

Towards the Skyscraper of the Future

by

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Abstract

The skyscraper has become a staple of development in the modern day cityscape by which to address the concerns of our growing population and density. The urban landscape of cities has thus been radically transformed, enabling staggering density within small land ratios. Although the repetition of generic floors can maximize a site's profitability and density, there is a condition of repetitiveness which emerges, promoting banality, lacking connectivity, and ultimately resulting in a fragmentation of the urban realm. This proposal for a skyscraper in New York City addresses these concerns, offering a new genre of skyscraper in which connectivity and social identity is of utmost importance. In blending the line between public versus private space with the strategic and deliberate superimposition of mixed program, Battery Park Tower can lay the ground work for a future of high-density living which successfully brings with it a sense of neighborhood, connectivity and vitality.

Acknowledgements

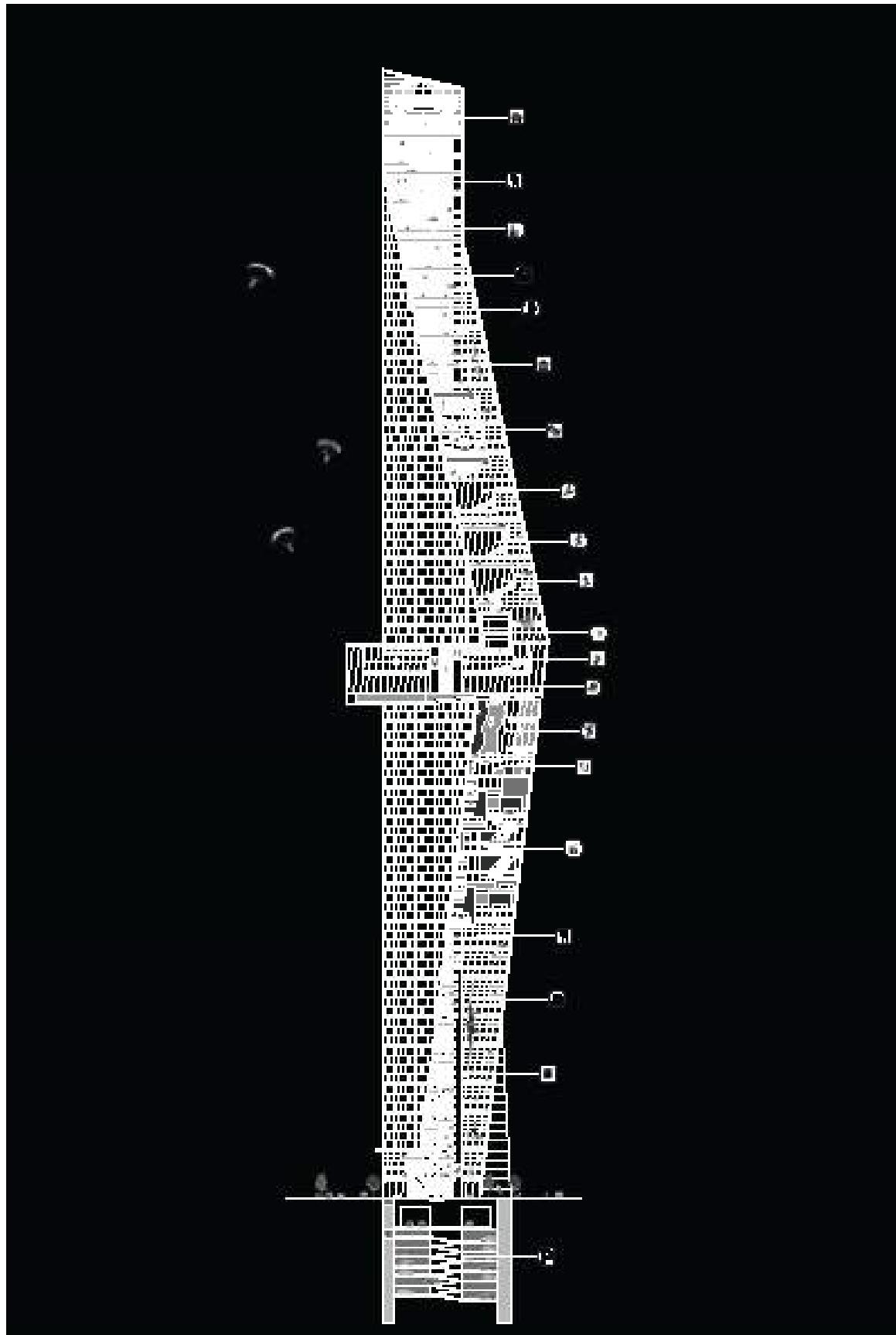
Thank you to my professor, mentor, and friend Greg Andonian, who supported me throughout my undergraduate and graduate studies. Your wisdom and insight was invaluable in my education, and in the development of this thesis.

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Preface

The initial inspiration for this thesis stems from a previous directed studies abroad program (D.S.A.) which took place in the winter term of 2014 in Helsinki, Finland. As part of our final studio project we were required to communicate a project as a single poster, derived from 2 particularly chosen writing excerpts given individually to each student. My task was to create a metropolitan high-rise that would include everything for the contemporary individual, whilst incorporating an element of faith into urbanity.

My assigned readings included:

“Downtown [Athletic/Bible/Night/Science/Food/Family] Club” -- Rem Koolhaas’ “Delirious New York” (re:Downtown Athletic Club”) and
“Metropolis of Tomorrow” -- Hugh Ferriss (re: Churches Aloft.)

As homage to these two seminal New York City projects, the Battery Park Tower section presents the result of a tower where public connection is carried throughout the entirety of the building. Divided into two portions, the tower is split vertically between public and private functions. The 117-story building contains a full height atrium, which connects and crosses a wide range of recreational and entertainment programs, including cinemas, sports facilities, restaurants, shopping, a church and even a climbing wall. In splitting the building program vertically, each program can overlap and mingle with the other, ideally creating a vertical city.



(1a) Downtown Athletic Club, 1930, Starrett & Van Vleck, Delirious New York
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(2) Churches Aloft, 1929 Hugh Ferriss, Metropolis of Tomorrow

Part 1:
The Nature of the
Skyscraper

Introduction

The skyscraper has radically changed the landscape of our large cities, however this takeover has not in all cases been a positive one. The introduction of a high-rise building to a location has with it the potential to powerfully transform the life of its surroundings, both with positive and negative ramifications. Subject to a myriad of factors all working synonymously together, the location, scale, context, and function of a high-rise can determine its positive or detrimental induction.

In many dense city districts these relationships have become fractured. Streets have become isolated and cold places, where the monotony of towers and blocks has adversely segregated the life of the city. Whilst not the sole bearer of blame, the skyscraper has played a vital role in this disintegration. The standard skyscraper by today's measure is one which lacks in diversity of form and program.

Usually given over to a singular function of residential or office use, repetitive floor plates and monotonous uninteresting facades make these towers insignificant in their urban application both inside and out. This disruptiveness can be dissected into two distinct categories of which this thesis will focus on, the nature of the skyscraper itself and the skyscraper as it relates to its urban context. Divided into two portions, the first half of this writing looks at the nature of the skyscraper as a disconnected entity in of itself. Birthed from the ability to repeat floor plates upon themselves to an unforeseen height, the very nature of a skyscraper from birth is one of vertical detachment. The latter looks at the skyscraper and its relationship to the urban realm. Whereas traditional city planning principles have allocated skyscrapers to confined zones with singular functionalities, over the course of the last half century urban planners have realized the imperativeness of diversity and density, shifting the paradigm towards the public realm and its ability to bring vitality and richness to each facet of city life. In breaking down these

two variables, the ensuing proposal for Battery Park Tower will aim to provide a feasible solution to bring a sense of community and connectedness back into our city cores and back into skyscrapers themselves by means of the connected skyscraper.

Defined

Loosely defined over the years, the term skyscraper has continually shifted in definition and meaning. What was once a tall building may by today's standards be minuscule, and today's tall buildings may someday be deemed small in comparison to future tall buildings. In an attempt to form some type of classification system the CTBUH, Council on Tall Buildings and Urban Habitat has listed 3 categories in which to define a "tall building." These factors are a building's height relative to its context, proportion, and tall building technologies. The context of a building can alter the perception in which a building is perceived in being tall. A 10-story building may be deemed tall in a low density city, whereas the same building placed within a dense city district like New York may appear undersized. In the same way a building which is proportionally large in width contrasted to its height may alter one's view of whether that building is tall. The final element which constitutes a building as tall is its inclusion of tall building technologies. These include vertical transport technologies and structural elements as a requirement of wind bracing. Whereas these 3 elements can still leave the definition of tall building somewhat vague, a general threshold in which a building can be classed as tall according to the CTBUH is 14+ stories, or 50+ meters (165 feet) in height. In recent years due to technological advancements which have radically pushed the preconceived limits of height, the classification of tall buildings has been expanded to include "supertall"; a building over 300 meters (984 feet) in height, and "megatall"; a building over 600 meters (1,968 feet) in height. As of June 2015 there were 91 supertall and 2 megatall buildings fully completed and occupied globally. Many of these buildings are part of a long history in the global race for the tallest building in the world. While today's standards now require an elaborate classification system for World's Tallest status, just over a

century ago the ability of a building to reach fractions of these heights was barely fathomable. In tracing back the history of the skyscraper to its birth we end up in late 19th century Chicago.

Birth of the Skyscraper

In the midst of a booming industrial economy Chicago would be nearly wiped out in the 1871 Great Chicago Fire. The subsequent period of reconstruction saw a birth in a new phase of modernism construction, with engineers and architects looking to alternative construction solutions. The first skyscraper was birthed in this moment from the architecture studio of William Le Baron Jenney. Although only reaching ten stories tall, the Home Insurance Company Building built in 1884 represented the first implementation of a steel frame construction in a tall building. In the current period tall building's relied on thick outer masonry walls to support the loads of the upper floors and roof. A taller building would require larger masonry walls at the base, limiting and deterring developers from building tall. Architects would look to the use of cast-iron and wrought-iron frameworks to support their buildings, and eventually the use of steel would take over as precedent. Steel, a material much lighter and stronger than iron was first introduced by Henry Bessemer, an English inventor who patented a method of mass-producing steel inexpensively, a procedure nicknamed the Bessemer process. By replacing masonry and iron framework construction with steel, the upper floors would then be supported, allowing more floor space on the lower levels. Coupled with the use of a curtain wall, a self supporting external cladding, steel frame construction would offer the abilities of greater heights, and thus a greater repetition of floor plates. With this technological advancement a new dilemma would arise, that of quickly and safely transporting passengers up to these floors by means of the elevator. While elevators were a technology already in use for the hoisting of goods since 1844 in England, the first "safe" passenger elevator was introduced by inventor Elisha Otis in the 1852 World's Fair held in Manhattan. His invention, a fail-safe means of preventing an elevator from falling should the rope break was presented as a theatrical spectacle.



(3) Elisha Otis presenting his “safe elevator” invention, 1852

“An assistant presents Otis with a dagger on a velvet cushion. The inventor takes the knife, seemingly to attack the crucial element of his own invention: the cable that has hoisted the platform upward and that now prevents its fall. Otis cuts the cable; it snaps. Nothing happens, to platform or inventor. Invisible safety catches—the essence of Otis’ brilliance—prevents the platform from rejoining the surface of the earth.” (Koolhaas, Rem. Delirious New York, A Retroactive Manifesto for Manhattan. The Monacelli Press, 1994. Pdf. 35)

The introduction of a safe elevator would radically change not only the capabilities of architectural design in regards to height, but also at the same time completely reverse the existing economies of real estate. Whereas in the previous era the most prime real estate was located on the lowest floors where patrons would not need to climb sets of stairs, the new opportunity to effortlessly ascend would flip the script. Higher would mean greater views, access to daylight, less noise, more fresh air, and in turn greater rents. Where a building’s height was previously determined by the length of stairs it would require to reach the top floor with ease, the elevator would make all future floors to an unknown number easily accessible. Together the limitlessness of an “ascending room” along with the ability to reach higher and higher with lighter steel frame constructions a new realm of development would ensue, the vertical.

