components of the signage system.

- Site Signage Guidelines
- Illumination Guidelines
- Exterior Site Signage Guidelines
- Ground Level Exterior Retail Guidelines
- Above Ground Level Exterior Retail Guidelines
- Anchor Tenants Exterior Retail Guidelines
- Commercial Signage Guidelines

Interior retail signage guidelines will be provided by the PANYNJ. Memorial and cultural signage guidelines will be established once the programs and/or design for these areas are more fixed.

9.4.2 Site Signage Guidelines

1. Comprehensive WTC signage design standards shall be developed for the site and will address directional and wayfinding signage. A strategy for consistency among signs will be developed.
2. The WTC signage design standards shall define a design vocabulary for directional, wayfinding and public open space signage identifying the primary materials, signage location zones, typefaces and standards for consistent fabrication and installation.
3. Signage materials will be compatible with the architectural palette of the building.
4. The graphic design for signage should be simple and clear. Names, and their supporting logotypes are to be the primary identifiers for stakeholders and their tenants.
5. Sign materials should be fade and vandalism resistant to ensure durability, and should be appropriate to the dignity and significance of the WTC setting.
6. All identification signs within the WTC site shall follow these design guideline standards with the following exceptions below. However, the agencies below, while exceptions to the rule, will be encouraged to follow the design standards to reinforce design vocabulary for all sign types:
   i. Transit signage will conform to the appropriate agency standards, i.e. PATH or MTA.
   ii. Memorial and cultural signs may have separate and unique identities.
   iii. Street name signs within the WTC site shall follow the ADNY standards for street name signs.
   iv. All traffic signage shall conform to DOT traffic signage standards.
7. All exterior signage shall be accessory to uses on site, however consideration should be given to certain signage for off-site destinations in Lower Manhattan including the ADNY signage standards.
8. No commercial outdoor, exterior advertising such as sign boards visible from any public street or open space is permitted. Public event/special event signage/advertising is permitted (e.g. three sheets, cultural events, etc). International and/or site specific symbols should be used wherever possible to encourage communications with international visitors.
9. Freestanding signs shall be limited to transportation, cultural (within the cultural parcels), memorial, public event, special event and wayfinding uses and be of an appropriate height to ensure visibility but yet not overwhelm the WTC setting. The placement of such signs shall not impede pedestrian flow. and should be limited to cultural and open space parcels excluding the north side of the wedge of light.

10. The number of regulatory signs should be minimized by integrating the messages into other sign type components and so as not to encourage the proliferation of signage on site.
11. Orientation (i.e. site maps and directories) and event information signs shall be placed in appropriate locations, key places on buildings and/or specially designed cases. Movable freestanding units of this sign type are prohibited.
12. There will be no signage above the highest level of publicly accessible retail.
13. Transit signage on the buildings will be located in the Architecturally Designated Sign Zone defined below.

Exterior Site Signage Illumination Guidelines 9.4.3

It is the intent of the design guidelines to develop standards for signage lighting that create a distinctive appearance across the WTC site, reinforcing the project as a whole but still allowing for creative diversity to be expressed. These guidelines cover exterior site, retail and commercial signage.

1. A sign's primary lighting shall be consistent.
2. Internal illumination of letters with translucent through returns is permitted.
3. Exposed neon is not permitted.
4. Signage with translucent, lighted faces or backgrounds visible from any WTC public open spaces are not permitted; however, translucent, lighted returns, halo lighting and indirect illumination by a remote source are permitted. Additional standards for the various uses that address lighting will be created in the future.
5. Flat screen digital or other dynamic signs are not permitted.
6. No flashing signs are permitted. No internal illuminated boxes or box letters with translucent front faces are permitted.
7. Projected images on sidewalks or other public spaces are not permitted.

9.4.4 Ground Level Exterior Retail Guidelines

These guidelines apply to ground level retail identification signs.

