

Towering Ambition

The Rise of the World Trade Center: A History, With Life and Death Implications

By James Glanz and Eric Lipton



The Masters' Plan

Downtown Manhattan Reimagined by a Team of Architects Daring New York to Think Big

Peter Eisenman
Charles Gwathmey
Zaha Hadid
Steven Holl
Rem Koolhaas
Maya Lin
Richard Meier
David Rockwell
Frederic Schwartz
Rafael Viñoly
and others

Curated by **Herbert Muschamp**



Stephen Cassell and Adam Yarkinsky, founders of the Architecture Research Office, designed the U.S. Armed Forces Recruiting Station in Times Square and are working on Columbia University's War Remembrance Memorial.

Henry N. Cobb, founding partner of Pei Cobb Freed & Partners, designed the John Hancock Tower in Boston and is at work on the National Constitution Center in Philadelphia.

Peter DePasquale is a New York architect. He is working on the Asia Society Hong Kong Center.

Peter Eisenman of Eisenman Architects is best known for designing the Wiener Center for the Arts in Columbus, Ohio. He has also designed the Memorial to the Murdered Jews of Europe in Berlin. He is the Louis I. Kahn professor of architecture at Yale.

Todd Fousler, Robben Jorling and Sean Tracy of FACE Design are based in Brooklyn and specialize in small innovative projects, including residences, offices and galleries.

Alexander Gorlin has done urban planning for Battery Park City and TriBeCa and is working on affordable town houses in Brooklyn.

Charles Gwathmey and Gwathmey Siegel & Associates Architects are known for their work on educational and cultural buildings, including the additions to the original Guggenheim Museum and the Egg Museum at Harvard University.

Zaha Hadid is based in London and has designed the L'Esplanade pavilion in Weil am Rhein, Germany and a housing project for IBA-Block 2 in Berlin. Her office is working on contemporary arts centers for Cincinnati and Rome.

Steven Holl has recently designed an art museum in Helsinki and is also known for the Cranbrook Institute of Science in Bloomfield Hills, Mich. He is a professor of architecture at Columbia.

Thinking Big

A Plan for Ground Zero and Beyond

Over the last three months, a team that included some of the world's most accomplished architects began doing what architects rarely do with one another—collaborating. They had first come together to share their exasperation at how the ground-zero rebuilding process was unfolding. Then, at the urging of *The New York Times Magazine*, their gathering became more productive. The magazine invited Herbert Muschamp, the *Times* architecture critic, to curate for our pages an exhibit of their ideas. Initially, the group focused its attention on the zone formerly claimed by the protagonists of the story preceding this one. But it quickly decided not to limit its thinking to ground zero. It saw that this was a historic opportunity to construct a far-ranging scheme for all of Lower Manhattan. Painstakingly, a plan was conceived. It is displayed on the following pages (and further elaborated on our Web site).

The plan builds on some ideas that are already in circulation and is meant only as an offering to the public conversation. Much of it is based on very real ideas of what is required and how it can be financed. Some of it is daringly fanciful. Many features remain hotly contested even among members of the team. But it is there in one issue on which there is broad and passionate consensus, it is that in a city like New York, just getting back to normal is not good enough. The plan that follows is an incitement to the city to think big. It is a celebration of the power of architecture to inspire, to dazzle—and to spur furious debate.

Rem Koolhaas and his Office for Metropolitan Architecture are based in Rotterdam and New York, and their recent projects include the Guggenheim Museum in Las Vegas and the Prada Epicenter Store in New York.

Hank Koning and Julie Eisenberg of Koning Eisenberg Architecture are based in Los Angeles and have recently designed the Standard Hotel in downtown L.A. and a community center in West Hollywood.

Maya Lin designed the Vietnam Veterans Memorial Wall in Washington and recently completed the Nevada headquarters in Manhattan.

Pablo Lorenzo-Eiroa is an Argentine architect. He has designed a park in Buenos Aires.

Richard Meier has designed cultural facilities all over the world, including the Getty Center in Los Angeles and the Museum of Contemporary Art in Barcelona.

Guy Nordenson of Guy Nordenson and Associates is a structural engineer. He is a professor of architecture and engineering at Princeton.

Enrique Norton and Bernardo Gómez-Pimenta of TEN Arquitectos are based in Mexico City. Norton teaches at the University of Pennsylvania.

David Rockwell of the Rockwell Group has designed environments for restaurants, theaters and airports.

Lindy Roy is working on a hotel-ski resort in Alaska and a bar in New York City.

Frederic Schwartz of Schwartz Architects designed the new Staten Island Ferry Terminal, and his office is at work on a new train station in Florence. He was assisted by Taizo Yamamoto.

Rafael Vinoly designed the Tokyo International Forum. His office is at work on the Cleveland Museum of Art and the Leicester Performing Arts Center in England.

Don't Rebuild. Reimagine.

Now is the time for New York to express its ambition through architecture and reclaim its place as a visionary city.

By Herbert Muschamp

Legend



After the catastrophe of 9/11, who wanted to think about the aesthetics of architecture? Many people, it turned out. Buildings were the targets of the terrorist attacks. Fantasies of new buildings became a form of recovery: signs of the city's resilience in the face of unprecedented enemy assault. Proposals came from architects, artists and the public. And in July they came from the architecture firm formally chosen to supply these first-draft plans for what a rebuilt ground zero ought to look like. These official plans were universally denied.

The outpouring of images and emotions revealed a predicament gripping New York. To what extent should the city respond by getting back to normal? To what extent had the historical magnitude of 9/11 redirected the city's future away from normality? The six plans had been rejected as simply more sameness at a time when difference was called for. Had we not had our fill of "going back"?

In June, a group of New York architects met to discuss their dissatisfaction with the planning process unfolding under the auspices of the Lower Manhattan Development Corporation, the state agency created to supervise the rebuilding of ground zero and the financial district. The group included Richard Meier, Steven Holl, Peter Eisenman, Charles Gwathmey and Guy Nordenson, a structural engineer.

It had become clear to this group that the official planning process was following a pattern conventionally used by real-estate developers and that, in this instance, it had to be broken.

The pattern, a privatized version of city planning, routinely excludes architecture from the formative stages. Planners chop up the development sites into parcels, develop guidelines for each one and

Herbert Muschamp is the architecture critic of The Times.

On the Web: An interactive version, featuring audio interviews with many of the architects who worked on this plan, dozens of additional images of the architects' designs and sketches showing their evolution. Also, an online forum where readers can react to what they see on these pages. At nytimes.com/magazine.