A Vertical Realm

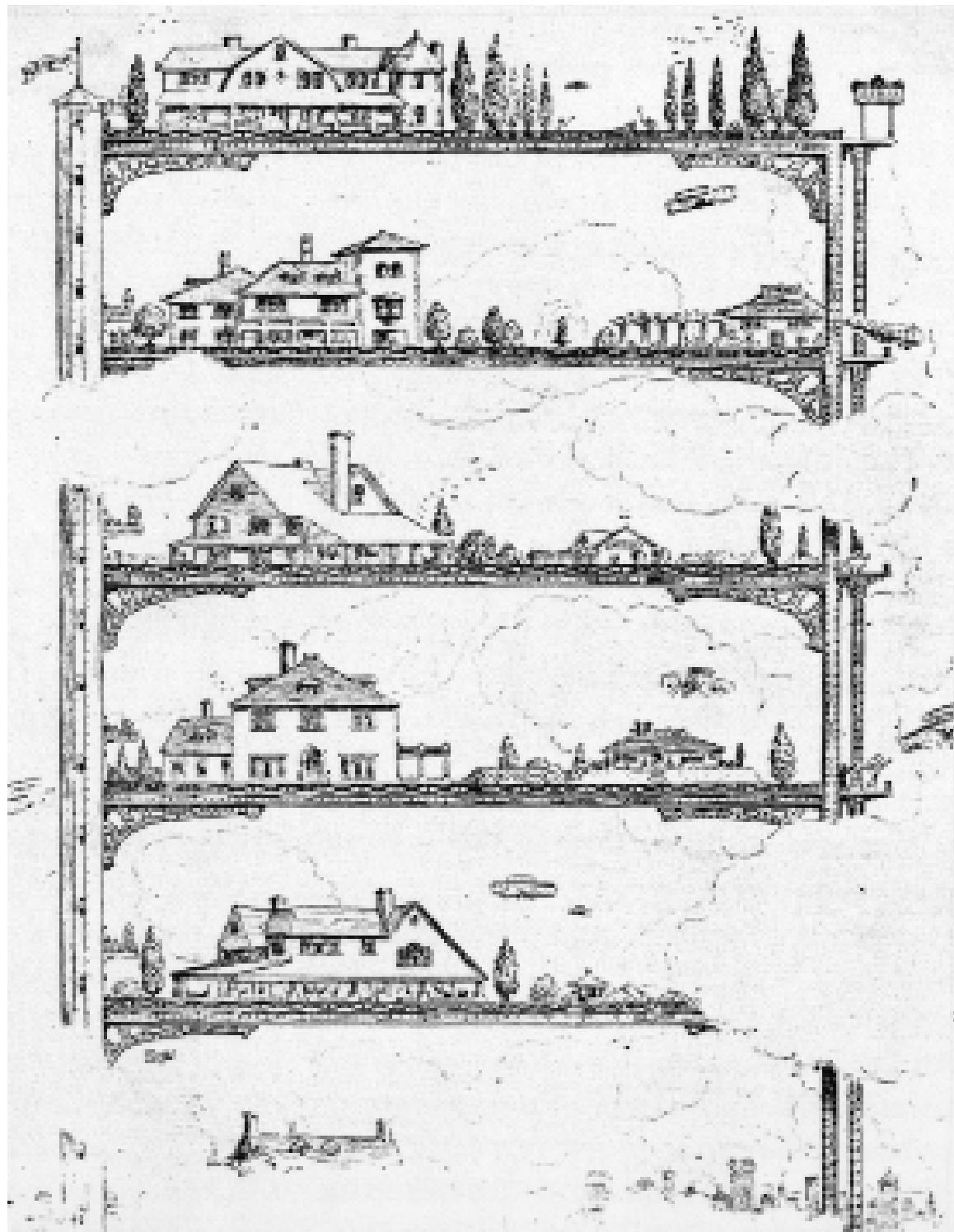
A 1909 March issue of Life magazine featuring a full page cartoon would set a powerful narrative of the future “high-rise” into motion. Drawn by A.B. Walker, the cartoon depicted a massive steel framed structure reaching into the clouds. On each level, a home was situated, portraying a picture of a single country house complete with yard, perimeter fence, stables, guest houses, and gardens on each level. The caption below read,

“Buy a cozy cottage in our steel constructed choice lots, less than a mile above Broadway. Only ten minutes by elevator. All the comforts of the country with none of its disadvantages.’ – Celestial Real Estate Company” (Koolhaas.128)

The implications of this portrayal were heavily postulated in Rem Koolhaas’ 1978 book *Delirious New York*, where he gave meaning to the cartoon as a theorem of the ideal performance of the skyscraper. With a private realm at each elevator stop completely disjointed and separate from its predecessor below and whatever floors came above, each floor would represent a fractured life of the structure as a whole, an interesting irony in which together each of these separated realities would add up to a single entity.

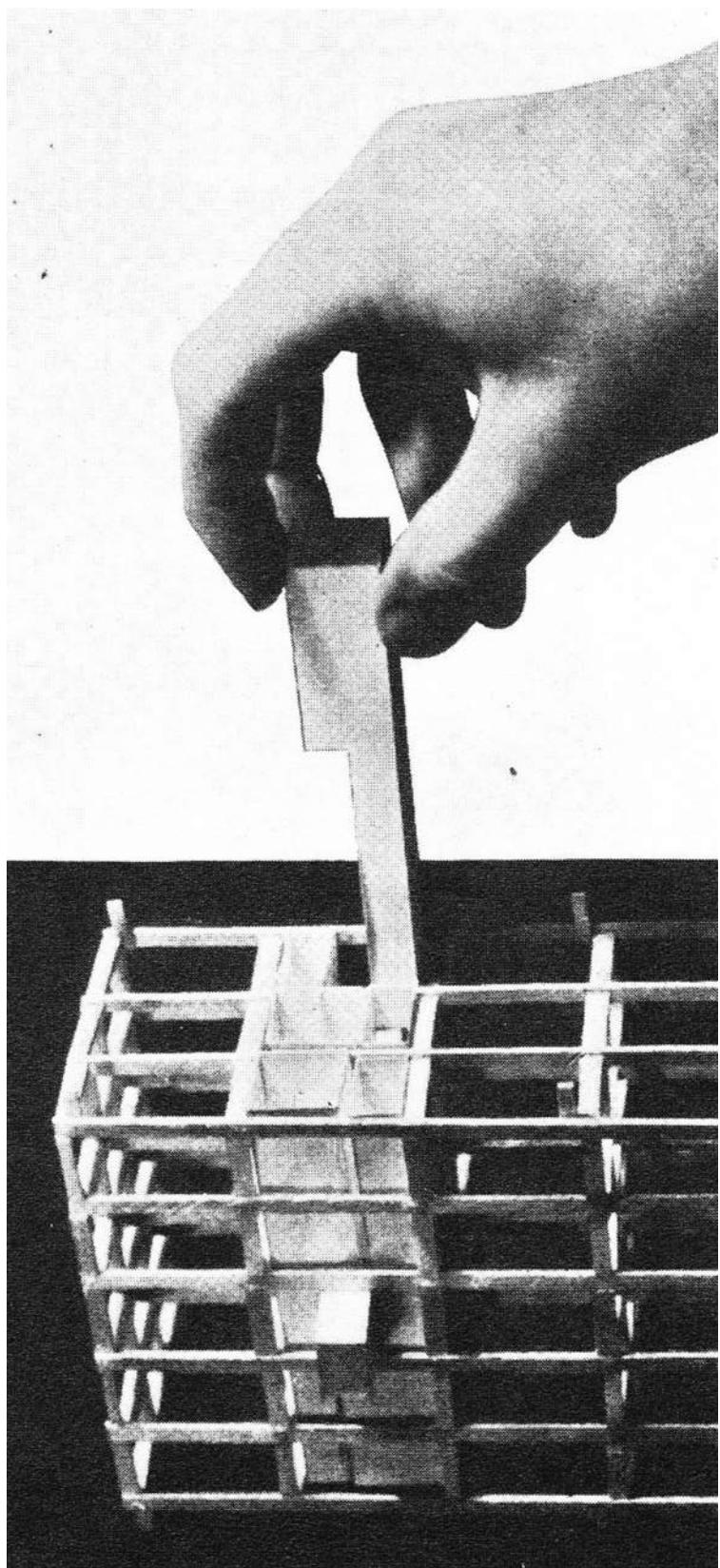
“The building becomes a stack of individual privacies, with the affirmation that the activities within may be replaced and change whilst the framework will remain the same.” (Koolhaas.124)

From this perspective from now on a particular site could have any number of purposes, all simultaneously situated within each other yet able to remain separate. With the core necessity of the skyscraper needing only to be a framework from which to infill, the nature of the skyscraper would be as a form of “unknowable urbanism.” (Koolhaas.129)



(4) 1909 Theroem represents the original intentions of the skyscraper. Individual privacies stacked on one another, only connected through the elevator 19

This depiction of the skyscraper as merely a steel frame “rack” was picked up by many theorists and architects over the years, most notably of which being Le Corbusier. In his ideas for Unite’ d’Habitation, Le Corbusier similarly depicted this notion with sketches portraying his building as a type of drawer or wine rack. Each prefabricated residential unit would be inserted within the rack, able to be withdrawn and replaced as needed.



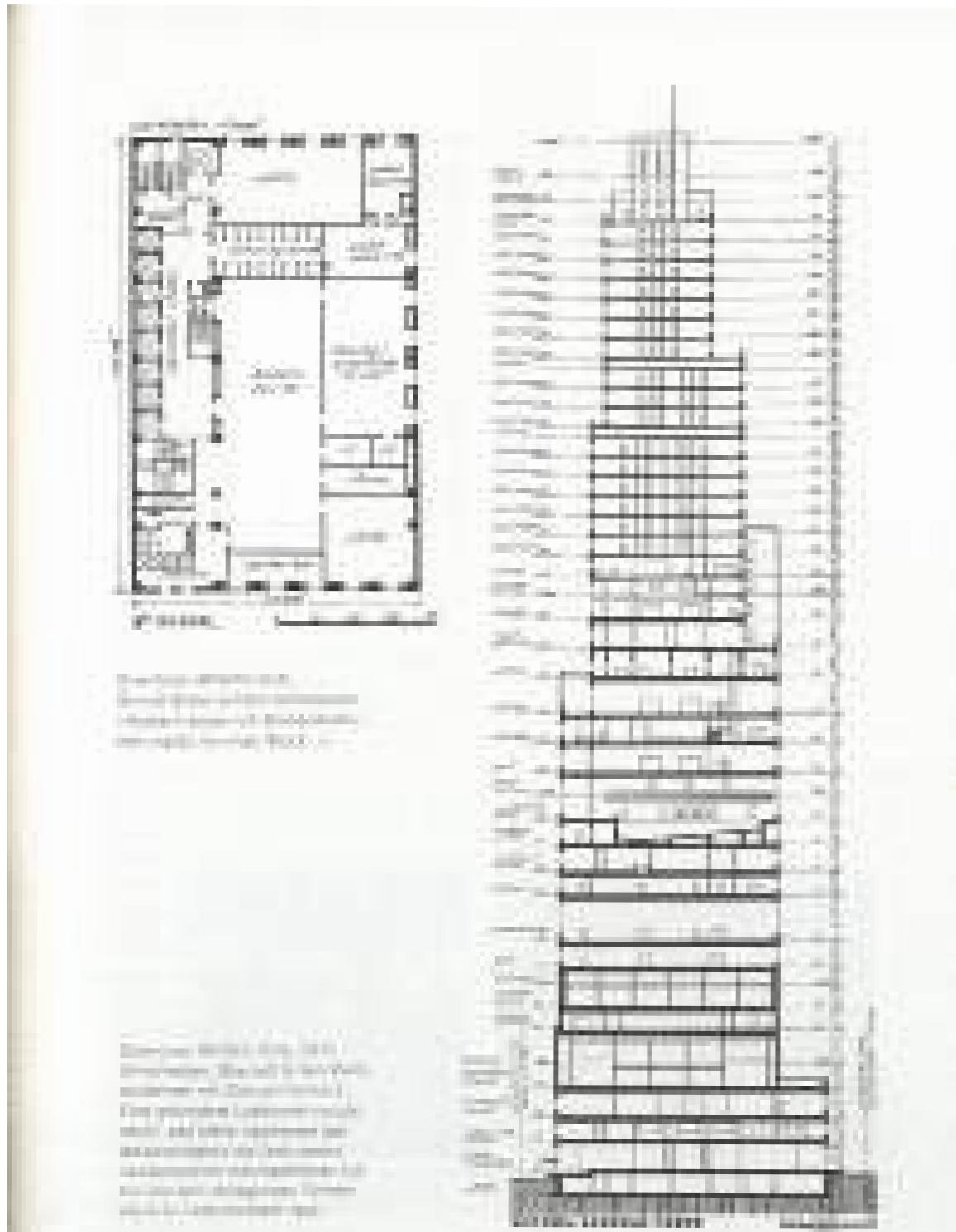
(5) Le Corbusier, Unite d'Habitation, Prefabricated Cell, 1947

The 1909 Life drawing would carry on a life of its own, influencing a number of architectural streams of thought relevant even today. A prime example of this concept being brought to reality was in New York's Downtown Athletic Club. The Club was built in 1931 on the bank of the Hudson River near Battery Park, the southern tip of Manhattan. Due to a relatively small site and the high cost of land the different functions and facilities of the club, including swimming pool, gymnasium, miniature golf course, squash, and tennis courts, dining rooms and living quarters all needed to be accommodated on separate floors. The final design reached a height of 38 stories (534 feet), with 13 elevators forming the north wall of the building. The Downtown Athletic Club represented the reality of the 1909 Life advertisement drawn 22 years earlier.

"The club represented the complete conquest—floor by floor—of the Skyscraper by social activity... in the fantastic juxtaposition of its activities, each of the Club's floors is a separate installment of an infinitely unpredictable intrigue that extols the complete surrender to the definitive instability of life in the Metropolis." (Koolhaas. 250)



(1a*)Downtown Athletic Club, 1930, Starrett & Van Vleck, Delirious New York
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(1b) DAC Section, 1930, Starrett & Van Vleck, Delirious New York

New York as Precedent

New York and more precisely Manhattan stands as one of the most prominent examples from which to study the skyscraper and its rise in popularity. Prohibited from lateral expansion from its very inception by rivers on either side, Manhattan has had no choice for providing the density of which it is now known for without building skyward. With the implementation of the grid by way of the Commissioner's Proposal of 1811, all future development would be locked to the confines of the streets and surrounding water. The Commissioner's Plan divided Manhattan into 12 north-south running avenues and 155 streets running east-west, thus creating a total of (13x156) 2,028 blocks. In a poetic duality this confinement to the grid would predict all future activity and development in the lateral plane, but with no exception or thought to what the vertical realm may develop to. This phenomenon is what Rem Koolhaas would call "the immunization against any further totalitarian intervention." (Koolhaas 170)

The largest area that a builder would be able to have complete architectural control over would be the block, thus becoming the "maximum unit of urbanistic ego."(Koolhaas 170) With the grid as the unit of development, developer's intentions over the course of the 20th century would be to maximize the largest plot of land possible. In a summarized timeline one would be able to see this transition in the construction of many of Manhattan's iconic buildings. The early 1900s saw a boom in construction, with many buildings extruding their purest site extents as high as they could go. The Flatiron Building, originally called the Fuller Building epitomized this concept of pure extrusion. Enabled by the use of the newly developed steel framework construction, the tight triangular site was extruded to a height of 12 stories by architect Daniel Burnham in 1902.