1. One Primary Store Identification Sign is permitted per storefront entry. This Primary Sign will be located in the Architecturally Designated Sign Zone (as defined below). In cases of more than one level above-grade occupied by a single tenant, additional primary signs shall be permitted, following the guidelines for those façade locations (see "above ground level exterior retail guidelines" below).
2. The Architecturally Designated Sign Zone shall be as defined by the office building architect and the retail developer in collaboration with the Port Authority and New York Department of City Planning to be compatible with the unique architectural design features of the individual commercial office buildings within the World Trade Center district.
3. Each store may have one Primary Sign per level, per side of the building on which it fronts but will not face the Memorial directly.
4. No sign shall be larger than 65 SF. The maximum size of a sign for a major anchor (with a program over 40,000 SF) will be subject to review by the Design Guidelines Committee.
5. Two Secondary Signs are permitted per storefront entry no larger than 4 SF each.
6. No attached canopies or awnings shall be used for signage purposes.
7. No permanent freestanding store identification signs or other freestanding sign types are permitted in front of the retail façade.
8. Paper and temporary signs may not be affixed to the storefronts.
9. Any signage, additional to the Primary and Secondary signage, installed more than 3' behind the glass shall not be counted as part of the signage allotment.
10. Retail signage should not be permitted to face the Memorial directly or into the commercial office building lobbies that are located on Greenwich Street and therefore visible from the Memorial.

Above Ground Level Exterior Retail Guidelines 9.4.5

These guidelines apply to above ground level retail identification signs.

1. One Primary Store Identification Sign is permitted per level, per exterior facing storefront. This Primary Sign will be located in the Architecturally Designated Sign Zone (as defined below).
2. No sign shall be larger than 65 SF. The maximum size of a sign for a major anchor (with a program over 40,000 SF) will be subject to review by the Design Guidelines Committee.
3. The Architecturally Designated Sign Zone shall be as defined by the office building architect and the retail developer in collaboration with the Port Authority and New York Department of City Planning to be compatible with the unique architectural design features of the individual commercial office buildings within the World Trade Center district.
4. Interior Primary Signage above ground level is defined as any signage installed inside the façade, within 3' of the glass, in the Architecturally Designated Sign Zone.
5. Secondary external signage is not permitted above grade level.
6. Paper and temporary signs may not be affixed to the storefronts.
7. Any signage, additional to the Primary and Secondary signage, installed more than 3' behind the glass shall not be counted as part of the signage allotment.

Commercial Office Signage Guidelines 9.4.6

The following guidelines give parameters for the identification of the major towers, the entry points and the key commercial tenants of the WTC complex.

1. Each of the five towers of the WTC should be identified by name and/or address with a building mounted sign. Tower lobby entrance signs should provide building major tenant ID in the Architecturally Designated Sign Zone.
2. Each office tower shall be permitted one primary sign per lobby entry.
3. Two Secondary signs per entry no larger than 4 square feet each are permitted for major office tenants occupying more than 20% of the total rentable square footage of the building and must be located in the Architecturally Designated Sign Zone.
4. Exterior entrance ID signs shall be static signs, with no dynamic digital or LED/LCD or other video components.
5. The maximum size of a sign is 100 SF.

9.5 Design Considerations

9.5.1 Overview

Designing a signage system for a mixed-use development such as the new WTC site requires an awareness and understanding of multiple and interdependent design elements, all of which play an important role in meeting the needs of the system and its users. The following section outlines these elements.

These are the primary design considerations:

Placement and Architectural Context

Visual Character

Languages

Symbols

Naming

Lighting

Existing Identities

Technology and Media

Sustainability

Placement and Architectural Context 9.5.2

A signage system that is well integrated with the architectural environment provides visitors with a seamless and effortless wayfinding experience. To achieve this, the sign system should have its own identity yet be visually integrated within the architectural environment; be simple and strong enough to complement the variety of architectural styles that will coexist at this site; be bold enough to stand out in an information intensive environment, saturated with images and media, with varying material surfaces; and have a clear and consistent relationship with the architectural forms within the space.

Each building will be designed in phases and by different architects with varying functions and components within each structure. Therefore, signage will play a key role in visually unifying the site. Though signs naturally weave their way through architectural forms, they need to hold a place for themselves and have a distinguished presence.

Public Art and Sculpture

Public art and sculpture can be important wayfinding tools and markers, helping the user to orient oneself as well as create a memorable sense of place. Important provisions and considerations should be given for the placement of and for works that can assist in the wayfinding experience.