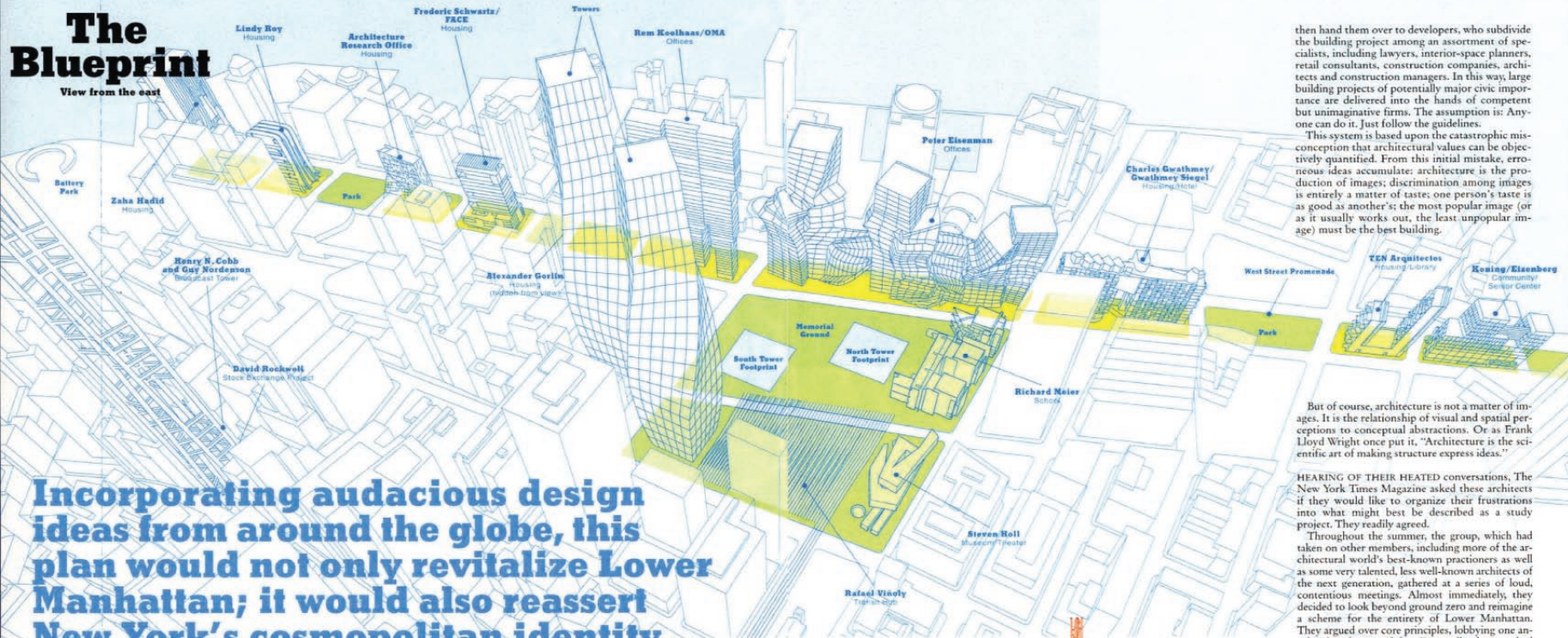
Accompanying text: Hope Reeves



Preserve ground zero as an open, hallowed place and tilt its focus from commerce to culture. Bury the West Street highway and transform the reclaimed acres into a tree-lined promenade — a necklace of innovative buildings and parks. Allow a memorial to emerge from vigorous public debate. Reconnect Manhattan's disjointed downtown. Consider making bold statements that would take New York's architecture to even greater heights.

The Blueprint

View from the east



Incorporating audacious design ideas from around the globe, this plan would not only revitalize Lower Manhattan; it would also reassert New York's cosmopolitan identity. And it would re-establish New York's skyline as the most thrilling in the world.

A New Skyline
View from the west



then hand them over to developers, who subdivide the building project among an assortment of specialists, including lawyers, interior-space planners, retail consultants, construction companies, architects and construction managers. In this way, large building projects of potentially major civic importance are delivered into the hands of competent but unimaginative firms. The assumption is: Anyone can do it. Just follow the guidelines.

This system is based upon the catastrophic misconception that architectural values can be objectively quantified. From this initial mistake, erroneous ideas accumulate; architecture is the production of images; discrimination among images is entirely a matter of taste; one person's taste is as good as another's; the most popular image (or as it usually works out, the least unpopular image) must be the best building.

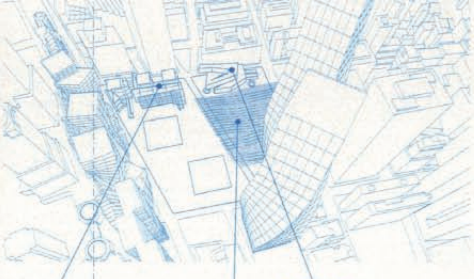
But of course, architecture is not a matter of images. It is the relationship of visual and spatial perceptions to conceptual abstractions. Or as Frank Lloyd Wright once put it, "Architecture is the scientific art of making structure express ideas."

HEARING OF THEIR HEATED conversations, The New York Times Magazine asked these architects if they would like to organize their frustrations into what might best be described as a study project. They readily agreed.

Throughout the summer, the group, which had taken on other members, including more of the architectural world's best-known practitioners as well as some very talented, less well-known architects of the next generation, gathered at a series of loud, contentious meetings. Almost immediately, they decided to look beyond ground zero and reimagine a scheme for the entirety of Lower Manhattan. They argued over core principles, lobbying one another by phone and fax. Eventually they reached something like an agreement, or at least the broad strokes of one. Then each architect was assigned a specific site and task and asked to supply a corresponding image.

Images stimulate desire; the story of this study project could not be told without them. The project itself, however, is based on the belief that images are portals into consciousness. The project conceives of the city as pedagogical center: the paramount learning device of civilization.

Lower Manhattan is *Continued on Page 53*



Richard Meier
School

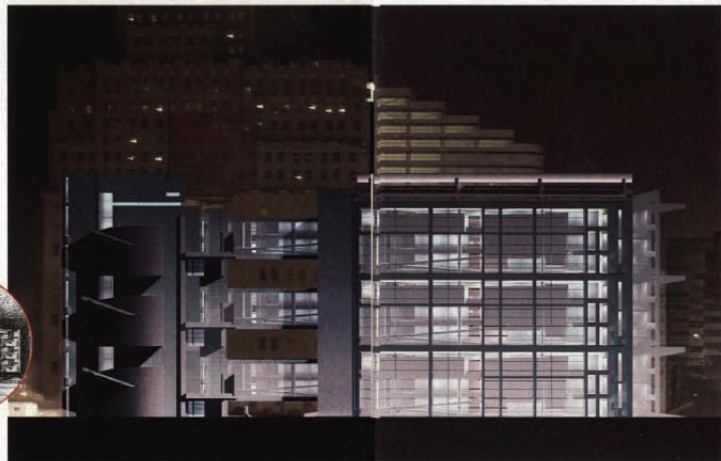
Steven Hall
Museum/Theater

Rafael Viñoly
Transit Hub

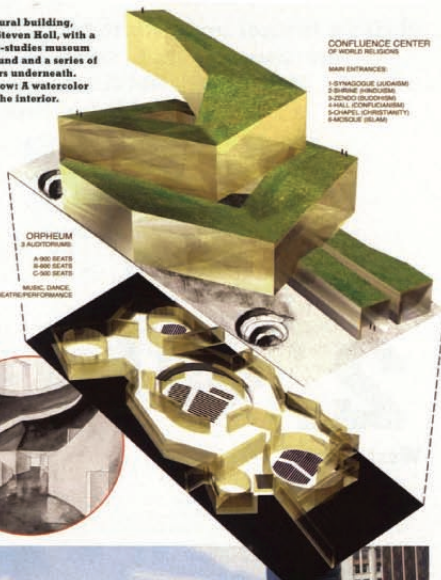


1. Ground Zero

A school, right, by Richard Meier, with a transparent facade. Inset: An early elevation sketch of the design.



A cultural building, right, by Steven Hell, with a religious-studies museum above ground and a series of theaters underneath. Inset below: A watercolor of the interior.



CONFLUENCE CENTER
OF WORLD RELIGIONS

MAIN ENTRANCES

- 1-SYNOGOGUE (JUDAISM)
- 2-SHRIVE HALL (HINDUISM)
- 3-HALL (CONFUCIUS)
- 4-SHARIF (CHRISTIANITY)
- 5-ARCULUS (ISLAM)

ORPHEUM
AUDITORIUMS

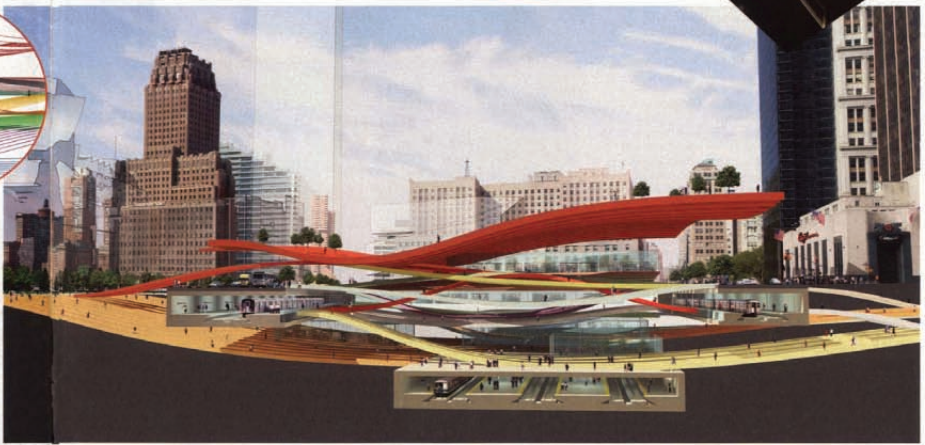
- A-800 SEATS
- B-800 SEATS
- C-500 SEATS

MUSIC, DANCE,
THEATRE PERFORMANCE



Leave the 16-acre site largely open. Delineate and preserve the footprints of the original twin towers. Add a school, a museum and performance space. Build an innovative transit hub exposing the teeming city below. Link neighborhoods by reconnecting what the World Trade Center once severed: Greenwich Street.