(6) Pure extrusion of site made possible by steel frame construction and the elevator. Fuller (Flatiron) Building, 1902

Between 1900 and 1916 the simple extrusion of a site would reach greater and greater proportions, eventually with the construction of the Equitable Building in 1915. With an extrusion of the entire block, dubbed the first City within a City, the Equitable would raise concerns over its size. In the simple extrusion of the entire block to 39 stories, the surrounding environment began to suffer, both financially and environmentally. Its shadow reduced rents in a vast surrounding area of properties (7 acres), and its massive interior lobby pulled pedestrians from the street creating a surrounding ghost town. The concerns on the destruction of its surroundings presented the necessity for some form of building restriction to be implemented, and this would come in the form of the 1916 Zoning Law. The 1916 Zoning Law was adopted primarily to stop such massive buildings as the Equitable building in lower Manhattan from being constructed. The law described an invisible outline of the maximum allowable construction of a new building; allowing the sheer multiplication of the site only up to a certain height. The building would then need to be stepped back from the plot line at a certain angle to admit light to the streets, only allowing 25 percent of the plot area to be wholly extruded. This rule would further enforce developer's ambitions of acquiring the largest possible tracts of land in an effort to maximize their towers footprints. Whereas the grid foreshadowed all future development to the confines of its streets, in the same manner the 1916 Zoning Law thus created a ghost-plan for the rest of the future development of all of Manhattan's 2,028 blocks in the vertical realm. After 1916 no buildings constructed in Manhattan could exceed the limitations of this ghost shape. To turn maximum profit on any development Manhattan's architects would need to match the regulatory profile as closely as possible.



(7) Full conquest of the block with detrimental consequences,
Equitable Building, 1913

In an effort to better relay the consequences of the zoning law to New York's architects Hugh Ferriss, an architectural delineator was commissioned by architect Harvey Corbett to draw some perspectives portraying the changes. His sketches, an original 4 and many other supplementary images would eventually be compiled into his 1929 book *The Metropolis of Tomorrow*. These sketches would form the basis for construction over the next 50 years, with many of today's famous skyscrapers matching the same wedding cake stepped profile to which Ferris gave vision to.



(8) 1916 Zoning Law setbacks by Hugh Ferris

Many of the principals of the 1916 Zoning Law were not able to withstand the ever-changing degree of density and urban development to which New York was subject to, and many amendments were made over the years. A number of critical factors were responsible, including constant immigration and population increase, new transit routes, the introduction of government housing and development programs, also known as urban renewal, and more prominently than anything else the rise in automobile usage. These modern changes were mirrored in the progression of skyscraper design as well. Whereas over the first half of the 20th Century saw buildings reflecting their neoclassical predecessors in appearance, after World War 2 modernism and the rise of the international style would give way to many new types and visions of skyscraper typology.



(9) Wedding cake buildings as a result of the 1916 Zoning Law, New York

At the forefront of this movement were architects like Mies van der Rohe and Le Corbusier, whose contemporary designs opened the doors for new experimentation in design. The Seagram Building built in 1958 by Mies van der Rohe in New York is highly regarded as a pinnacle of this architectural movement. The core elements of the design focused on the use of glass curtain walls and articulated structural elements. Another significant feature of the building was a setback from the street to create a public plaza. Mies' intention of introducing a public gathering space became such a success that in 1961 the City of New York enacted a major revision to the 1916 Zoning Resolution. The Resolution focused on using Floor Area Ratio (FAR) regulations instead of setback rules, and also on the creation of open space, rewarding developers who would provide adjacent public space with increased allowable floor sizes. This introduction of privately owned public spaces would become a drop in the pond of the ongoing dialogue in the architectural world between planners, developers, and thinkers over the course of the 20th century about public space and its impact within urban design.



(10) Seagram Building, 1960s Mies Van der Rohe

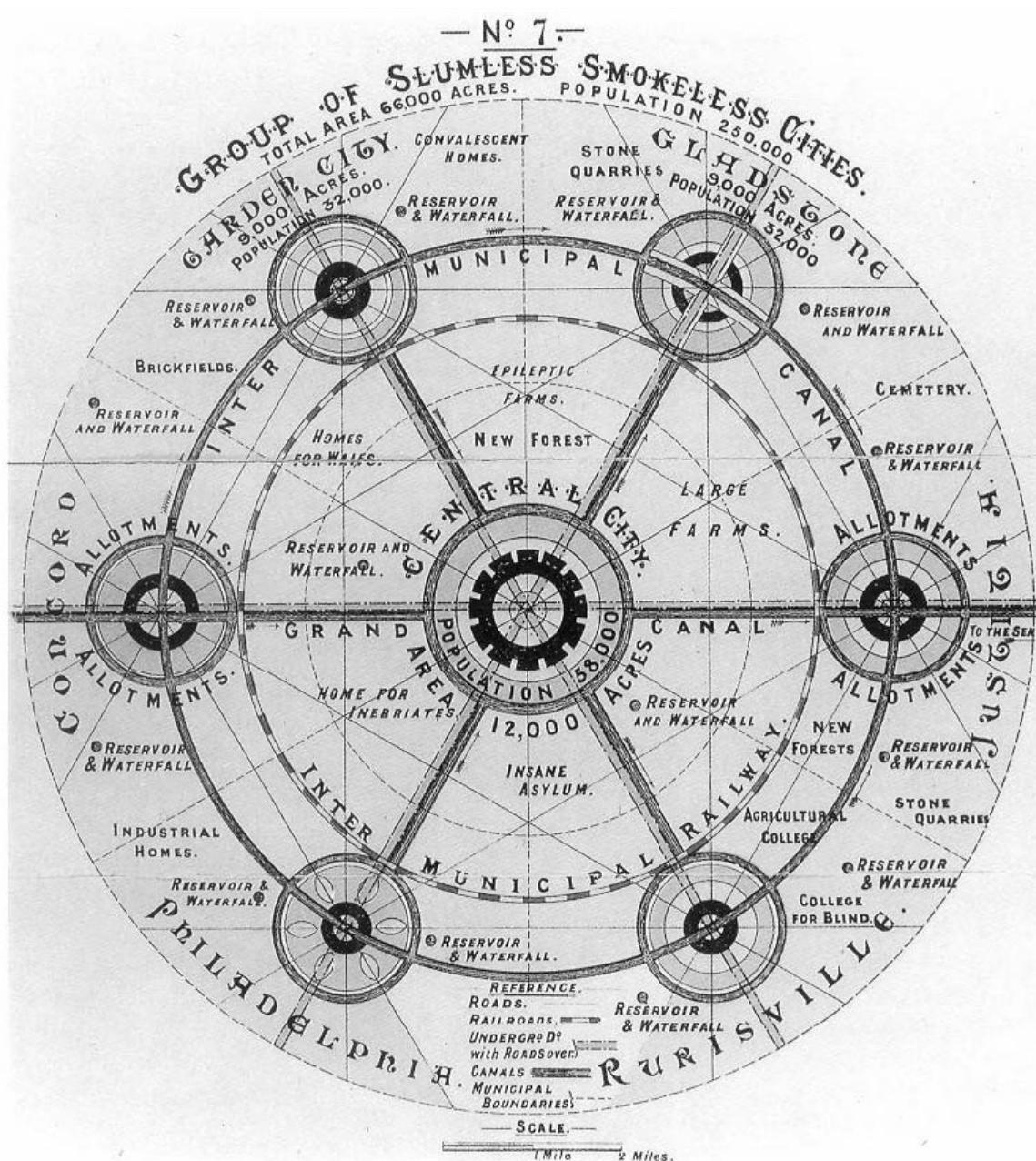
Part 2:
The Skyscraper and the
Urban Environment

City Planning Principles

As a result of the congested disease filled dwelling conditions of late 19th century industrial London, urban planner Ebeneezer Howard put forth a utopian idea for a new city model in his 1898 book *Tomorrow: A Peaceful Path to Real Reform*. The foundation of his proposal was to offer an alternative to the city, proposing a series of mid-density self-sustaining towns which would form a network between each other. Called Garden Cities, these small towns with a population cap of 30,000 inhabitants each would be divided radially between industry, commercial, and living by agricultural greenbelts.

“The image was the English country town – with the manor house and its park replaced by a community center, and with some factories hidden behind a screen of trees, to supply work.” (Jacobs, Jane. *The Death and Life of Great American Cities*. New York: Vintage Books, 1992, Print.104)

Dividing this city’s functions into separate self contained units, the ultimate premise of his scheme would be to never let these towns become cities. Unbeknownst to him, his ideas would inform many of the future principles of urban planning over the coming century.



(11) Ebeneezer Howard, Garden City

Le Corbusier

Le Corbusier, an architect in Paris also looking to propose an alternative to the industrial city, would take Howard's Garden City scheme to another level in his ongoing proposals through the 1920's for high density living. In his "City for 3 Million" he took the same principle of Howard in providing ample green space, except instead of sprawl he proposed building vertical.

"We must increase the open spaces and diminish the distances to be covered. Therefore the centre of the city must be constructed vertically." -Le Corbusier
(LeGates, Richard T., and Frederic Stout. *The City Reader*. London: Routledge, 1996. Print.320)

His proposal introduced a model of "Towers in a Park", large monolithic "super-blocks" providing ample green space in between. With a great emphasis on the future of the automobile in this futuristic city, the project contained an elaborate framework of hierarchically submerged road networks, reducing crossroads, increasing 1-way express traffic, and keeping the parks free for pedestrians only.

"Our fast car takes the special elevated motor track between the majestic skyscrapers: as we approach nearer, there is soon the repetition against the sky of the twenty-four skyscrapers; to our left and right on the outskirts of each particular area are the municipal and university buildings. ...The whole city is a Park"

-Corbusier (LeGates.)

His Cartesian skyscraper model would powerfully set into motion a vision for the next generation of urban design, appearing in countless American and European cities around the world. Unforeseen at the time however this model would prove to be detrimental in many of the cities to which it was applied. A prominent example of this would come in the urban development programs in New York City



(12) Le Corbusier, Unite d'Habitation, 1947



(13) Le Corbusier, The Plan Voisin, 1922-25

Robert Moses vs. Jane Jacobs

Urban renewal is a program of land redevelopment in areas of moderate to high-density urban land use. It involves the relocation of businesses, the demolition of structures, the relocation of people, and the use of eminent domain (government purchase of property for public purpose) as a legal instrument to take private property for city-initiated development projects. Today it has evolved into a policy based on renovation and investment; however during the 1940s it was an intense process of destruction and relocation in the name of rebuilding the city. In 1949 President Truman signed the National Housing Act creating a federal program called Urban Renewal. The goal was to replace chaotic old neighborhoods deemed as “slums” with planned new communities. The new housing was to be built not by the government but by private companies handpicked by the city. The city could condemn a piece of property and turn it over to a private individual. Robert Moses, head of the slum clearance committee, was the man in power. He became infamous for his shaping of the city of New York, and is often compared as the Baron Haussman (Paris) of New York. He is responsible for conceiving and implementing numerous construction plans, creating 100s of miles of parkways and expressways which would connect the city to the suburban reaches of Long Island and beyond, which as he said in doing so would be, “weaving together the loose strands and frayed edges of the metropolitan arterial tapestry.” Moses directed the construction of new bridges, highways, housing projects, and public parks.



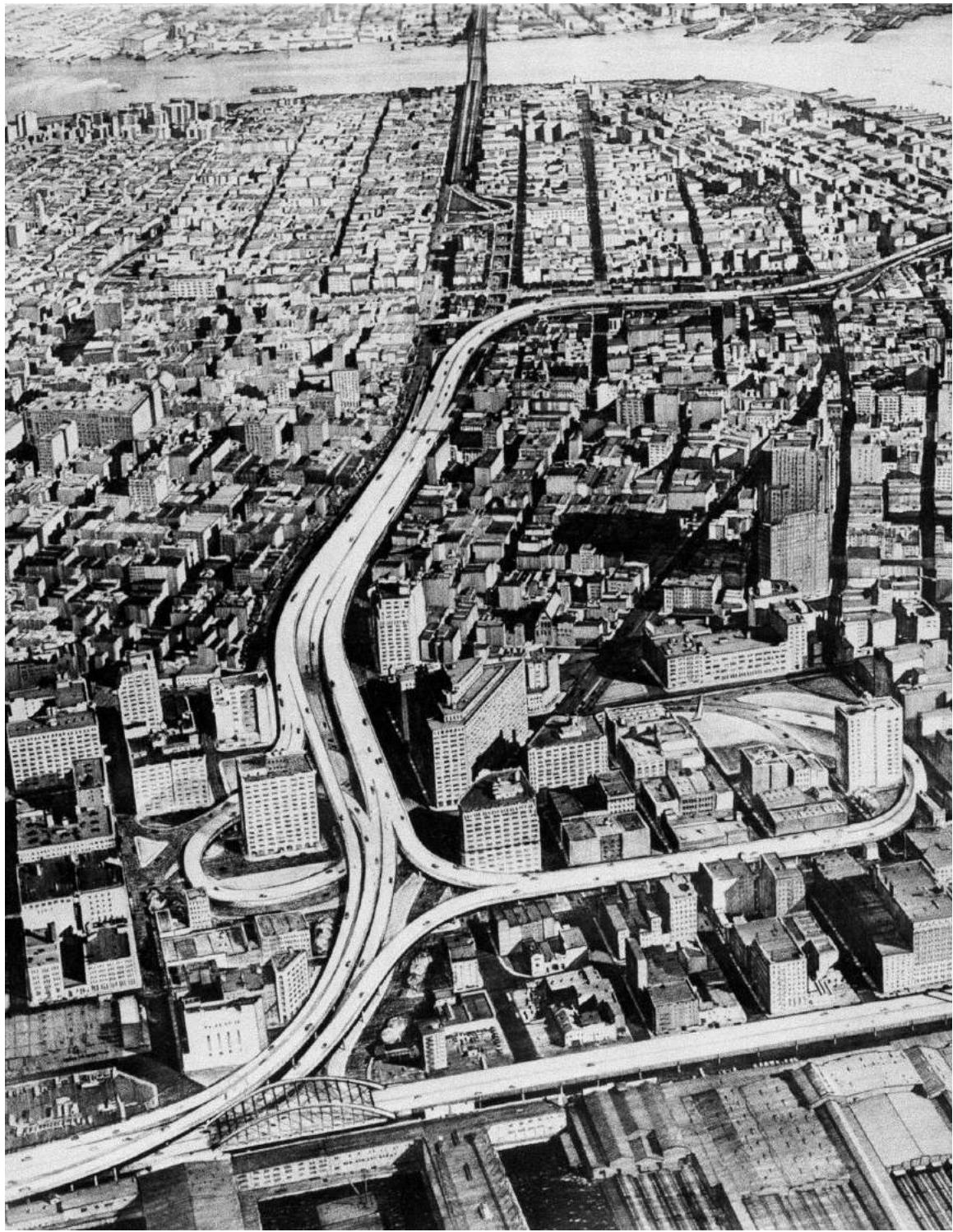
(14) Infrastructure takes precedent. Robert Moses, plans for Manhattan-Brooklyn Bridge 1930s

