



MEGASTRUCTURAL THINKING IN SUPERTALL DESIGN

WHY ARE MODERN SUPERTALLS NOT CONSIDERED MEGASTRUCTURES?

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TABLE OF CONTENTS

NARRATIVE_____ 5

THE AUTOMOBILE_____ 6

ADAPTIVE REUSE_____ 8

MEGASTRUCTURE_____ 12

MEGASTURCTURE - REYNER BANHAM_____ 18

EXODUS - REM KOOLHAAS_____ 34

DELIRIOUS NEW YORK - REM KOOLHAAS_____ 42

MILE HIGH TOWER - FRANK LLOYD WRIGHT_____ 74

THESUPERTALL_____ 88

ENDGAME OF HEIGHT_____ 96

A SUPERTALL ON FIFTH AVE_____ 100

THE BOARDWALK AT BRICKTOWN_____ 106

VIA 57 W - THE COURTSCRAPER_____ 112

BROOKLYN TOWER_____ 118

BRAINSTORMING A SITE_____ 130

BRAINSTORMING A PROGRAM_____ 138



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NARRATIVE

Initially, I find areas of interest in multiple categories that are all separate, yet have the ability to be connected. These ideas revolve around the concepts of adaptive reuse properties, how much space is allotted to the automobile in modern-day urbanity, and the concept of a megastructure. I say these can all be connected because of what conceptual megastructures of the 1960's proposed - they were monolithic structures that tackled the issues of traveling from one place to another, and created spaces where people could do everything in one place. This concept is similar to the goals of modern-day adaptive reuse campuses - the idea where an entire campus houses offices, apartments, gyms, restaurants, etc. everything that someone might need all in one place.

The concepts of urban location, density, and communal interaction are the umbrella that encompasses the ideas of adaptive reuse, transportation, and megastructural thinking, but I wish to explore why the megastructure movement of the late twentieth century failed in the way it did, and perhaps find a way that megastructural thinking can be incorporated into present-day architecture.





THE AUTOMOBILE

One of my initial points of interest is the automobile, particularly how valued the automobile has become in everyday life, and the question of their **efficiency**. Since the 1970's, the independent vehicle has taken over our streets, it is now the vehicle, no longer the person that is **prioritized** in our communities. The independent vehicle has become so dominant in fact, that the space left over for pedestrians dwindles more and more as time passes by. These images depict how much space pedestrians leave for vehicles, and send a message that it might be time to introduce the automobile into **architecture**, rather than moving around it.



How Much Space Vehicles Use - How Little is Left for Pedestrians
Source: Karl Jilg - 2014





Compariosn of Space Required for Individual Travel vs. Public Transportation
Source:Urban Thoughts





ADAPTIVE REUSE

Combining the issues related to the automobile and the ever-lasting effect of **industry**, the idea of an adaptive reuse campus comes to mind. Adaptive reuse buildings, particularly those within a campus offer the opportunity to reuse a previously abandoned building, primarily that with a manufacturing **heritage** as a revamped space for commercial, residential, or civic space. Adaptive reuse campuses allow for a **flexible** use typology as each building will simply be re-formatted on the interior, leaving most of the existing exterior as it was. This not only restores a sense of history in a particular community, but also allows these manufacturing buildings to be redefined as anything a developer may want. They focus on entirely housing, entirely office space, or a mix of all. In the case where the use typologies are mixed, this effect creates a **walkable** mixed-use campus that can act as a new hub for urban interaction for any city.





CASE STUDY - T3 AMERICAN TOBACCO - DURHAM, NC

American Tobacco is an example of an adaptive reuse project located in Durham, NC. located directly outside of downtown Durham lies the American Tobacco Plant - A campus of factory buildings that were once the **landmark** company and manufacturing capital of Durham. As of thanksgiving of 2022, the current site sits as 2 parallel blocks of buildings - the original tobacco factory - that have been adapted and reused as parking structures, bars, restaurants, pubs, cafes, and boutique stores with a mall style plaza in between. These building take advantage of the factory's original water wheel and water tower as a feature with flowing water in this space as well.