A transit hub, right, by Rafael Viñoly, with undulating concourses. Inset: A conceptual drawing suggesting how the various levels would intersect.



Rafael Viñoly Transit Hub Connecting subways, trains and buses to Lower Manhattan, the Mass Transit Interchange would feature curved pedestrian paths that undulate between the surface and the underground, seamlessly uniting two separate realms of the city. Wavelike ramps lined with shops and cafes would intersect at different elevations throughout the complex, moving walkways and escalators would connect pedestrians to various subway lines. The capitol terminal, which at its peak could rise 10 stories, would have a glass facade, allowing views from a neighboring plaza into New York's underworld. The basic mechanics of urban movement would become a spectacle in their own right. "The design conveys the notion that New York's underworld ought to be the same as above ground," Viñoly says.

Richard Meier School This school, the Urban Faculty, would offer a place for architects, scholars and the public to create solutions for city problems — from traffic congestion to air pollution. Adjacent to the twin-tower footprints, the center would have auditoriums, classrooms, offices and meeting spaces. A classic modernist structure sheathed in glass, the center would provide a transparent gateway to a plaza. "The openness of the building says, 'What goes on inside is also what's going on outside,'" Meier says.

Steven Hall Museum/Theater An underground cultural center would hold three auditoriums — separated by fabric partitions that could be pulled back, connecting the spaces — for music, dance and theater performances. Above the surface would be what the architect calls a Confluence Center of World Religions. Visitors could enter this museum through separate portals that incorporate the architectural motifs of major religions: Christianity, Islam, Judaism and Buddhism. The museum would be shaped like an upward spiral, offering a metaphor for the process of enlightenment; visitors would rise slowly through the museum and then arrive at a common roof garden.

Build a tunnel beneath today's West Street, funneling express traffic underground. On the surface, create two one-way streets to serve local traffic. Line the space between these two streets with showcase highrises — apartment complexes, hotels, community centers and office towers. Open the cross streets to knit together Lower Manhattan, connecting Battery Park City and the Hudson River to the rest of downtown.

2.

West Street



West Street
View from the west



Koning/Eisenberg
Community/Senior Center

TEN Arquitectos
Housing/Library

**Charles Gwathmey/
Gwathmey Siegel**
Housing/Hotel

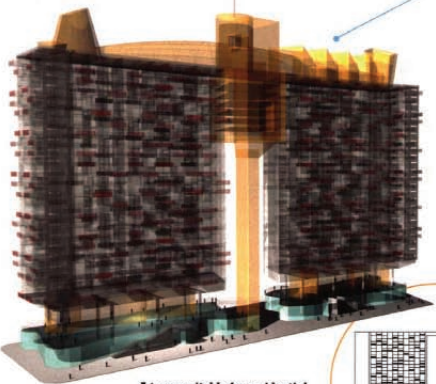
Peter Eisenman
Offices

Rem Koolhaas/OMA
Offices

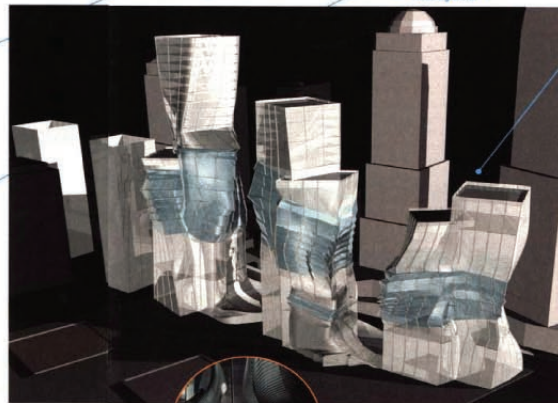
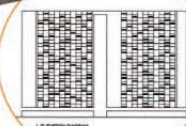
Charles Gwathmey/Gwathmey Siegel
Housing/Hotel This combination of housing and a hotel suggests a new model of urban living. The building would feature one- to three-bedroom apartments — almost all of which would be duplexes, giving residents the feeling of living in small houses. To emphasize the individuality of each living space, the exterior design immediately outside each apartment would vary to reflect its interior design. The resulting facade would be modular and, in a sense, “designed” by the residents themselves. The building would extend over a cross street, but a gateway on the ground floor would allow easy passage for pedestrian. The ground floor would also accommodate retail and restaurant space. The building’s top eight floors would serve as a luxury hotel, again consisting primarily of duplexes. A restaurant, conference rooms and an athletic club would be placed on the roof inside a series of sculptural forms that would, Gwathmey says, “create a dynamic view from across the river and give the building a long-range identity.”

Koning/Eisenberg Community/Senior Center
Located on the northern tip of the West Street strip, this proposed community center reflects opinions voiced at recent community-board meetings. A bookstore, child-care center and coffee shop would occupy the ground floor; a senior-citizen center, retirement housing and a public gym would share the upper floors.

TEN Arquitectos Housing/Library This U-shaped building, designed by Enrique Norton and Bernard Grómez-Pimentas of the firm TEN Arquitectos, would house apartments in two vertical towers and a library and retail space in the horizontal space between them. One tower would be taller than the other to create views from the uppermost floors. Staggered terraces would come in various colors.



A tower suitable for residential and hotel use, by Charles Gwathmey/Gwathmey Siegel. Inset: An early elevation diagram.



Office towers, by Peter Eisenman/Eisenman Architects. Inset: A restaurant on the ground floor designed by Hernán Díaz Alonso.

Peter Eisenman Offices The crumpled profiles of these three office towers suggest partly collapsed structures. In so doing, the buildings would echo the deconstruction wrought on 9/11 and offer a striking memorial to the fallen towers, at the same time, they would provide three million square feet of new office space. “This memorial,” Eisenman says, “could be appreciated from anywhere in the city.” Although the buildings’ rippled facades would flow into the concrete as if they were melting, the interiors would resemble those of any normal office building.

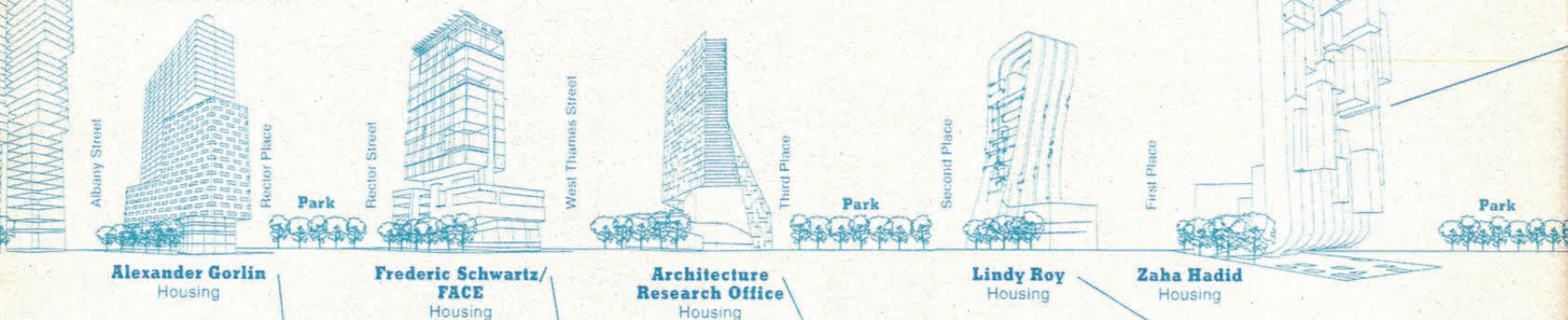
Rem Koolhaas/OMA Offices The 60-story office tower designed by Rem Koolhaas, Dan Wood and Joshua Ramus of OMA would offer an inversion of the typical skyscraper form: the building would grow wider at the top, giving extra space to the more desirable and expensive upper floors. Struts between each “leg” of the building and its neighbors would serve the dual purpose of connecting them and supporting the lower, thinner and less sturdy floors. Designed for 24-hour use, the building would also contain housing, apartments, hotel rooms and retail and cultural space; the roof would be a green area. “The skyscraper as a typology can continue to be reinvented,” Wood says. “The destruction of Sept. 11 doesn’t mean we have to be less grand and more timid.”