As head of the slum clearance committee, along with a whole slew of self-created public authorities, he carried the right to decide which contracts would go to whom, and which areas of the city were ultimately in need of “un-slumming.” In 1961, Moses was quoted,

“We simply repeat, cities are created by and for traffic, a city without traffic is a ghost town. The area between Canal Street and Third Street, a strip $\frac{3}{4}$ of a mile wide is the most depressed area in lower Manhattan, and one of the worst, if not the worst slums in the entire city.” (Mugdocka. “Jane Jacobs vs Robert Moses: Urban Fight of the Century.” YouTube. YouTube, 13 Feb. 2012. Web. 01 Apr. 2016)

With Moses’s condemnation of the East Village as a slum, Moses put forth 2 initiatives for its urban renewal. He proposed an immense urban renewal project in Greenwich Village along Hudson Street, along with an 8 lane elevated highway to connect the East River to the Hudson through lower Manhattan. His proposals would call for the relocation and demolition of over 14 blocks and 10,000 residents and workers. He not only wanted to propose this highway, but also wanted to build 3 across Manhattan: an elevated expressway in mid Manhattan on 30th street, and a surface level expressway on 125th street. With this drastic proposal to cut off and through lower Manhattan, came much opposition, and at the forefront of this public disapproval of the proposal stood Jane Jacobs. Acting not only as a writer and critic on the issue, she became the face of opposition and ultimate victor against Moses. Jacobs had just published her own book that same year, entitled *The Life and Death of Great American Cities*. In her book she took a bold and cynical stand against the planning principles which had been prevailing around her. Addressing a myriad of issues, including the denunciation of contemporary large-scale urban renewal, practiced planning policies, and the

dominating culture of the automobile, her book would become one of the most prominent urban planning guidelines which we use today.



(15) LOMEX, Lower Manhattan Expressway proposal. Rejected in 1964 due to public outcry

At the crux of her argument, the main thesis of her book stood this point. The urban planners and developers had been missing the point, focused too much on big plans and massive infrastructural overhauls rather than on the true identity of the existing city streets. The value of the city block and the vitality of the life that currently existed within the urban spaces of Manhattan was going to be destroyed with the notion that the new was always better than the old and that the automobile was precedent over all. Jane Jacob's famous criticality of the issue could be summed up in this famous quote;

"Under the seeming disorder of the old city, is a marvelous order for maintaining the safety of the streets and the freedom of the city. It is a complex order. Its essence is intricacy of sidewalk use, bringing with it a constant succession of eyes. This order is all composed of movement and change, and although it is life, not art, we may fancifully call it the art form of the city and liken it to the dance — not to a simple-minded precision dance with everyone kicking up at the same time, twirling in unison and bowing off en masse, but to an intricate ballet in which the individual dancers and ensembles all have distinctive parts which miraculously reinforce each other and compose an orderly whole. The ballet of the good city sidewalk never repeats itself from place to place, and in any once place is always replete with new improvisations." (Jacobs.153)

Whereas the current city planning principles had believed that the implementation of Corbusier's Cartesian skyscrapers and the Radiant Garden City model of decentrist planning would create successful urban environments, Jacobs vied for principles directly opposite of such. Instead of sending citizens off to the suburbs, she believed that the key to a successful city would be in better understanding and maximizing the diversity and complexity of the current urban conditions already in place. Based on her own observations as a New York resident, her seminal book proposed 4 key qualities vital in creating a healthy, vibrant city.

1. Various types and ages of buildings.
2. A high concentration and density of uses.
3. Mixed uses, not just all one kind of thing.
4. Frequent streets and very few long blocks.

These qualities have widely become respected as vital city planning principles, and as later discussed the application of these within the high-rise proposal for Battery Park will prove to be essential to its success.



(16) Jane Jacobs, *The Death and Life of Great American Cities* (1961)

Part 3: Proposal



(17) Site, Lower Manhattan

The location on the southern tip of Manhattan Island is a prime location in which to provide this connected skyscraper proposal. The existing urban fabric is disjointed and isolated. From the tourist-infested areas of the Ground Zero Memorials and Battery Park, the conditionally active Financial District, and the isolated residential neighborhood of Battery City -- each area has been cut off from its surroundings either from a lack of programmatic diversity or through arterial separation. Battery Park Tower can reinvigorate these zones by connecting the crucial points of interest which have been left isolated from each other over time. The strategy for this means of connection is one which is incredibly site specific, based on a careful analysis of the current conditions of the site and its surroundings, as well as the strategic execution of design and layout. The result is one of a true vertical city, which will draw all facets of public within, not only activating the existing urban fabric but also creating a successful livelihood within. In a very literal translation, the implementation of a successful vertical city can be directly related to the layout of a successful city street. It is in this way that in taking the successful city planning principles used today and applying them vertically one can offer a truly vertical city.

Strategic Program Placement

Introducing a wide range of program is vital to creating diversity and livelihood, in a successful city neighborhood and likewise within a vertical skyscraper. The district, and indeed as many of its internal parts as possible, must serve more than one primary function; preferably more than two. These must insure the presence of people who go outdoors in different schedules and in the place for different purposes, but who are able to use many facilities in common. On a successful city street people must appear at all times of the day for different purposes and reasons. It is this diversity, as mentioned in Jacob's famous quote "The Ballet of the Sidewalk" which makes each part work in unison. Jacobs summarizes this complexity of interdependence;

"For a humble example of the economic effects of people spread though time time of day, I will ask you to think back to a city sidewalk scene: the ballet of Hudson Street. The continuity of this movement (which gives the street its safety) depends on an economic of basic mixed uses. The workers from the laboratories, meat-packing plants, warehouses, plus those form a bewildering variety of small manufacturers, printers, and other little industries and offices, give all the eating places and much of the other commerce support at midday. We residents in the street and on its more purely residential tributaries could and would support a modicum of commerce by ourselves, but relatively little. We possess more convenience, liveliness, variety and choice than we 'deserve' in our own right. The people who work in the neighborhood also possess, on account of us residents, more variety than they 'deserve' in their own right. We support these things together by unconsciously cooperating economically. If the neighborhood were to lose the industries, it would be a disaster for us residents. Many enterprises, unable to exist on residential trade by itself, would disappear. Or if the industries were to lose us residents, enterprises unable to exist on the working people by

themselves would disappear."(Jacobs.153)

While we know that a mixture of uses can create a successful codependent relationship, thereby increasing the economic activity and livelihood of an area, this recipe is not always present in city centers. A prime example of this, the location of this proposal, is the Central Business District of Manhattan, also known as the Financial District. This region of Manhattan suffers from this exact problem, an extreme time-imbalance of which leaves the entire district vacated at night. More than 400,000 people are employed within the District, yet proportionally in relation to other cultural and amenity services is lacking. This unbalance has become characteristic to the area, the most crucial factor being the lack of mixture of uses. There are two kinds of uses which contribute to the kind of diversity which the FD lacks, and these are primary and secondary uses. Primary uses are those which are absolutely necessary to a particular area. These can include offices, industry, residential, entertainment, education, and recreation, even cultural and educational facilities like museums, libraries, and galleries. By introducing each of these kinds of uses/program within the high-rise skyscraper, many of the necessary factors to creating a successful vertical neighborhood can be achieved. The arrangement and placement of these programs will therefore prove to be of imperative importance, much like the location of particular programs and services is imperative on street level.

The Vertical Street

Another vital element in the creation of a successful city neighborhood is the street itself. The street becomes the meeting ground for the general public, a place where unknown and unexpected interactions can occur. In order for a street to thrive, there needs to be constant opportunities to turn corners. Long blocks, such as those of the upper West side of New York segregate the community and prevent interaction between neighboring streets. The premise is simple, more streets or cross points in circulation mean more opportunities for liveliness and public interaction. In a vertical high-rise, what is the equivalent of a street? A figurative kind of street, the corridors or hallways within a high-rise can serve the same purposes as a public street. In this sense the hallway or atrium, at whatever size it is becomes one of the most important areas within the high-rise from which the “public” of the building will use. A well used city street must have these three main qualities as suggested in Death and Life:

- 1) Must be a clear demarcation between what is public and what is private.(Jacobs.35) Within a multi-programmed high-rise the demarcation between what is public space and what is private space is crucial in having successful circulation and navigation. With an incredible amount of program all situated together, there must be the equivalent of a clear sidewalk (boundary) between the circulation routes and each individual program which desires to retain its privacy.
- 2) Must be eyes on the street. “eyes belonging to those we might call the natural proprietors of the street. The buildings also cannot turn their backs or blank sides on it and leave it blind.(Jacobs.35)

The thoughtful layout and arrangement of program is vital to the buildings successful operation, both financially and operationally. If the public does not desire to freely roam throughout the building, leaving particular access corridors or areas neglected, the building’s stability may suffer. The successful placement

of what in consumer economies calls “market goods” should ensure public procession through all targeted areas of the buildings public spaces. Market goods in terms of a market economy are the essential goods which the public is guaranteed to be looking for when shopping. Stores intentionally place these market goods in strategic locations with “impulse goods” in the way, enticing impulse buys from shoppers en-route. The equivalent within a high-rise development would be the insertion of program which will not hinder the public but provide an added value to their experience throughout the building.

3) “The sidewalk must have users on it fairly continuously, both to add to the number of effective eyes on the street and to induce the people in buildings along the street to watch the sidewalk in sufficient numbers. Nobody enjoys looking out a window at an empty street. Large numbers of people entertain themselves, off and on, by watching street activity.”(Jacobs.35)

By placing public spaces at intervals between programs, a kind of forum, or “intersection” is created. Much like people often sit in a café or park by a busy street to watch people, the use of grand public stairs, or zones in which people will be in constant motion will ensure a spectacle is always in procession.

A Vertical Park

A neighborhood park holds the ability to become beneficial feature and economic asset within the city or the exact opposite. Their success is drastically affected by the way the surrounding parts of the city act upon them. Drawing from the same reasons which make a city street successful, a successful park needs to be situated in a location which provides a diversity of functions and uses, thereby increasing the diversity and intricacy of use by differing people and their schedules. There needs to be a diverse mix of work, cultural, residential and commercial activity to ensure that a park becomes used throughout all times of the day and by all different types of people. The more successful this mixture, the more successful the park. Introducing a neighborhood park within a skyscraper proves to be a difficult challenge, however this introduction within the program of the building can act as the supporting glue which may bring all facets of life within the building together. The strategic placement, size, and proximity of a public green space in relation to the other programs and functions of the building may prove to be one of the vital elements which make the building a success. Utilizing the proximity of Battery Park and its excessive use by tourists, a vertical park within the skyscraper will provide a complementary addition to the surroundings, not only in its ability to provide the public beautiful views towards each part of Manhattan, but also economically for the program within the skyscraper itself. A constant flow of the general public within the building to reach the park will activate each of the other assets of the building, essentially creating a vertical street. With the proximity of Battery Park just across the street, the most successful integration or depiction of a park will come in the form of a public sky lobby. Accessible to all tenants and occupants within the building, the sky lobby will act as an urban park.

Vertical, Horizontal, and Vertical Again

Over the last half century we have seen a general convergence of the 2 basic principles as previously discussed, the nature of the skyscraper as a pure repetition of disconnected floor plates and urban design principles like program diversity and public space as a means of connection. Numerous examples have emerged in the last 50 years, 2 good examples of which being Norman Foster's 1986 Hong Kong and Shanghai Bank Headquarters in China implementing a grand connecting atrium within, and Skidmore Owings & Merrill's 1969 John Hancock Centre as a vertical city stacking multiple programs on one another.

Although the model of a vertical city has greatly increased in use in recent times, mostly as a factor of ultra high skyscrapers needing some form of horizontal datum throughout, this growth has been very slow within a generally constrained framework. The idea of a three-dimensional urban typology where elevated spaces may carry some of the same character and vitality as the kind of spaces found at street level has remained an idea not yet achieved. A great model in which to look at this vertical challenge can be in reference to the afore mentioned Downtown Athletic Club and Rem Koolhaas' own architectural proposal for the Parc de La Villette. In a poetic dissection Koolhaas describes his park project like so; "If the essence of Delirious New York was the section of the Downtown Athletic Club – a turbulent stacking of metropolitan life in ever-changing configurations; a machine that offered redemption through a surfeit of hedonism; a conventional, even boring, skyscraper; a program as daring as ever imagined in this century – La Villette could be more radical by suppressing the three-dimensional aspect almost completely and proposing pure program instead. Unfettered by any containment. In this analogy, the bands across the site were like the floors of the tower, each program different and autonomous, but modified and “polluted” through the proximity of all others. Their existence was as unstable as any regime would

want to make them. The only “stability” was offered by the natural elements – the rows of trees and the round forest – whose instability was ensured simply through growth. What La Villette finally suggested was the pure exploitation of the metropolitan condition: density without architecture, a culture of “invisible” congestion.”-OMA Website

gle and collide. In an ironic reversal, it is this exact framework when thesis boils down to. By breaking down the barriers of what the skyscraper has typically meant in construction, a new skyscraper which stitches together its inner parts can provide a new reality within high-rises of the future. Whereas the vertical realm has historically been one of privacy and disconnection, the expansion of the public realm into all facets of vertical living will prove to be a groundbreaking new way of high-density living in the cities of tomorrow. The success of such a methodology will ultimately come down to the inseparable conditions of the site and context to which it addresses. The high-density's which would facilitate such a livelihood in the vertical realm are limited to major cities across the world, and it is through a critical and strategic analysis of these cities in which a proposal of this kind could be implemented successfully.