A Rendering of the Proposed Additions to the Campus' Original Structures
Source: T3 American Tobacco - 2022





Adjacent to the existing factory buildings is the oldest car dealership in Durham, previously owned by Cadillac. As the dealership has recently closed for business, the site was demolished in the beginning of 2023 in preparation for four new buildings, adding to the **mixed-use** urban fabric of the existing area. These new buildings will be home to more housing, office space, green plazas, and civic space including a movie theater, shopping center, and additional eateries. With the factory's adjacent location to the baseball stadium and the city's performing art's center, this campus has the potential to alter Durham's current **city center** to its location. a perfect example of how re-using existing buildings and populating the areas around them is able to create one, large, walkable community.



A Rendering of the Proposed Additions to the Campus' Original Structures
Source: T3 American Tobacco - 2022





CONCLUSION

Adaptive reuse campuses combine the issues related to vehicular-prioritized cities, the ever-lasting effect of industry, and incorporate megasturctural thinking into the scale of a low-level horizontal campus. The allow the opportunity for mixed-use campuses where the public have the chance to eat, sleep, work, and play, all in one, prioritize the pedestrian over the automobile, and all buildings that were once the heartbeat of America's economy the opportunity to start over - affecting an entirely new generation of workers, entrepreneurs, and visitors.





MEGASTRUCTURE

As my initial idea around the solution to some of my initial interests, I veer toward the idea of megastructures, but first, I need to truly understand what a megastructure is. A megastructure seems something of an **unfamiliar** idea to most, but has shown promise in recent years of what the future may hold - an entire community within one primary structure where a neighborhood lives, eats, sleeps, works, and plays. As I continue research on some of these ideas, I try to stay clear from defining exactly what a megastructure is - whether it is a tower, a mile long building, or an adaptive reuse campus - and wish to find out more about what a **solution** to these topics might look like. For now, I'm trying to focus on these interests one by one and looking at precedents and drawings in hopes of understanding exactly where I'd like to take my thoughts.

DEFINITION

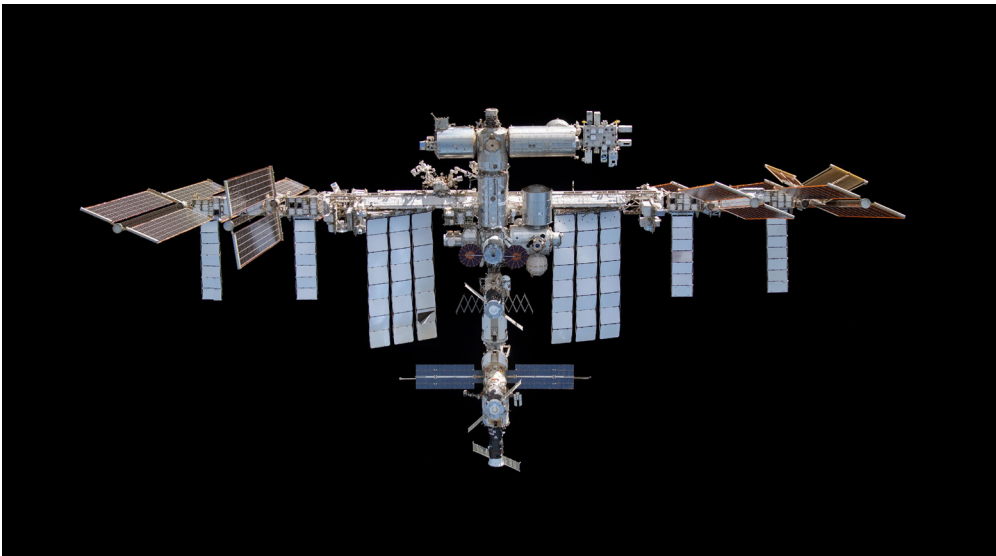
Merriam Webster defines a megastructure as '*a very large multi-story building or complex of buildings*' and although this is true to an extent, it feels as if it's not the full definition. It quickly becomes clear in a simple Google search that a megastructure doesn't have to be a building, and doesn't have to have more than one story. Although these are common traits of a megastructure, it seems that a more robust definition of a megastructure might focus on a structure that is the first of its kind, something with a **flexible** program, something unprecedented in today's world, and something that serves a **purpose** beyond something as simple as desire.