Office towers, by Rem Koolhaas/OMA. Inset: An early, fanciful scheme by Koolhaas that combined elements of all the team’s buildings into one structure.

Many buildings along West Street's new tree-lined promenade would have multiple uses, combining offices, apartments, lofts and hotel rooms. High-priced luxury apartments (with spectacular harbor views) would subsidize more affordable housing and a community center.

West Street (Continued)
View From the west



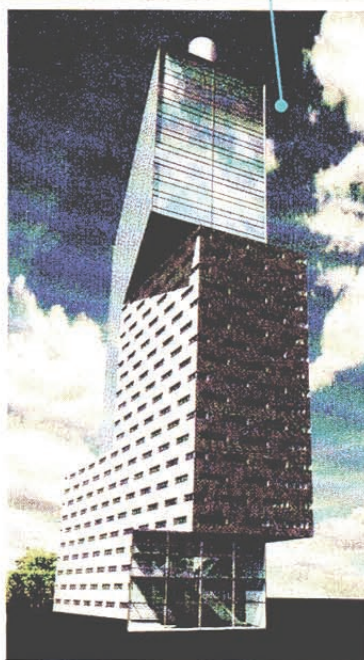
Alexander Gorlin
Housing

**Frederic Schwartz/
FACE**
Housing

**Architecture
Research Office**
Housing

Lindy Roy
Housing

Zaha Hadid
Housing

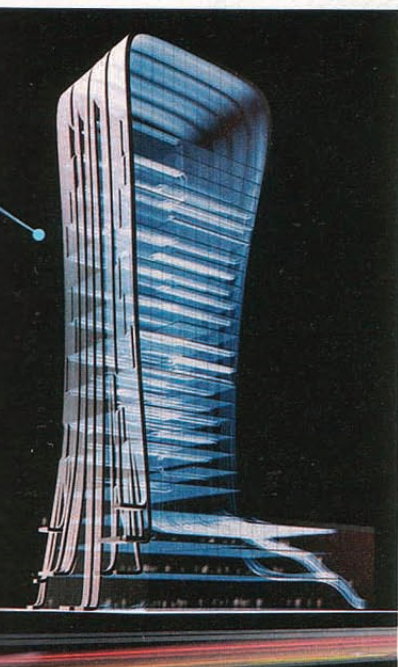
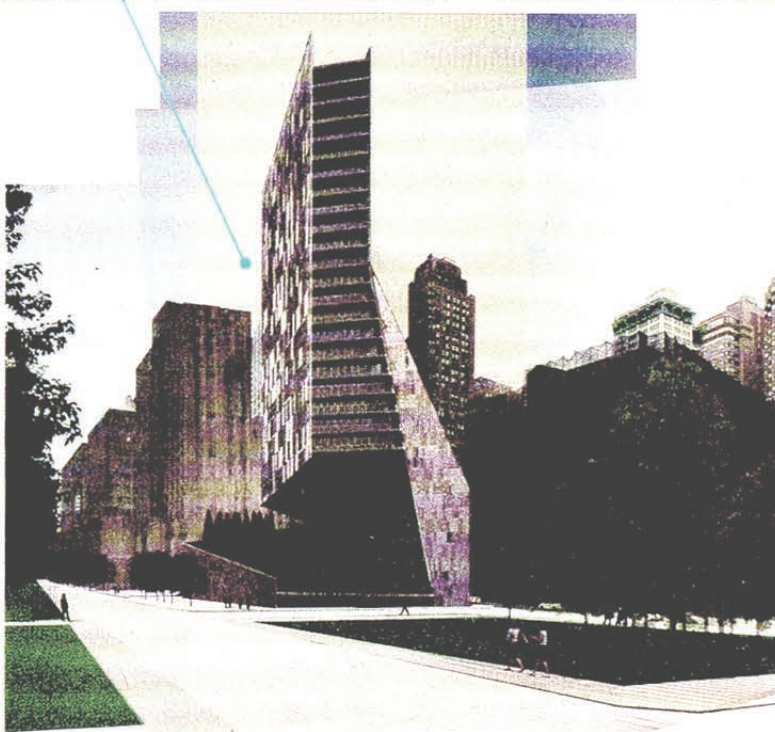


Alexander Gorlin Architects Housing The addition of large swaths of glass would turn this structure into a bold reinterpretation of a classic New York design: the postwar white-brick apartment building. Although the roof would be a recreation area and retail space would occupy the ground floor, the building would primarily house loft apartments. "They would come with suggested floor plans, but they would really allow the person who lives there plenty of flexibility," Gorlin says.

Frederic Schwartz Architects/FACE Design Housing The glass-and-concrete bottom of this 28-story building would contain retail shops, artist lofts and performance and exhibit spaces. The floors above would be prefabricated duplexes plugged into a steel framework. While all the apartments would be made of the same materials, half would be set aside for affordable housing. These apartments would be placed side by side with more expensive units. The building would feature several open-air communal decks with gardens. A trellis of photovoltaic solar cells atop the roof would help provide energy for the building.

Architecture Research Office Housing Starting from a wide base, this building would taper as it rises to its 30-floor height. Retail shops on the first few floors would be topped by a sloping park. The lower floors would be designed as live-work loft spaces; apartments on upper floors would assume a more traditional design and layout. The building's skin — layers of laser-cut stainless steel that is thick at the bottom and thin at the top — would unify the structure. "This is how you reintroduce housing in New York: make it look like some of the better parts of Manhattan with their incredible mix of commercial and residential," says Stephen Cassell, a founding member of ARO.