Visual Character: Color 9.5.3

Color is a powerful tool for wayfinding and orientation graphics at transportation facilities. It has three primary functions: to create identity, to code information, and to create a sense of place.

It is necessary to select 2-3 colors of appropriate contrast and value as a basic starting palette before applying color to the different sign components. This palette should then be finalized once the designer is familiar with the exact selection of architectural materials, lighting elements and other formal components of the space. The WTC site has ample space to display signs, overhead or freestanding, with large and legible messages and bold colors. The degree to which this is implemented, depends on more in-depth color studies.

The current architectural guidelines recommend the use of metal and glass in many parts of the commercial development. The sign designer should consider fabrication materials for overheads, kiosks, display cases, etc. that complement and enhance the color scheme and structural quality of these architectural materials.

Visual Character: Color

Color for Identity

A consistent color palette creates a WTC complex identity and gives a unified character to the entire site, including its exterior paths and open areas, commercial towers, interior underground concourses, and transit areas.

Color Coding

Color coding is used to categorize information and give it a hierarchy. If used with clarity and consistency, color can be an identification tool that helps group destinations, or areas and orient users to them. At the WTC site color should be used to help distinguish the functions of the different destinations: memorial, transit, cultural, office, retail and public open space.

Color for Placemaking

Color can also be used to give a sense of place in an environment. This use of color encourages visitors to enjoy their journey from point to point, and also functions as a landmarking device. At the WTC site this use of color can happen on architectural features, public art (monuments, sculptures and installations), interpretive signage and exhibits.

Typography is a basic design tool to help define the character of a graphic system and to create a sense of place and identity for any given space. It is also a critical component in determining the legibility of an information system. A distinctive typeface shall be developed.

An appropriate typeface should be created or selected based on the following criteria:

- Legibility and clarity
- Style
- Variety of weight and styles available
- How well the typefaces complement and coexist with existing identities and environments

Type size and stroke weight play key roles in the delivery of wayfinding information. To succeed at it, the designer should first identify optimum viewing distances for each sign type. Then, by combining various type sizes and weights, the designer should establish a hierarchy of information based on the needs of the users and the space.

All signs should follow the minimum Americans with Disabilities Act (ADA) requirements for cap heights and raised lettering. For example, a 3" minimum cap-height is required on overhead signs while 5/8" minimum cap-height is required on public wall-mounted signs.

9.5.5 Visual Character: Scale

Wayfinding elements should relate to their environment, being bold or modest when appropriate, without becoming a physical obstruction or distraction. Scale controls the legibility and visibility of sign messages while also determining the impact of signs as objects.

At the new WTC site, there will be opportunities for both large and small scale signs within the system. Choosing the right scale will depend on spatial, operational and aesthetic factors. For exterior identification, freestanding signs are passible in plazas or near building entrances with actual building entrance identification signs directly on the entrance portal. In open areas , freestanding signs should be located within a clearance radius of 3' to 5' to allow for up close reading of small text. The placement of such signs shall not impede pedestrian flow

The strength and durability of signs should be evident to the users, inspiring trust in them as objects and as reliable sources of information. The materials and applications chosen should be innovative, to reflect the significance and visionary spirit of the site, but within the limitation of cost, maintenance and sustainability. Signs should be made of durable materials that are well fabricated, assembled and installed.

In addition, the selection of materials should support the design choices of the system in the following categories:

- Color palette and color stability
- Visual impact
- Character
- Visibility and clarity
- Sustainability

New signage materials and applications (such as titanium, resins, LED, LCD and fiber optics) are constantly being developed for construction. The choice of materials for signage should reflect the contemporary and progressive spirit of the WTC development.

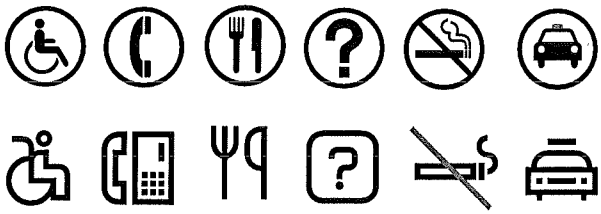
9.5.7 Languages

As the international language of business and science and the standard language used at transit facilities in New York City and around the USA, English should be the primary language used on signs at the WTC site. In terms of scale and legibility, it would be counterproductive to include multi-lingual messages on all wayfinding signage when the use of symbols can relay the information effectively. Other languages could be featured on interpretive and information signs, but should be decided on a customized basis.