Part 4:
As Presented



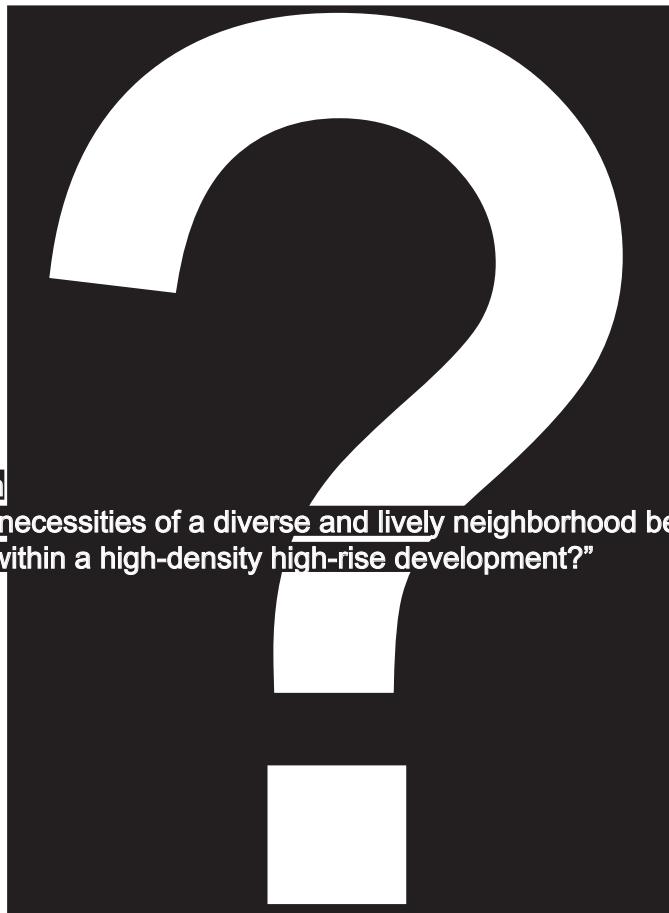
Purpose

Looking at the current condition of the skyscraper in high density cities we see a lack of publicness, connectivity, and diversity



Intention

This thesis will provide a skyscraper proposal for New York's Financial District, one which addresses these characteristics, blending the line between public vs private, and rewriting a script for urban space and its identity within a city skyscraper."



Question

Can the necessities of a diverse and lively neighborhood be encapsulated within a high-density high-rise development?"



“Basically the consocial dimension of the skyscraper is rarely exploited and it's all about height.”

“The life of the city is the ballet of the sidewalk”



Mixed use 2.0

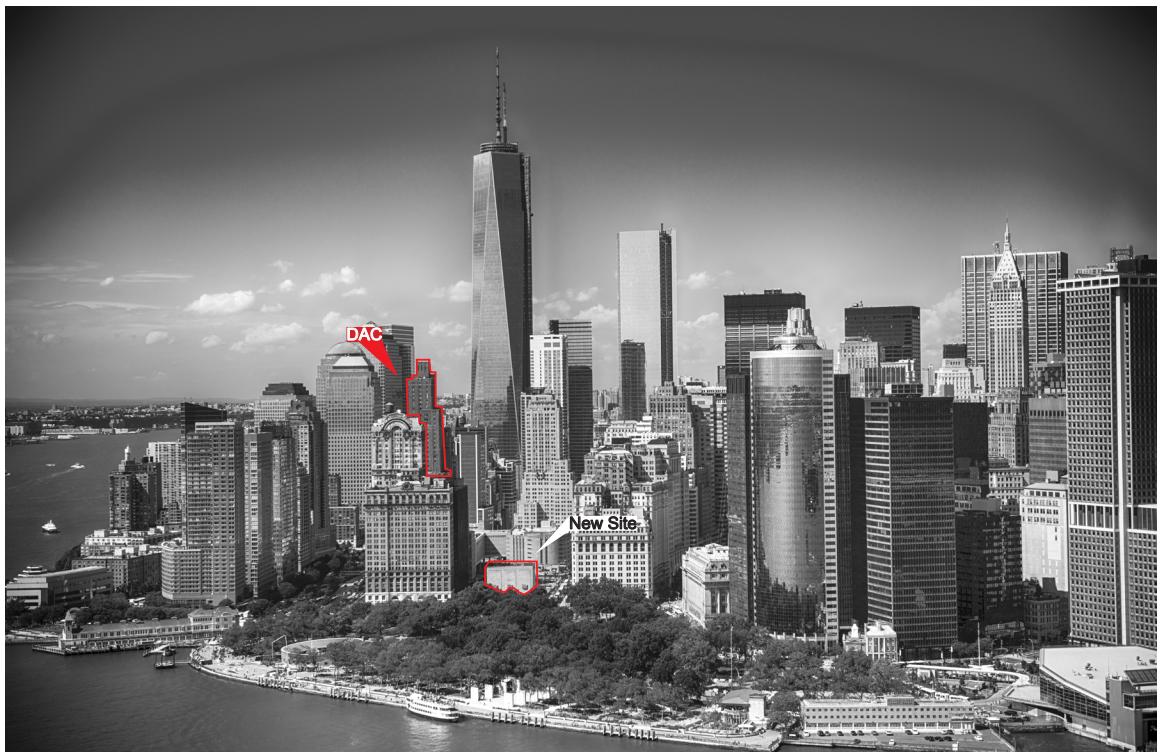


“We have to find a way to deploy towers in a way that creates additively, collectively, public place, public realm. We haven't learned how to do that.”

“Architecture is making sure that our cities and buildings fit with the way we want to live our lives.”





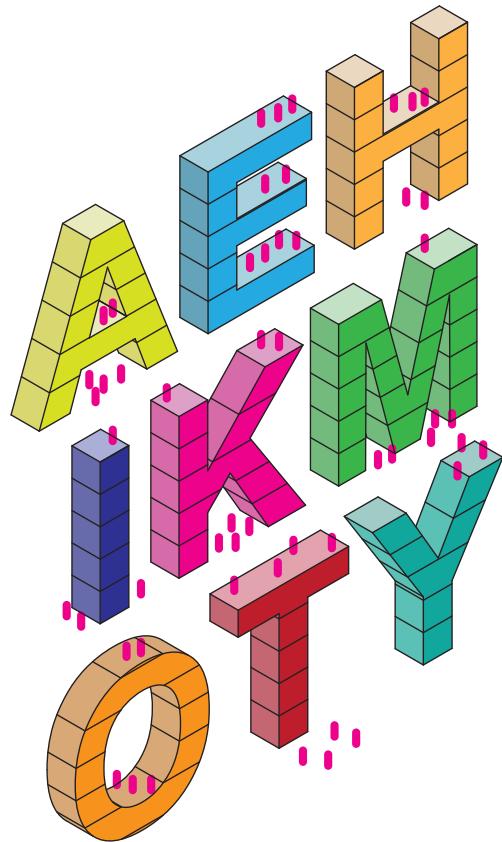


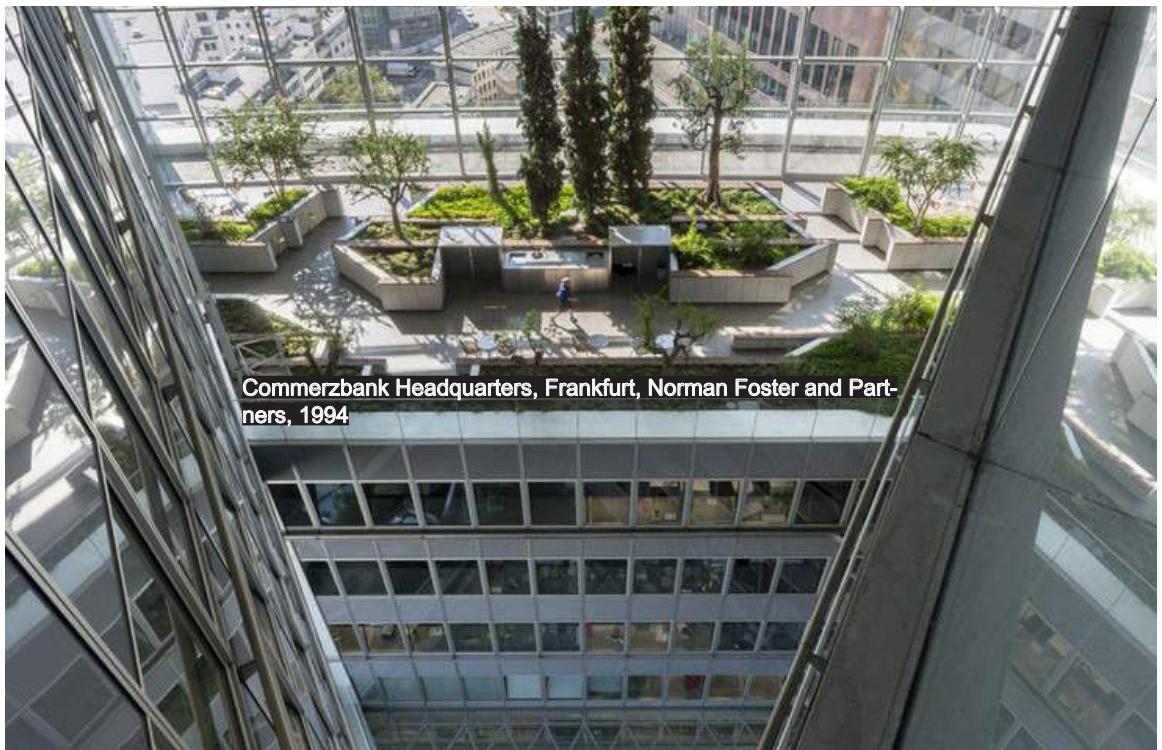


Hong Kong and Shanghai Bank Headquarters (HSBC), Norman Foster & Partners, 1979-86