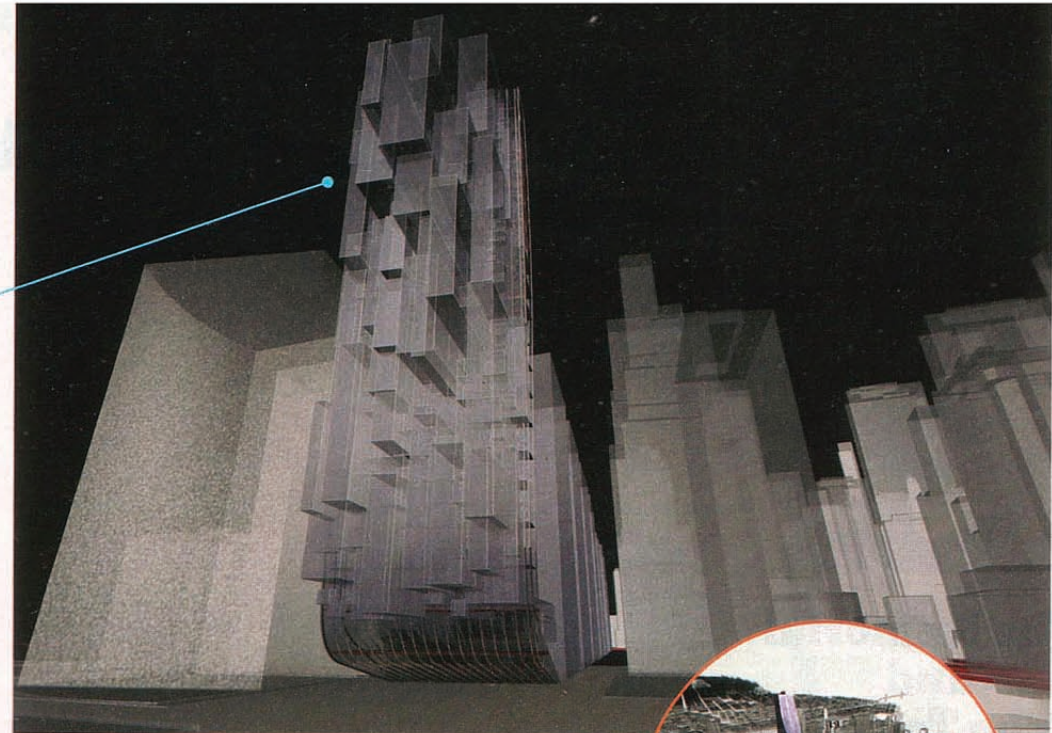
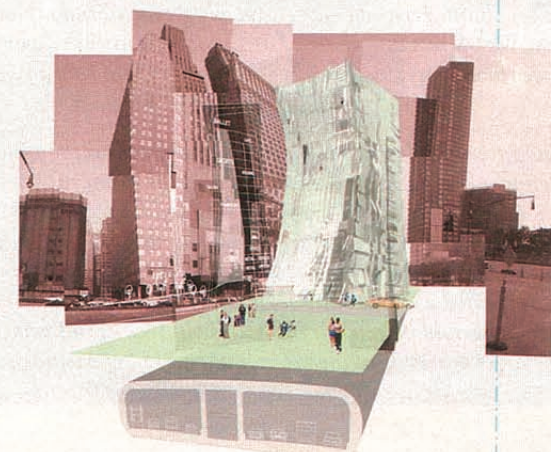
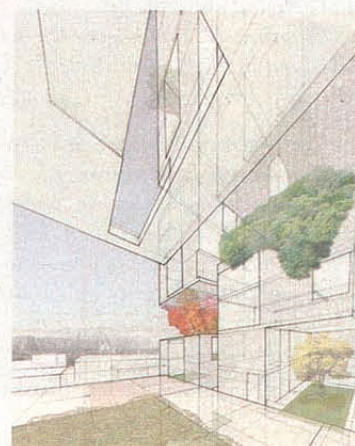
Lindy Roy Housing The design for this 28-story structure is inspired by the road sunk beneath it. The building's form suggests a multilane highway that wraps itself around a very steep mountain; it is almost as if a car could drive up and over it. The lower portion would serve as commercial and retail space; the upper floors would have a gallery of differently sized and priced apartments. A health club, swimming pool and green recreation space would occupy the top floors and roof. "I was really intrigued by the idea of actually building on a former highway — one that's such an integral part of the city," Roy says.



**Skyscraper,
by Zaha Hadid.**
Inset right:
The building
as viewed from
the harbor.

Zaha Hadid Housing This towering skyscraper, which when viewed from the side resembles an enormous J, would be located at the southernmost end of the West Street strip. This singular vantage point would afford spectacular views of New York Harbor and the Statue of Liberty. The building would feature some of the most expensive apartments in the city; the profits generated could help subsidize other housing along West Street. Throughout the building, living space would coexist with prestige office space, often on the same floor and in varying sizes. The mix-and-match result, Hadid says, would "reflect the cultural diversity of New York."

Downtown is not the only part of the city requiring boldness. Peter DePasquale and Pablo Lorenzo-Eiroa designed prototypes for residential buildings that could be placed anywhere in the city. DePasquale's design, left, emphasizes communal gardens; Lorenzo-Eiroa proposes a twisting structure, right, that would allow residents to park cars outside their apartments.



Continued from Page 49 a site of convergence for two sets of urban infrastructures: the transportation systems (including streets) that provide access to the financial center and the communications systems that connect distant cities into an evolving global economic framework. The study project proposes to link these two systems with a third: a cultural infrastructure designed to reinforce connections between cities around the globe.

The project does not set forth a comprehensive plan. Rather, it presents an integrated set of options for the future of New York, a widening of possibilities beyond the shopworn, consumerist notions of "cultural programming" that have been proposed for ground zero: an opera house, for example, or the downtown branch of an uptown art museum. The product envisioned by the study is a recast cultural identity for 21st century New York: a revised mythology of our place in the era of globalization. The entire framework is presented as a living memorial to those who died in last year's attack.

THE TEAM BEGAN by adopting a strategy developed by Frederic Schwartz, architect of the Staten Island Ferry Terminal at the southern tip of Manhattan. Schwartz, who worked on the Westway highway project in the 1970's and 80's, had long recommended burying a segment of West Street, a six-lane state highway that divides Battery Park City from the rest of Lower Manhattan.

After 9/11, Schwartz calculated that the land created by burying this segment could easily yield 16 acres of developable land, enough to match the size of the World Trade Center site. He then figured out how the trade center's commercial bulk could be distributed over a new West Street development corridor.

In one stroke, this strategy accomplished two goals. It temporarily eliminated commercial pressures from the highly contested ground-zero site. And it healed a gash in the cityscape that had long obstructed the integration of Battery Park City with the financial district. The plan did not prohibit building on ground zero. It simply created a space for planners to devote more time and thought to conceptualizing how best to utilize the site.

The design team adopted the same commercial program used by the Lower Manhattan Development Corporation's planners: 11 million square feet of office space, 600,000 square feet of retail space and a 600,000-square-foot hotel. Buildings along the new West Street corridor could equal or surpass this bulk, with the advantage that they could be built incrementally, as demand for office space increased. Most of the office space would be in a mix of high-rise and supertall buildings on and adjacent to ground zero, closer to transportation. Most of West Street, then, could be dedicated to housing.

The team also took into serious consideration how the plan would be financed. A new West Street corridor, augmented by so-called connector buildings south of the World Trade Center site, would add new land worth at least \$2 billion. (That figure was provided by a developer who cooperated with

the project; other experts speculate that the figure could be much higher.) This land could then be sold to developers, raising enough to cover the estimated \$2 billion cost of building a platform over West Street. Or, if the platform were financed with state and federal dollars, the tax revenues could support a city-administered program for subsidizing developers who choose to invest in architecture rather than dull simulations of it.

South of the World Trade Center site, city planners envision the development of a robust residential community that might be known as South Greenwich. The study project builds on this idea by designating sites for residential buildings that would link this new neighborhood to West Street, Battery Park City and the river.

Some of the West Street projects will appear bizarre or perhaps self-indulgent to those unfamiliar with contemporary architecture. But this is not a lineup of architectural beauty contestants. All are conceptually rooted, in step with the level of architectural ambition in Vienna, Tokyo, Rotterdam and many other cities overseas. You have to look beneath the skin, for example, to appreciate the extraordinary elegance with which Charles Gwathmey has manipulated a single duplex unit into a variety of apartment layouts, which then generate the modeled facades.

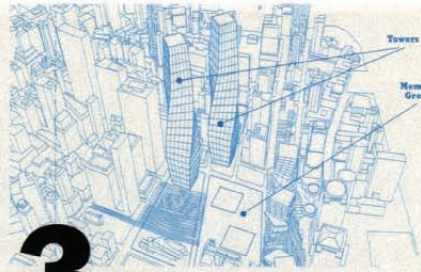
Rem Koolhaas's project satirizes New York's nostalgic obsession with the Art Deco skyscraper by turning three of them on their heads. Peter Eisenman's three office towers can be viewed as a formalist exercise, for example, but they are also a critique of the Cartesian grid. The history of ideas is the context for architecture today.

Information is the second nature of the cosmopolitan age. Like grain, it requires cultivation. That process includes studying the why of things, the relationship between causes and effects. For the team, the violence of last year exposed the need for new instruments of cultivation, tools for interpreting raw data on world events. This is why this project devotes key space at ground zero to cultural institutes of learning, buildings designed by Richard Meier and Steven Holl.

The group also decided that the ground-zero site should specifically address the teeming infrastructure that lies below the city's surface. Rejecting the classical Grand Central Terminal notion of a "big room," Rafael Viñoly designed a transportation hub that distributes the circulation space in a series of switchbacks and visually celebrates the industrial grandeur of converging rail systems.

The study does not address the design of a permanent memorial, apart from recommending alternative sites. Since there are no physical footprints remaining of the World Trade Center, we have proposed articulating them in a reconstructed landscape. Though the team agreed that ideas for a memorial must come from a public process, Maya Lin was asked for her thoughts on what might be done.