Americans With Disabilities Act (ADA)

ADA requires Braille and raised lettering on wall mounted interior signs which is achieved through various fabrication technologies. In addition, other communication methods such as sound, color codes and visual displays address the special needs of visitors with different disabilities.

Symbols are the universal language that convey information quickly and efficiently. At an international destination like the WTC site, symbols can be the best method for international visual communication. A symbol family should be made to complement typographic styles, weights, colors and forms and to ensure consistency and clarity. Guidelines should be created for the application of symbols on each of the sign family's types.



9.5.9 Naming

Well considered naming can make the difference between a user-friendly and welcoming place, or a confusing maze with indistinguishable destinations. The opportunity exists to get the naming and nomenclature right, from the beginning, and for all of the pieces to fit together into the larger whole.

Naming Components

Some names have been well considered: September 11th Place, Wedge of Light Plaza, Liberty Park. Other place names designating levels, entrances, retail and commercial towers should be considered within the place as a whole and contribute to its cultural and historic significance as well as its context within the city, and may change.

These names will ultimately appear on signage and ideally should support a developed wayfinding logic of locating destinations within the site, both horizontally and vertically in space. Careful thought should be given to the naming process rather than simply adopting a working name from the design and planning documents.

Both artificial and natural light will play a powerful role in wayfinding and landmarking at the WTC site. By specifically illuminating architectural elements or consequently not illuminating them, lighting can literally tell the public where to look. In addition to giving us the ability to see, lighting can also play a theatrical role and create a mood. Although it may seem subtle, lighting is a dynamic medium for finding, understanding and creating meaningful spaces.

Lighting as Wayfinding

Lighting can become an instinctual landmarking and wayfinding tool because of the human tendency to gravitate towards light. When traveling vertically from underground, visitors can follow daylight to street level exits. Ample light can create a sense of security and therefore, pull people away from traveling through darker, non-public areas.

Consistent sign visibility is important throughout the WTC site. The amount of ambient natural or artificial light in a particular location will determine if signs need exclusive illumination. This can be achieved through internal illumination where the light source is housed within the sign, or a nearby focal light source incorporated into the architecture. Fluorescent, incandescent, fiber optic, LED, and shielded neon are all potential options for lighting signage. Their application depends on many other design and material decisions. In addition to its visual impact, maintenance, longevity, durability, cost and energy consumption must be considered when exploring various lighting options

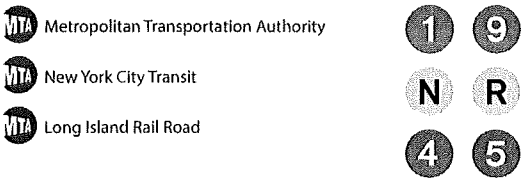
9.5.11 Existing Identities

Logos and brands are abundant in and around the WTC site. It is their primary function to identify existing services and vendors, allowing quick recognition as transportation, business, retail and cultural amenities.

The examples below illustrate and compare the wide variety of existing services and organizations and their respective logotypes at the WTC site, and around Lower Manhattan. Because they contain multiple colors and complex shapes, these logos should be used minimally on overhead directional signage where legibility is of utmost importance. They can be used on orientation directories and identification signs where appropriate. Specific logo and branding guidelines should be established with the signage design.

Port Authority

MTA



Battery Park City

New York Waterways

Other Area Logos

Signage should take advantage of the ever evolving technology and information delivery systems. Today, with new technologies, signs can be informative and constantly updated for delivering a variety of messages and information as needed by users. The particular media (or content) for these kinds of signs includes advertising, news and transit information.

Dynamic signs can be changed manually or electronically by a timed device, or a triggered reaction to an event- such as the arrival of a train. With new display technologies (such as LCD and plasma) becoming more integral to sign systems, bulky CRT tubes or projected images are no longer relied upon. Thinner, more colorful and flexible materials are being developed to change the shape and information contained in signage. It is not unusual for new technologies to have less than a 10 year life span before they become outdated or even obsolete. Therefore, constant update and exploration of new technologies is a must.