(18) HSBC

Public Space/Open Space

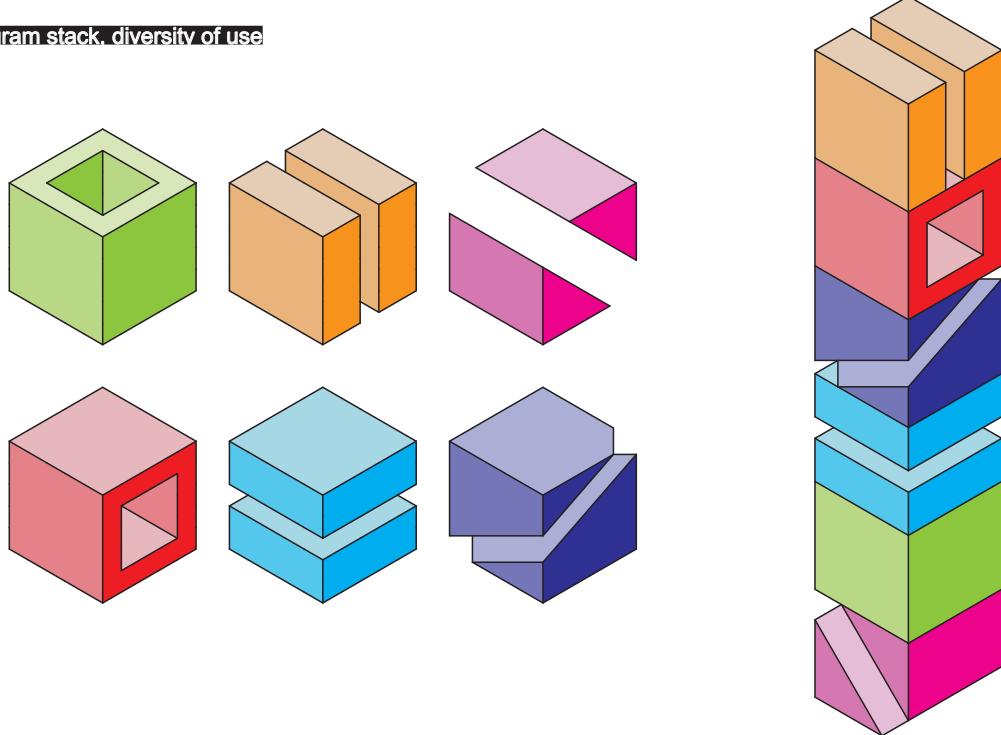


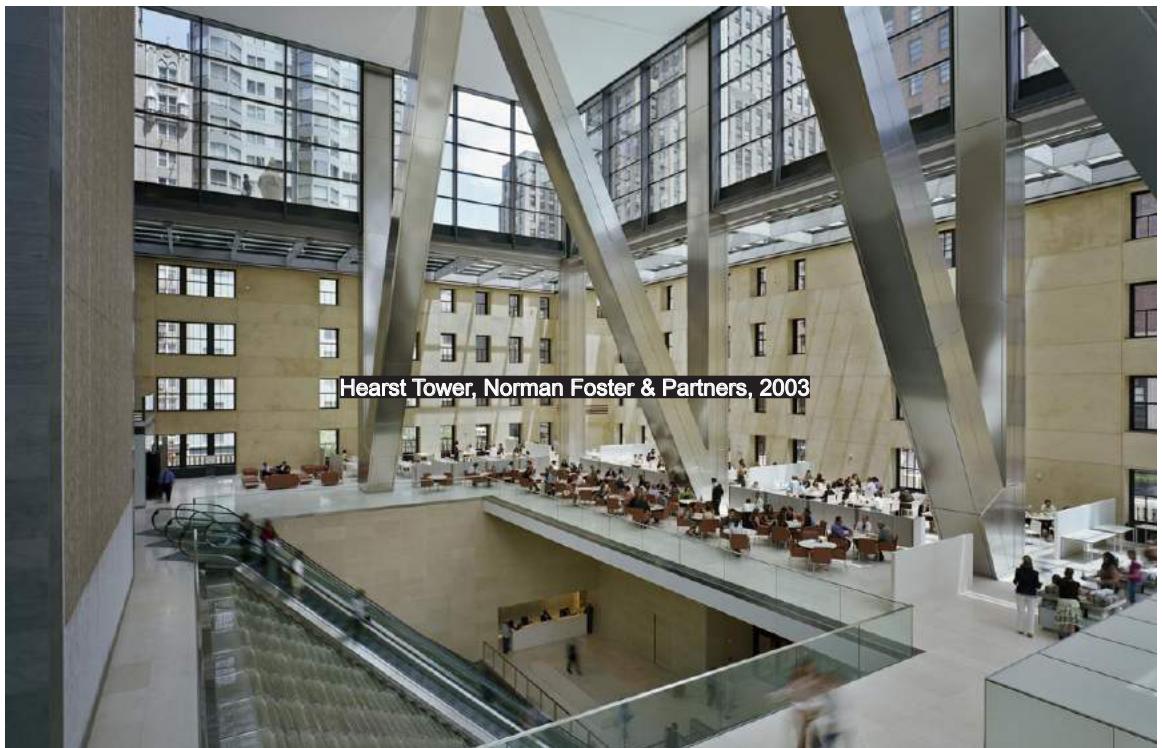


Commerzbank Headquarters, Frankfurt, Norman Foster and Partners, 1994

(19) Commerzbank HQ

Program stack, diversity of use

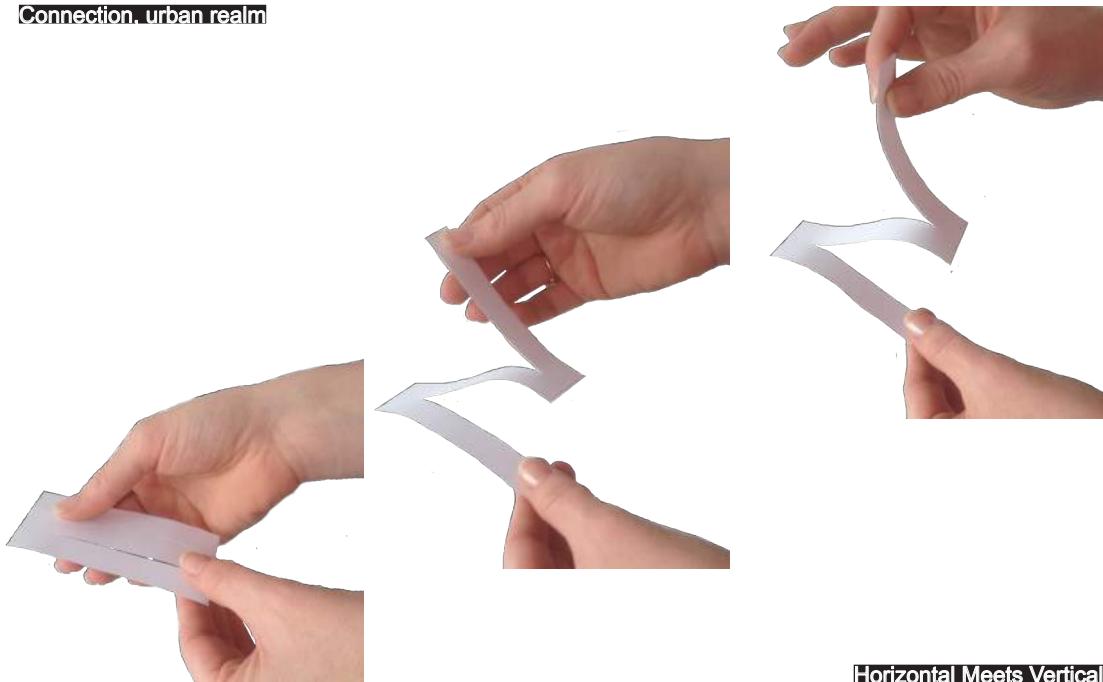




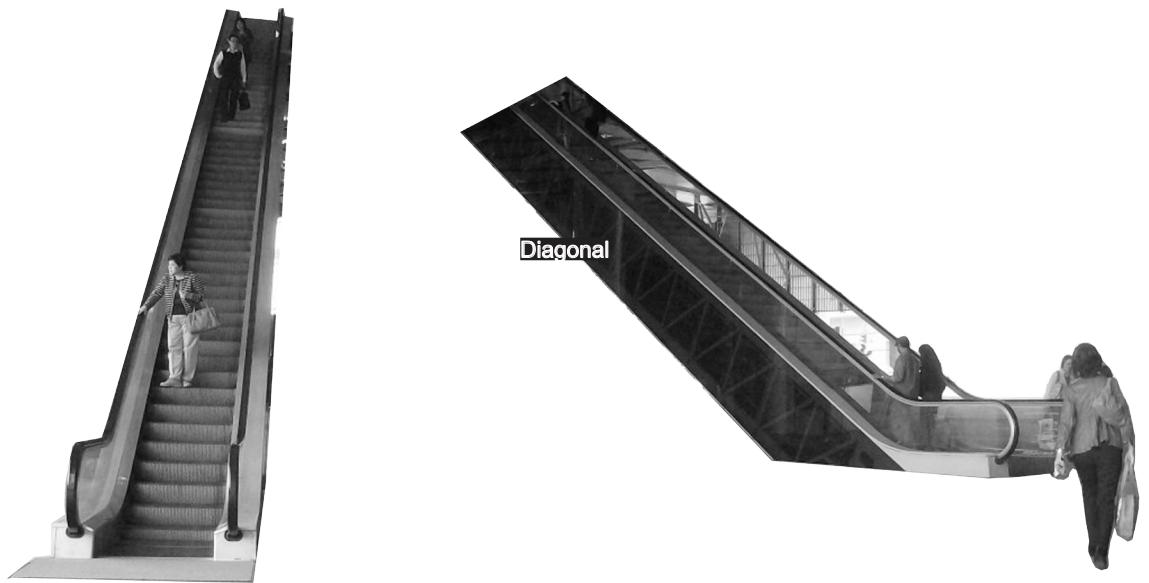
Hearst Tower, Norman Foster & Partners, 2003

(20) Hearst Tower

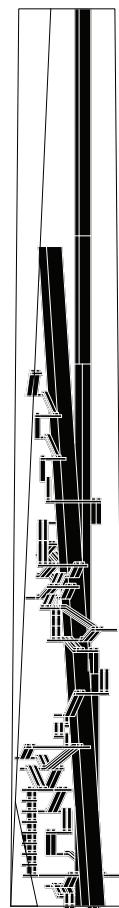
Connection, urban realm



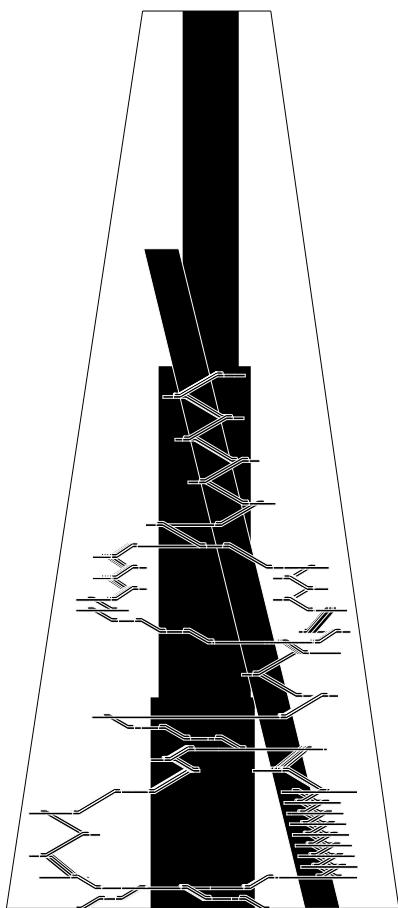
Horizontal Meets Vertical



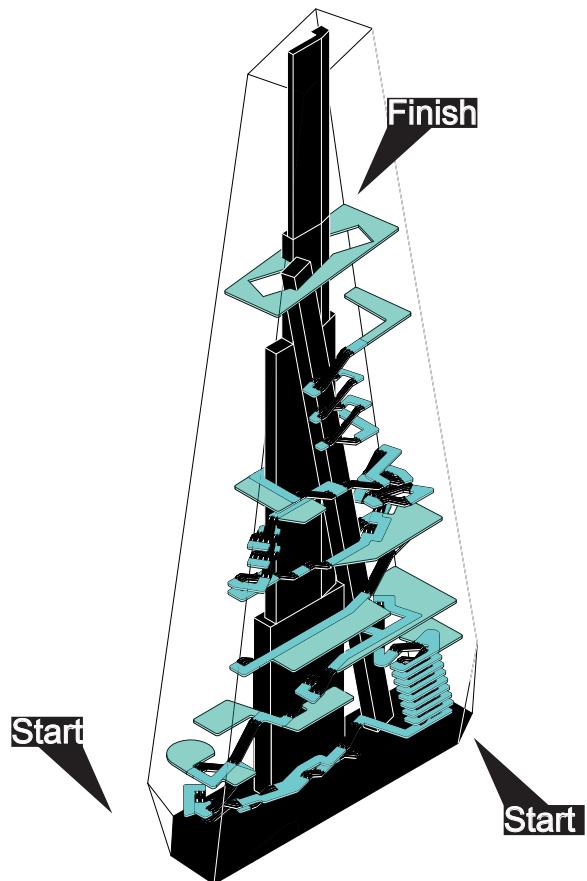
Vertical Streets. 4 tiers



Standard elevator core, express diagonal glass elevator, escalators, stairs, horizontal