About the rebuilding of the towers themselves, the group was especially divided. In the end, it was decided that one proposal would be published —



3. The Memorial and The Towers

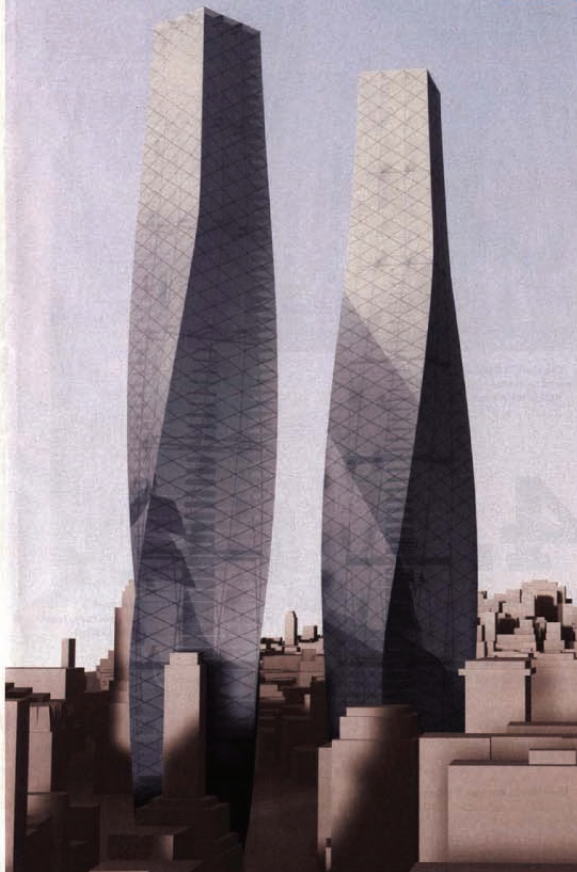


Maya Lin Memorial Following the idea that a memorial should rise out of extended public debate, the team of architects that reimagined Lower Manhattan did not offer a formal proposal for a monument to Sept. 11. The magazine, however, asked for a sketchbook of thoughts from Maya Lin, the designer of the Vietnam Veterans Memorial Wall in Washington. Lin suggests three possible sites for a memorial; in her view, the chosen location will help define what kind of memorial should be built. First, she suggests placing a memorial not at ground zero but amid the new, vibrant West Street promenade (a). Another possibility would be a demarcated path between the twin-tower footprints (b). Finally, she imagines building an artificial island in the Hudson River (c), one that would be connected to Manhattan with a tree-lined promenade.

In addition, Lin's sketchbook contains three ideas for projects devoted to remembrance. The Sacred Garden would transform the footprints of the former trade center into reflecting pools surrounded by a park. Every Sept. 11, the towers of light would reappear, projecting from the pools. Another concept, the Light Towers, would require coordination with the adjacent structures so that they could be built to create a frame around the disaster site. The buildings would be luminous — glassy and airy — so that they formed a "candelabra" encircling the site. On the evening of each Sept. 11, the other buildings' lights would be extinguished, allowing the beams projecting from the footprints to shine into the night sky. A third idea is to build a Hall of Memories, located within the restored plaza, that might contain artifacts from the disaster's rubble.

Should there be towers? Imagine a pair of skyscrapers every bit as ambitious as the original structures — only more sculptural in form. Consider building memorials of light, water or rubble.

Towers The architects who came together to reimagine Lower Manhattan reached a consensus on many aspects of this plan. The question of replacing the twin towers, however, was more difficult. Some recoiled at the idea; others were enchanted by the prospect of crowning Manhattan's skyline with bold new skyscrapers. What is presented here is one idea that emerged for new towers. Resembling candlesticks, the buildings would be located at the intersection of Liberty Street and Church Street, straddling the southeast corner of ground zero. One tower would be located inside the site, while the other would sit just outside it. Such a placement would not only allow the twin-tower footprints to remain; it would also let ground zero become more than a memorial site. These towers would be roughly the height of their predecessors, though thinner and torqued to suggest resilience — as if they were made of a material that, if bumped, would simply absorb the shock. Would these towers be a new World Trade Center? Not necessarily. In addition to office space, they could house a mixture of cultural, retail and housing units. Another conception would accommodate today's heightened safety concerns: the towers could stand simply as monuments, empty but for a museum on the ground floor.



Another notion for a tower comes from Guy Nordenson, a structural engineer. His is not a formal design but an idea for how a skyscraper could be torqued to make it structurally sound, even at very great heights. An exterior structure of steel and an interior structure of concrete work together to resist both wind and gravity; the twisting of the entire form reduces the dynamic effects of the wind.

for two towers, identical in size to the original ones, with one foot in ground zero and one foot outside it. Two shapes — place holders for buildings that might occupy these sites — were inspired by a variety of sources, including a sculpture by Isamu Noguchi, two airport control towers by Bartholomew Voorsanger, an office building by Frank Gehry, a conceptual design for ground zero by Richard Dattner and a pair of candlesticks of unidentified authorship. The idea was to present an “unauthored” symbol, an image of collective imagination. The symbolism is mutable: people can project a variety of meanings on these shapes, and they are all equally valid. For me, they signify resilience and the civilizing conversion of aggression into desire.

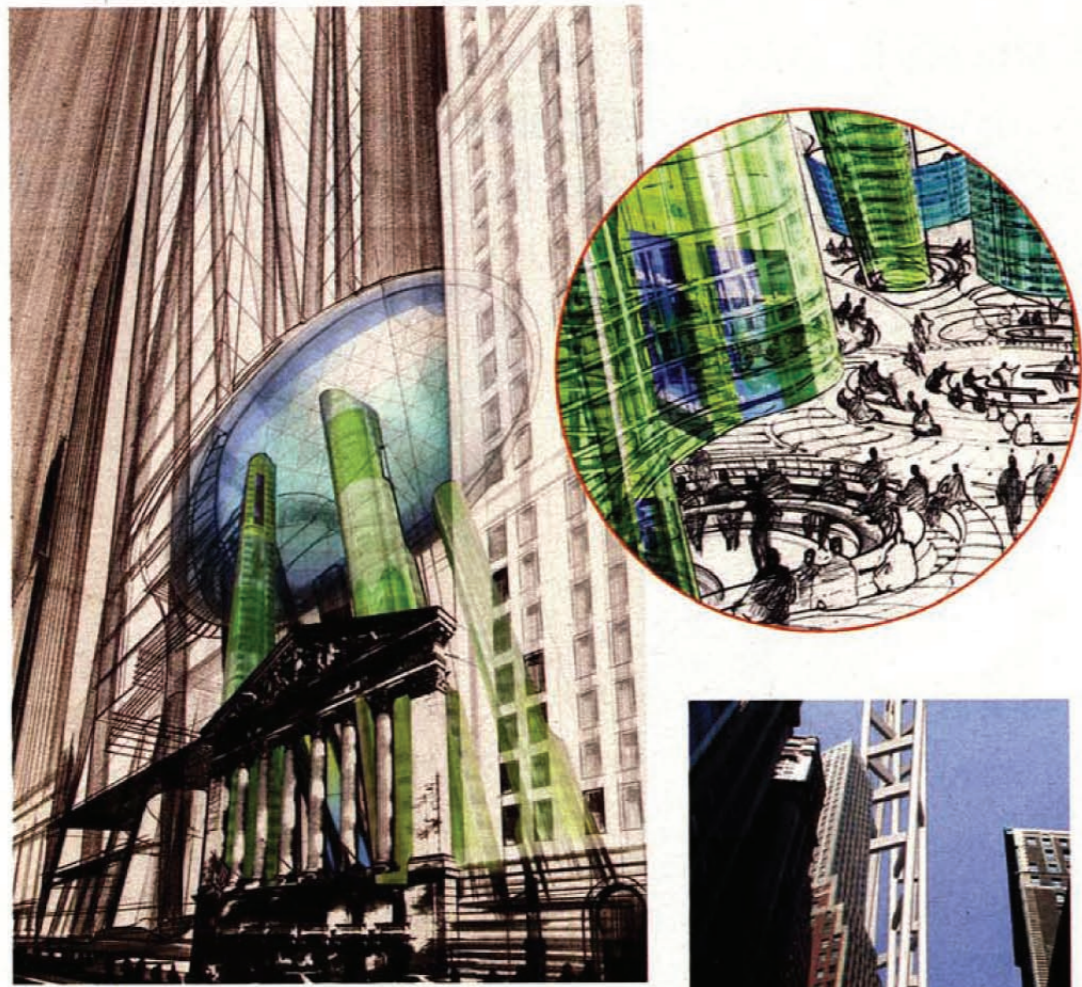
Finally, though the team did not fully endorse this idea, we present David Rockwell’s rendering of a giant cybertheater over the New York Stock Exchange, which he calls the Hall of Risk. It is designed to educate the public about the social trade-offs caused by modernization. Adjacent to it, Guy Nordenson and Henry Cobb have designed an elegant broadcast tower that they fancifully imagine as the tallest structure in the world. Rather than shying away from ambition, this project embraces it with all its might.