There are various standardized systems that deliver up to the minute travel, transportation and weather information from various sources.

Types of Technologies in Signage

- Wireless devices, WiFi (wireless fidelity) networks, GPS, PDA and other infrared devices
- Integrated information systems, that synchronize and share data amongst networks such as transportation, weather and travel information
- New technologies for changeable graphics, LCD, plasma displays
- New and rediscovered or repurposed materials: metals, resins, LED, fiber optics, flexible displays

9.5.13 A Sustainable Signage Program (Maintenance, Changeability, Etc.)

The sign system at the WTC site will need to be flexible for future expansion since the implementation of the sign system may happen over the course of several years. Durable materials and fabrication of the sign system will ensure easy long-term maintenance and reduce the possibility of damage and vandalism in exposed locations. When designing the sign system, the following issues should be considered:

- A modular or kit-of-parts design which is efficient in production and flexible for future expansion and updating
- Locations in places that minimize maintenance and replacement
- Vandal and tamper resistant
- Affordable materials and repairs

APPENDIX A

Acknowledgments
Contributors

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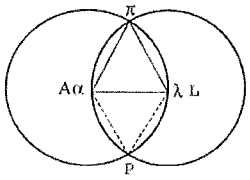
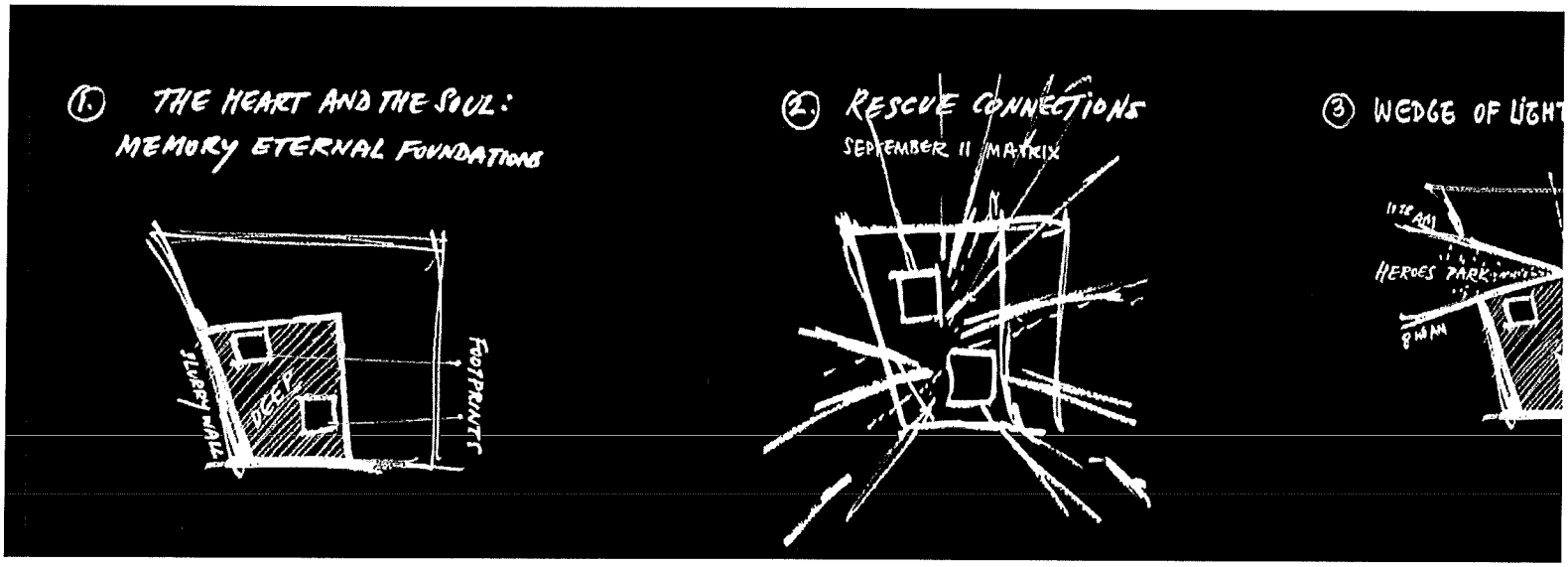
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