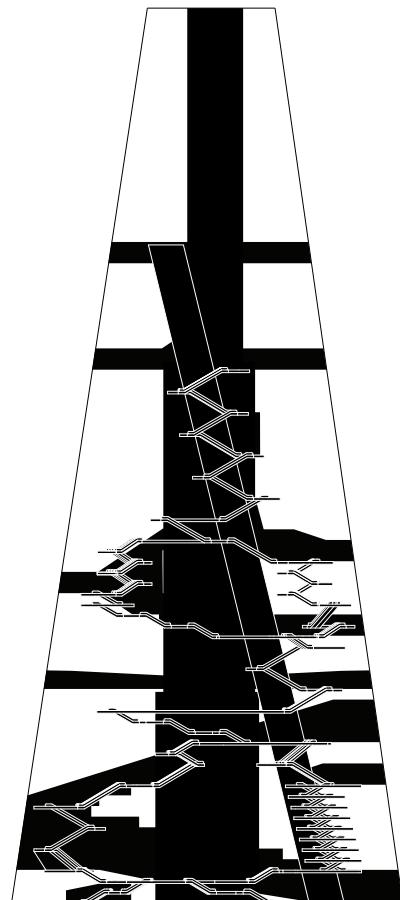
4 tiers of connection



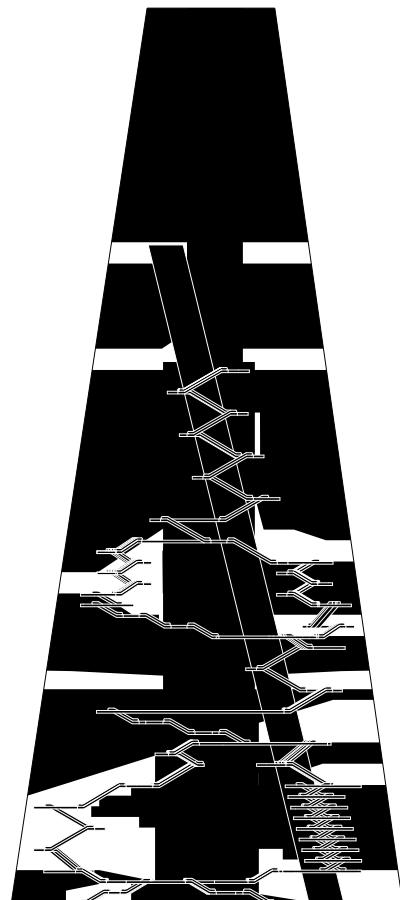
4 tiers of connection



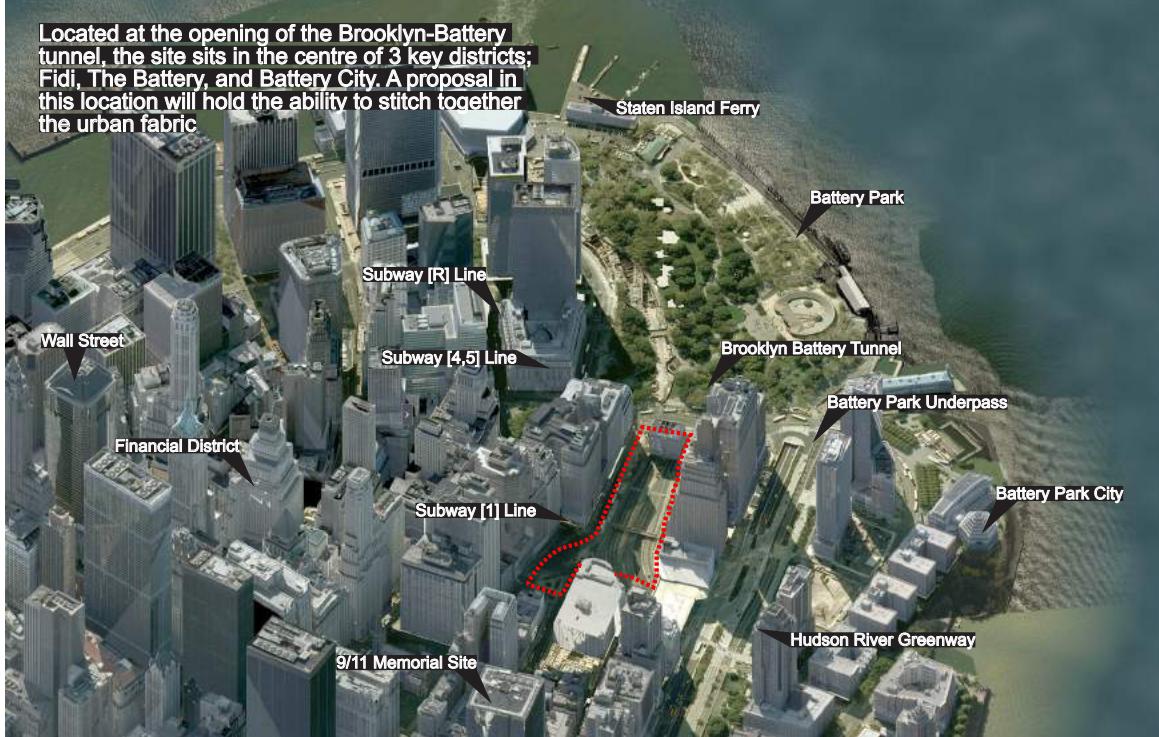
Program Overlay



Program Overlay

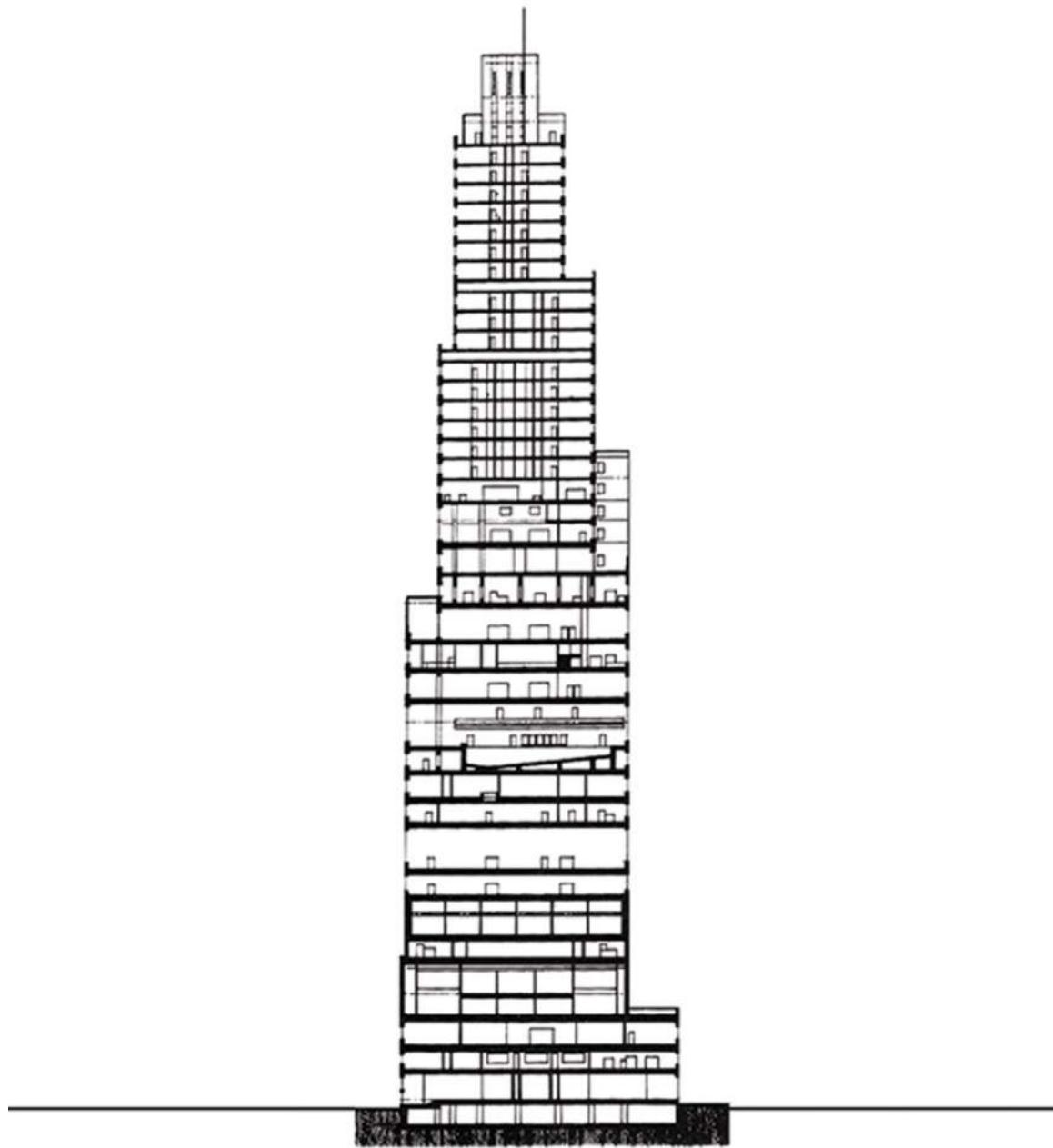


Located at the opening of the Brooklyn-Battery tunnel, the site sits in the centre of 3 key districts; Fidi, The Battery, and Battery City. A proposal in this location will hold the ability to stitch together the urban fabric

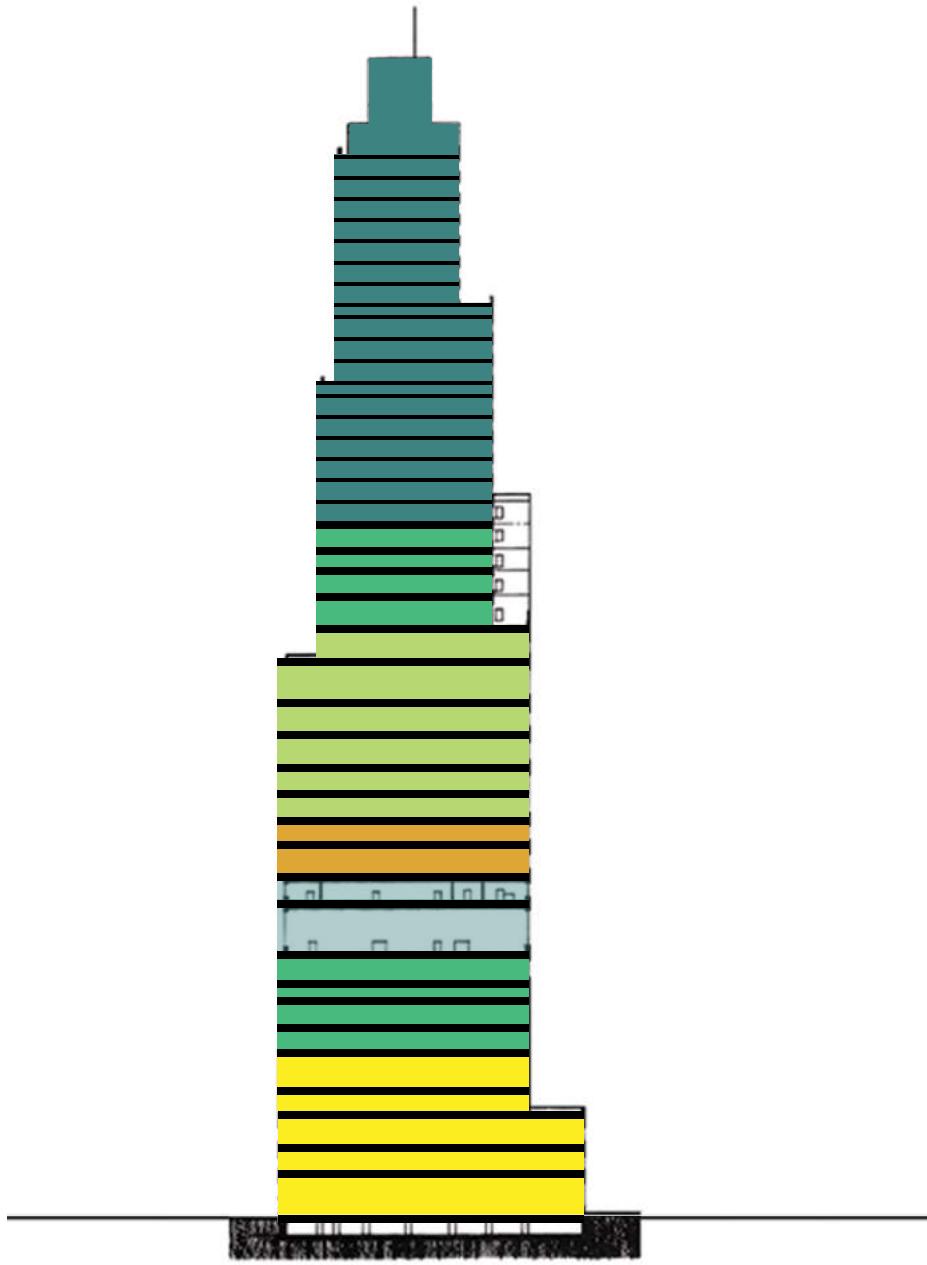




DAC Section, an alternate reality on every level



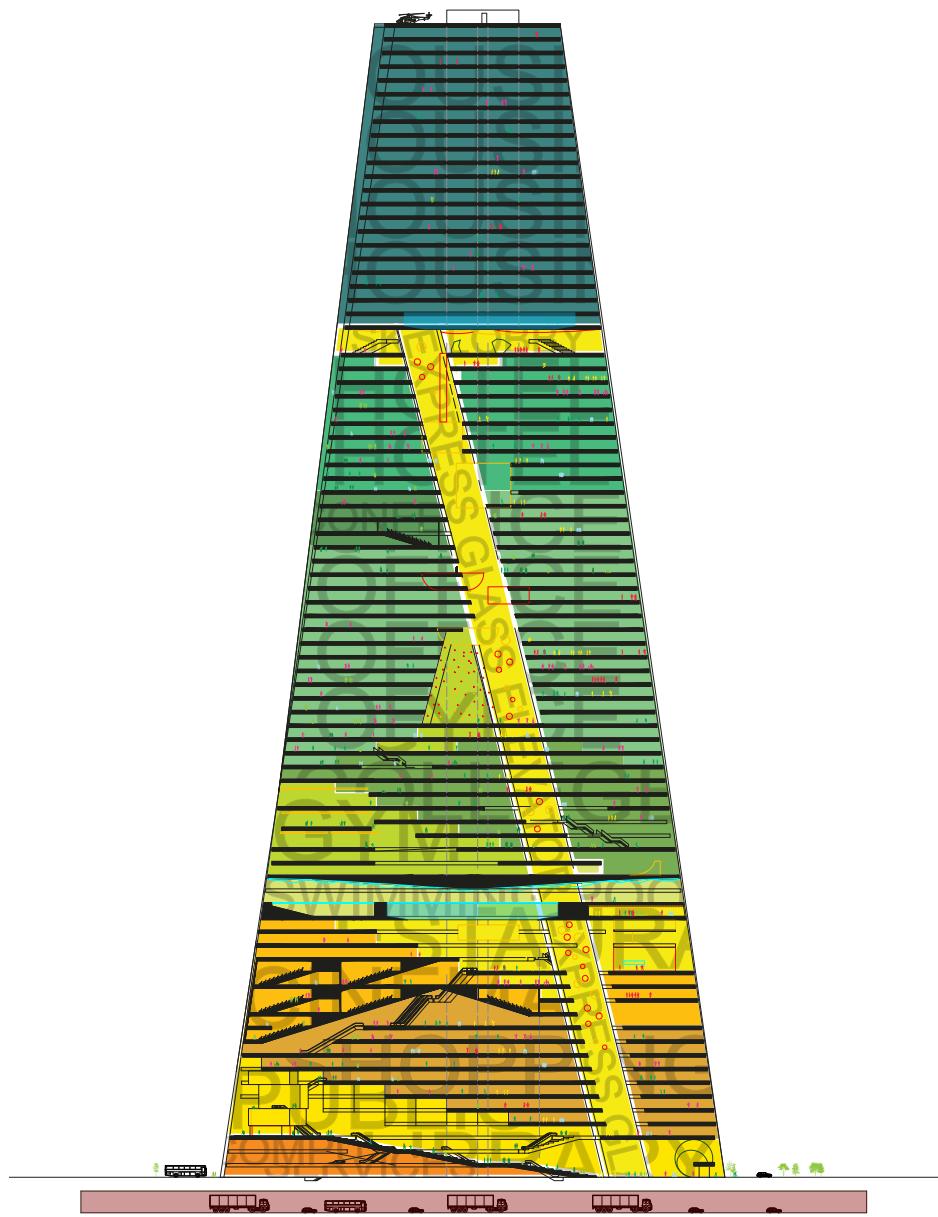
DAC Section, an alternate reality on every level