HOSPITALITY TOWARD STRANGERS . . . insistence on excellence. The urban historian Bonnie Menes Kahn has identified these two qualities as the indispensable cornerstones of cosmopolitan life. Judged by this standard, New York may be the most cosmopolitan city ever built. The diversity of our population and the relative sophistication of our cultural appetites still generate a magnetic energy unsurpassed by other great cities. We are one great polyglot aspirational surge.

Our architecture, however, no longer reflects this cosmopolitan spirit. In fact, our buildings have turned it upside down — into a rage for dreariness and provinciality, an intolerance for the progressive ideas that have regenerated many cityscapes overseas. It is fair to say that in appearance and intention, New York’s architecture has adhered to a viciously anticosmopolitan program. The architectural study presented here is meant to turn back these forces.

If you don’t like the images, check out the concepts. You might dislike them too. But at least you’ll gain a sense of architecture as an art of connecting dots. In this study, meaning is derived less from individual projects than from the relationships between them.

This is a work in progress. The publication deadline did not allow the team adequate time to focus on a number of critical issues, including sustainable design, transit links to regional airports, the elaborated design of an underground retail complex and the specific design of parks and a memorial promenade along West Street. Modernity, the philosopher Jürgen Habermas once wrote, is an incomplete project. So is New York. ■



The Hall of Risk, a conceptual space devoted to debate. Inset: The interior of the hall, divided into discussion areas.



4. The Stock Exchange



A broadcast tower that would be the world’s tallest structure. Inset: How it would affect the skyline.

David Rockwell Stock Exchange Project *The concept for the Hall of Risk was developed by Paul Ryan, a video artist and teacher, and Jean Gardner, a professor at the Parsons School of Design, and the physical design was conceived by the architect David Rockwell. It is intended partly as a theater and partly as a public forum at which global situations involving risk could be discussed and solutions developed. Located on what is now the New York Stock Exchange trading floor, the interior would be divided into a series of sunken discussion areas, and information relating to relevant topics would be streamed across the walls like a stock ticker. Giant pillars, cantilevered ever so slightly to suggest precariousness, would support a giant stadium overhead.*

Guy Nordenson and Henry N. Cobb Broadcast Tower *Seven Stems, a telecommunications and broadcast tower, would rise just south of the New York Stock Exchange Building and act as a replacement home for the antennas that used to sit atop the north tower of the World Trade Center. Seven cylindrical steel columns, each 14 feet in diameter and set at different angles, would converge as they rose to 2,100 feet, becoming the tallest man-made structure in the world. Visitors could take steps to observation decks of varying height.*

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Lombardi had terrifying dreams, including one in which a terrorist fired a shoulder-mounted missile at the towers.

SEVEN

Some days the Lower Manhattan skyline appeared with such perfect clarity, the contours of the buildings so stark, that the view from the Hudson suggested abstract sculpture carved from the blues of the water and the sky rather than from a pounding, shouting, honking metropolis. Almost as if looking at one of Yamasaki's models, the eye rose from the Battery at the southern tip of the island, passed through the stone canyons of Wall Street, stepped up to Rockefeller's slablike steel-and-glass Chase Manhattan Bank building, swung around the white terra-cotta parapets of the Woolworth Building and skipped across the droll skullcaps of the World Financial Center, before settling at the obvious trail head in the sky: the twin towers.

On this morning of soft breezes and flawless skies in New York, David Rockefeller was in his 56th-floor office at Rockefeller Center. Les Robertson was having dinner with colleagues in a Hong Kong restaurant. Yamasaki's project manager, Henry Guthard, was on his way to his architect's office in the Detroit suburbs. (Yamasaki died in 1986.) Guy Tozzoli was zigzagging his black Mercedes through Jersey City along his Holland Tunnel shortcut. Frank Lombardi was in his office on the 72nd floor of the north tower, getting ready for a 9 o'clock meeting.

And traveling at nearly 500 miles an hour down the Hudson River Valley, a hijacked plane with 92 people on board was heading toward the cultural, financial

and symbolic focal point these men had created.

Tozzoli and the Port Authority had conceived an immensity based on the program, producing the biggest and most visible object in Manhattan. Yamasaki, after his walk around the Empire State Building, decided to create something completely different, a soaring sculpture set apart on a huge plaza. Austin Tobin and David Rockefeller in the end succeeded beyond their dreams in producing a cathedral of commerce and capitalism, a symbol that now attracted both grudging respect and deep envy around the world. They had molded a place of work, entertainment and shopping—a "city within a city" that even at this early hour had drawn some 60,000 people into its borders. Tragically, these accomplishments were exactly what enticed the terrorists and made the buildings both easier and more attractive targets.

At a quarter to 9, American Airlines Flight 11 passed over Upper Manhattan and headed southward. The plane banked and flashed in the sun, and in the instant before it rammed the upper reaches of the north tower, it bore an eerie, horrifyingly precise resemblance to the image in Lawrence Wien's newspaper ad, down to the direction the plane flew and the location of the impact. But the reality was far more terrifying than Wien ever imagined. Jet worse: a second hijacked jet was soaring across New Jersey, about 20 miles to the northwest.

The second jet, United Airlines Flight 175, was flying south with 65 people on board. It made an enormous U-turn over New Jersey and accelerated northward in the direction of Manhattan. As the plane shot past the Statue of Liberty and the Battery and Wall Street, traveling at close to 600 miles an hour, it appeared at first that it might fly right past the southeast corner of the

south tower. But at the last instant its eastward wingtip banked up, and the plane struck the south face of the 31st floor, 70 feet from the southeast corner, the plane's 156-foot wingspan raking all the way from the 78th to the 84th floors.

That pattern was like the cut of a knife in a most literal sense. Robertson had made the steel in the perimeter columns extraordinarily thin in the upper reaches of the towers, where they had less load to carry. As thick as four inches near the bottom of buildings, the exterior steel tapered to only a quarter-inch in the upper stories. So, in an effect that stunned other structural engineers when they later analyzed what happened, the light aluminum of the plane's fuselage and wings simply entered the building, along with heavier parts like engines, slicing as many as 32 of the 59 columns on the south face like a machete hacking palm fronds. The soft exoskeleton and the vast interior volume of the tower allowed it effectively to ingest the Boeing jet whole, as if an elephant had disappeared through a wall. Because the resistance was so slight, the plane did not even explode when it passed through the facade. Instead, traveling on an angling path toward the northeast corner of the building, large pieces of the plane probably soared freely across the open, column-free floors; others probably ripped through some of the lightweight trusses holding the floors up. In a kind of snowplow effect, the plane scooped up computers, carpeting, furniture and other combustible office contents and shoveled it all toward the northeast corner. Hundreds of people were killed within seconds. Parts of the plane, including an engine, pieces of landing gear and a hunk of the fuselage, blew straight through the build-

ing and out the other side, raining down and landing as far as six blocks north.

At some point, perhaps when the plane collided with the dense rectangular core filled with the building's interior structural columns, elevators and escape stairwells, perhaps a third of the plane's 10,000 gallons of jet fuel ignited, creating fireballs that blew out of the north, south and east faces of the tower. The rest of the fuel splashed across multiple floors, setting uncontrollable fires, spewed down elevator shafts and dribbled across the facades. The impact of the plane almost certainly knocked loose acres of the flimsy spray-on fireproofing, which meant that the fires were licking naked steel.