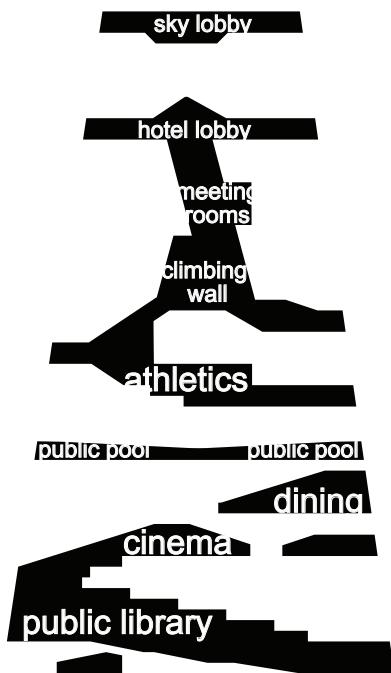
Program drip. connection



Connection Throughout

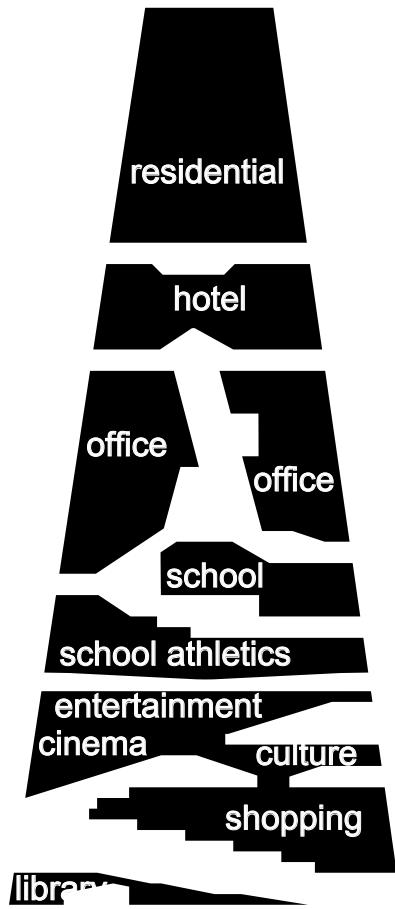


Spatial Breakdown



PUBLIC

Spatial Breakdown

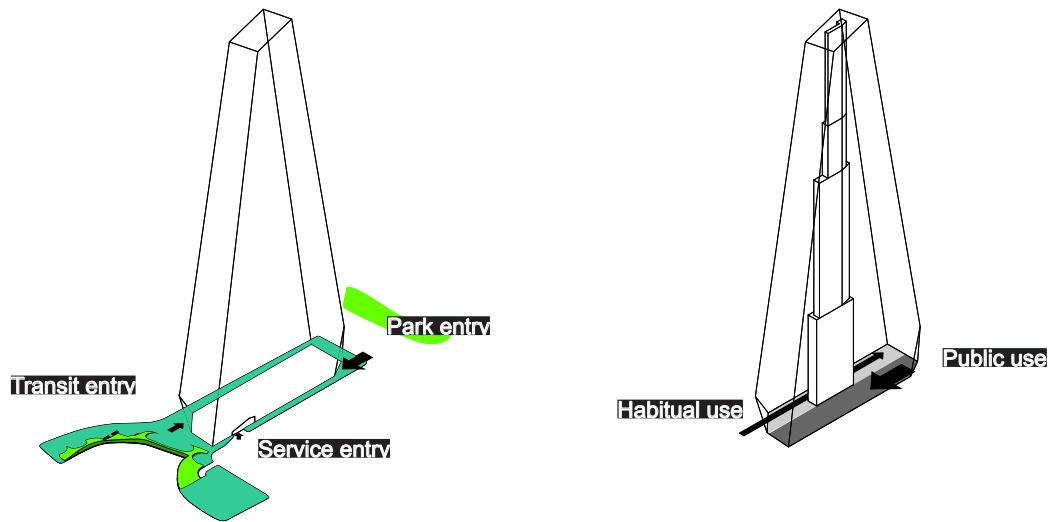


PRIVATE

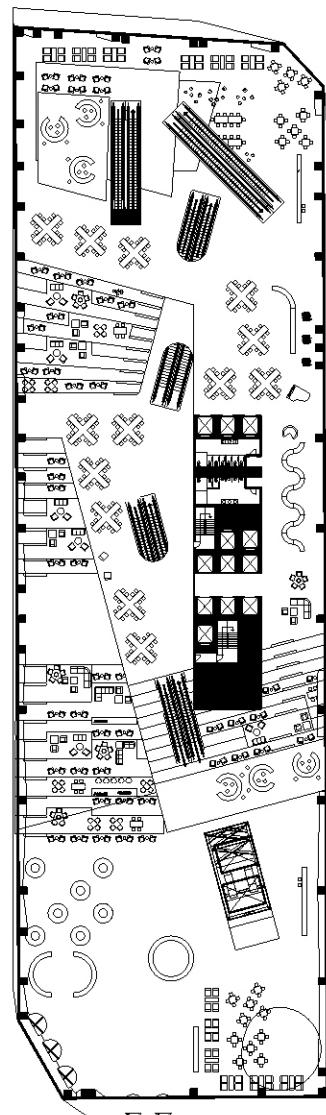




Entry Connection



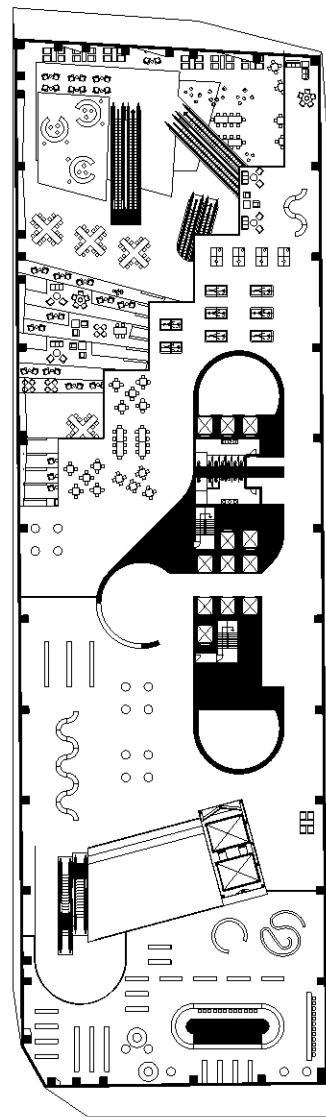
Ground Floor Public Library



Ground Floor Public Library



**Shopping Mall Overlooking
Library**

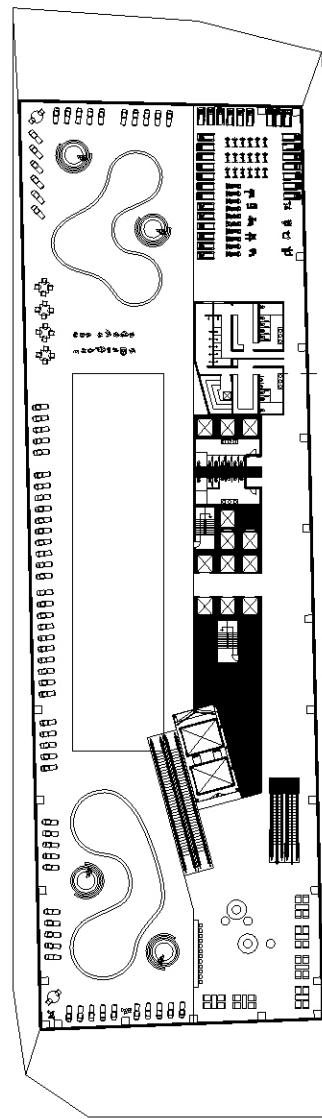


Shopping

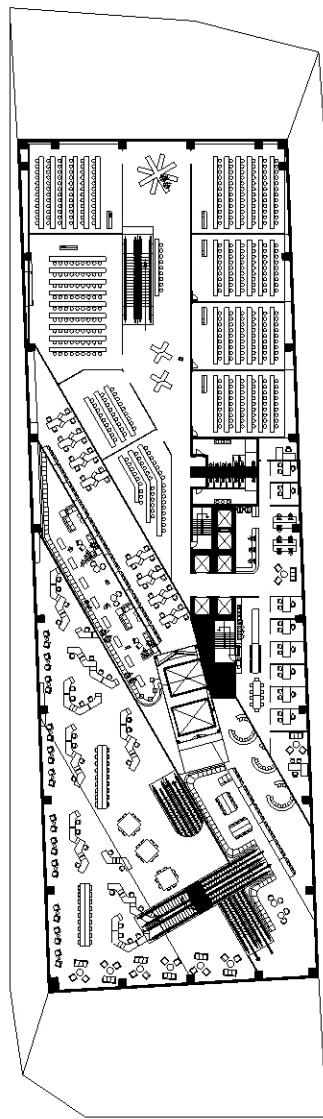




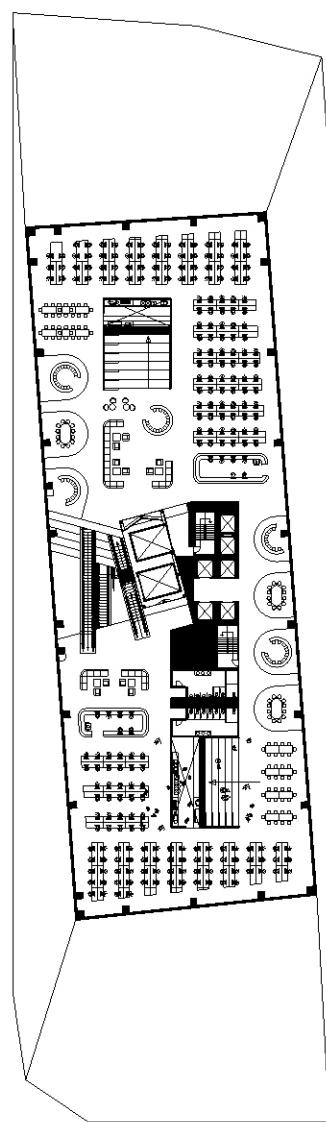
**Public Pool/ Recreation
Centre**



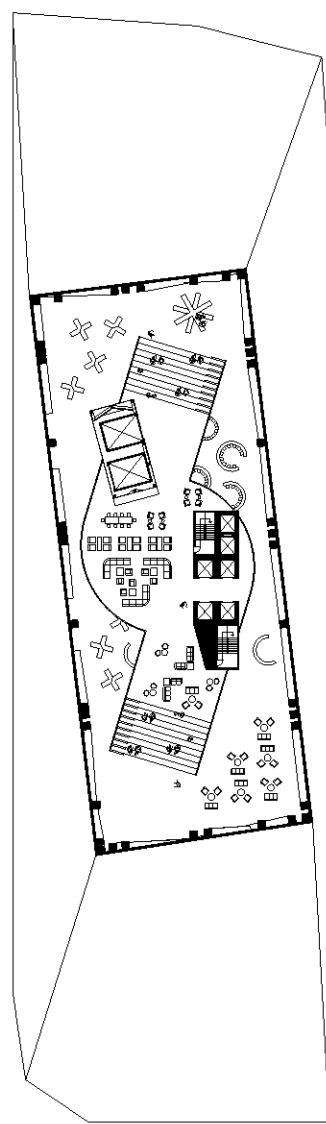
School/ College



Standard Office Floor



Sky Lobby



Rooftop Helipad

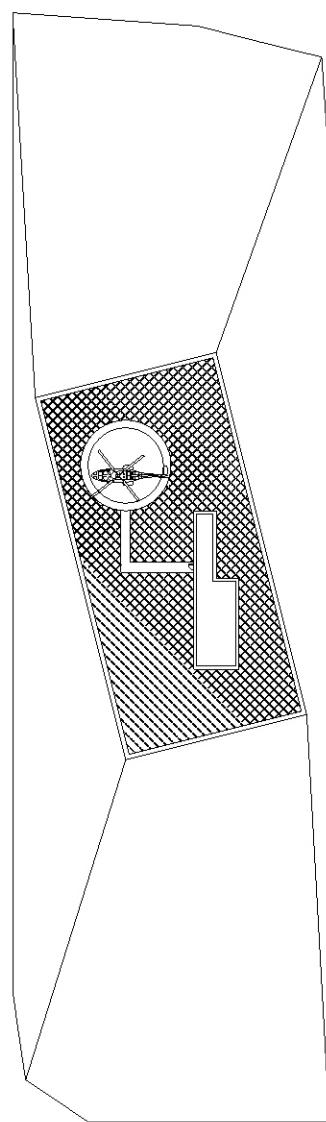






Image Credits

Image 1a,1b,2,3,4,8 Koolhaas, Rem. *Delirious New York, A Retroactive Manifesto for Manhattan*. The Monacelli Press, 1994. Print

Image5 "Fondation Le Corbusier - FONDATION." Fondation Le Corbusier - FONDATION. N.p., n.d. Web. 01 Apr. 2016.

Image6 "Fuller+building - Google Search." Fuller+building - Google Search. N.p., n.d. Web. 01 Apr. 2016.

Image7 "Equitable+building - Google Search." Equitable+building - Google Search. N.p., n.d. Web. 01 Apr. 2016.

Image 9,11 "The Evolution of Urban Planning in 10 Diagrams." CityLab. N.p., n.d. Web. 01 Apr. 2016.

Image10 "Mies Van Der Rohe – The Seagram Building." Ultra Swank RSS. N.p., n.d. Web. 01 Apr. 2016.

Image12 "Unite+d'habitation - Google Search." Unite+d'habitation - Google Search. N.p., n.d. Web. 01 Apr. 2016

Image13 "Le Corbusier's “contemporary City” (1925)." The CharnelHouse. N.p., 03 June 2014. Web. 01 Apr. 2016.

Image 14, 15 "In the Footsteps of Robert Moses - Re:form." Medium. N.p., 01 June 2014. Web. 01 Apr. 2016.

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Image 16 "Jane+Jacobs - Google Search." Jane+Jacobs - Google Search. N.p., n.d. Web. 01 Apr. 2016.

Image 17 "Battery+Park- Google Search." Battery+Park - Google Search. N.p., n.d. Web. 01 Apr. 2016.

Image 18 "Hong Kong & Shanghai Bank HQ | Foster + Partners." Hong Kong & Shanghai Bank HQ | Foster + Partners. N.p., n.d. Web. 01 Apr. 2016.

Image 19 "Commerzbank Headquarters | Foster + Partners." Commerzbank Headquarters | Foster + Partners. N.p., n.d. Web. 01 Apr. 2016.

Image 20 "Hearst Tower, New York City | Foster + Partners." Hearst Tower, New York City | Foster + Partners. N.p., n.d. Web. 01 Apr. 2016.

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End