To preserve the wide-open, uninterrupted floors integral to the Program, the stairwells had been clustered together in the core, and thus could be knocked out almost entirely with a single blow. In the north tower, all three stairwells were instantly severed or made completely impassable. Some 800 people were trapped above or just below the impact zone.

In the south tower, two stairwells were wiped out. The third survived, but its lightweight gypsum walls were breached and shattered. An estimated 300 people at or above the impact zone survived the crash, but only 18 of them were able to find the open stairway, make their way past the gypsum debris and escape.

The concrete-and-masonry-encased stairwells used in traditional skyscrapers might well have fended off those impacts, particularly the ricocheting lightweight aluminum parts, allowing people to descend through floors that were engulfed in fire. But the trade-center stairwells were protected by the more delicate gypsum. Running within the same stairwells were pipes carrying water for

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sprinklers and firefighters' hoses. Those pipes were cut. The tops of the towers went dry.

The initial impacts, which each applied roughly 25 million pounds of force, might have toppled different buildings. As in the experiments at the phony optometrist's office in Eugene, Ore., the towers wobbled back and forth after the impacts like boats in a tempest. But just as Robertson's calculations reassured him years earlier, the towers were built to withstand much greater lateral forces from wind than the planes could ever deliver. The towers rocked back and forth half a dozen times, perhaps a few feet each way at the top. And then Robertson's strange little shock absorbers, 11,000 in each tower, helped them come to a stop, intact and still standing.

Thousands of people in the towers and surrounding buildings lived because Robertson's structures did not topple. But even those few swaying trips back and forth damaged the unusually flexible buildings, jamming doors to elevators and escape stairways and conference rooms, and probably further ripping up the gypsum around the stairwells, helping to trap hundreds of people in and even below the impact zones.

Above each of the holes punched by the planes, Robertson's network of intersecting spandrel plates and columns acted like arches, spreading the loads to intact columns all through the buildings and preventing an immediate catastrophic collapse. Almost as if the towers were living beings trying to survive, they shifted loads from severed and damaged columns to intact ones. The process was so efficient, a federal study later showed, that columns only 20 feet from each gash were still carrying less than half the critical weight that would have ordinarily caused them to buckle. The towers stood long enough that thousands of office workers were able to escape.

In his 72nd-floor office in the north tower, Lombardi felt the room jerk to and fro. At first he thought there had been a big earthquake; then he saw the bottom edge of a fireball out of his window. He heard people screaming in an elevator, and the terror he felt in 1993 came back to him.

With the nozzle from a fire hose and a staple gun, Lombardi worked to pry open the elevator doors. Then he hustled down a stairway himself. And as he did, the fires began to spread. In the north tower, Lombardi's effort to thicken the spray-on fireproofing, begun in the mid-1990's, had been carried out on all the floors struck by the jetliner; by contrast, in the south tower, all but one of the impact floors had not been upgraded. Most of the fireproofing was probably knocked off by the impacts, according to Port Authority officials, but other experts say that the additional fireproofing in the north tower may have been able to at least retard the fire there: the conflagration in the south tower was, it appeared, the more furious of the two.

Air temperatures rose to 2,000 degrees in the hottest parts of the fires. Each tower's fire was producing heat equivalent to the power output of

a nuclear plant. Jack Daly, the construction manager who heard the helicopter pilot ditch the lightweight floor truss when it was caught in the wind that day in 1970, started to worry that part of the south tower might collapse. Daly says he thought to himself, God, they're going to lose the top. But, he says, "I never in my world, never, thought the whole thing was going to go down."

The floor trusses, made of some of the thinnest steel in the World Trade Center, almost certainly began deforming before anything else of consequence. At first, the trusses probably expanded, bowing the exterior columns — themselves thin and weakening in the heat — outward in places and causing dangerous stresses. All along the eastern face of the south tower around the 80th floor, tremendous fires raged. Eventually the thin steel of the trusses became so hot in that area that they began to soften and sag, hanging like clotheslines between the exterior and core of the building. The sagging trusses tugged inward on their bolted and welded connections to the exterior columns, and those connections began to snap. Video records of the disaster show a line of dust beginning to blow out of the east face around the 80th floor as floors began to slip away from their moorings and fall one upon the other.

Once Robertson's trusses tore away, the softening exterior columns no longer had anything to keep them from buckling. It was as if two gymnasts standing toe to toe, leaning backward and clasping hands, had suddenly let go. A single column on the east face of the south tower, about 30 feet north of the southeast corner, seems to have been the first to go, according to the videos. As other columns snapped, one by one, the entire top of the building tipped in that direction and, like a tree leaning toward the notch sawed by a lumberjack, began to fall. The force of the upper stories coming down then crushed the entire tower, ripping it apart as it fell. When debris from the top hit the ground, it was moving at an estimated 120 miles an hour. The north tower followed soon after. The death toll would soar to 2,800 people — "many of them," a devastated Robertson would write, "snuffed out by the collapse of structures designed by me."

Before Sept. 11, Robertson always had an answer for every problem he faced. In conversations after the disaster, he often stammered into silence when trying to explain his feelings about the collapses. Later, he struggled to express himself. "The responsibility for the design ultimately rested with me," Robertson said. "And I have to ask myself, Should I have made the project more stalwart? And in retrospect, the only answer you can come up with is, Yes, you should have."

But in other conversations, he became resolute, even defensive. If not for the faraway look in his eyes and the bags underneath them, he could have been the young engineering gunslinger he once was. "I don't feel blame for not having made it more stalwart than it was," he said. "I don't want to sound egotistical, but maybe it was as good as anyone would have made it, or maybe better than others would have made it. And a lot of that was associated with energy and

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youth and all that kind of thing. Had it not been me, I think it would have been an older, slower, more accepting kind of person than I was.

"But even so," Robertson said, the doubts beginning again, "had it been more stalwart, surely 1, 2, 50, 100, 1,000 people might have gotten out. It's a big burden. I feel terrible remorse for those who died."

As the structures weakened and collapsed that morning, David Rockefeller stood at the window of his office in Rockefeller Center, looking south at the smoke billowing over the business district he had done so much to create. He could see the Empire State Building, the old rival to the towers, in the foreground, a little to the east. When Rockefeller was a child, his family lived just a few streets north of where his office is now, and his mother commissioned a painting of the view from his bedroom window. The painting, which still hangs a few feet from where Rockefeller watched as the weakened steel lost its grip, depicts the 1930's New York skyline to the south, a jumble of lower buildings dominated by the Empire State Building to the east. On the west side of the city, there is only a great swath of sky running the length of the island.

"There was so much smoke that we didn't really, fully understand — the buildings literally collapsed," Rockefeller says. "You could see something drastic was happening, but it was so horrible in a way that it was almost like a dream, a bad dream." When the smoke thinned, he saw again the swath of empty sky in the west, much as it once appeared from his bedroom window. But now even the sky had been invested with a horrible meaning. History had been undone. ■

ANSWERS TO PUZZLES

OF SEPTEMBER 1, 2002

SMYRNA ENHANCE SHAMU
HOOVES LAOCOON ALANIS
ONUSES ARMLoad SIMILE
VIM DONTCOUNTONIT MOD
ESAU ONE WAS PART
STYRENE WHEAT GERALDO
RARA HARDY EEL
PRECISE ISAAC SICEM
RELIC SIGNSPONTTOYES
IDYL MSS TET BOYO SCI
OHIO BYES AWES OAF
RON ARNE BAG RDS BURT
ITISDECIDEDLYSO FORTE
TEMPE RADIO NUANCED
PAL UNITY NINE
ACRONYM GONZO IONESCO
PLOY TILK SLIP YSER
HAT ASKAGAINLATER AMA
TRISTIN PARBOIL NOTYET
DENIRO PRIMATE EYONNE
STIRS ABASHES DEPOTS

ARMADA SAMBAS
LIEOVER ALIENEE
INQUEST VINEGAR
STUNS TINALLS ALLA
BRIT USI E ALLAS
OER ADIRE AMINE
LITFLTING EDUCED
OUTSHINES
SLAVEY INSPECTS
TILES ALEUT ORE
ABAS SUEDE BIER
TEM BASSI SINAI
IRONOUT BRIGADE
CADENCE LITMOGES
LEADEN EDITED