USES

As supertall towers emerge from the soils of New York and Dubai, they start to flirt with the classification from 'supertall' to 'megastructure' but towers aren't the only type of structure that have the opportunity to earn such a classification. Civil structures like the Hoover Dam, The Channel Tunnel, and the International Space Station are also all examples of megastructures. They all were highly innovative and technologically advanced for their time, served a purpose for a topic that was highly unknown of, and proved to the human race that we can accomplish building such structures that could be considered 'mega'.



Megastructure - International Space Station

Source: NASA





Kingdom Tower - Jeddah & Burj Khalifa - Dubai

Real-world examples of what could be considered a 'megastructure'

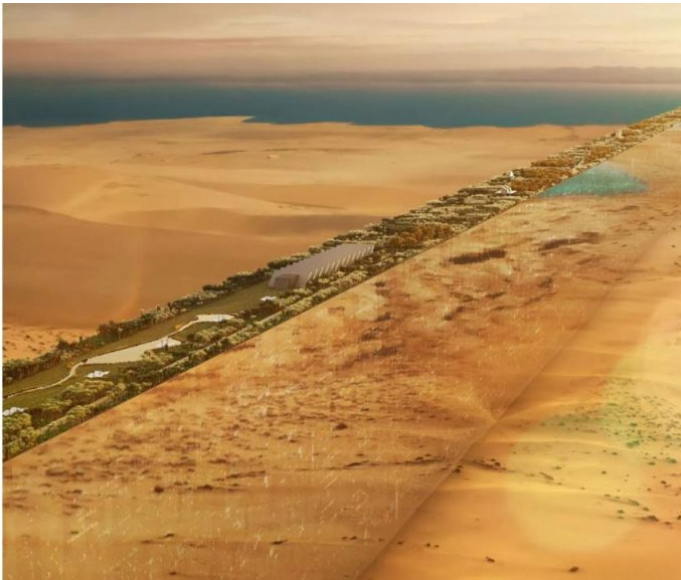
Source: Douglas Murphy - Guardian - 2015

VERTICALITY

As technology advances, more and more conceptual mega-projects are making their way through the industry, and some of them are even being built. The Kingdom Tower in Jeddah is a supertall tower exceeding 1,200 meters, and after a short Hiatus during the Covid Pandemic is once again on track to exceed the Burj Khalifa as the World's tallest building.





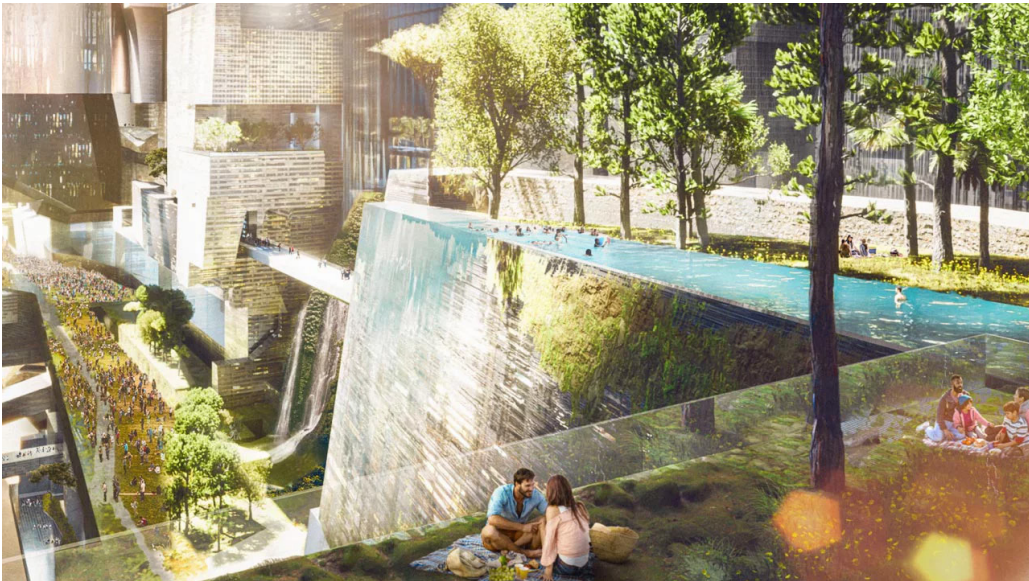


The Line - Saudi Arabia
Source: NEOM

HORIZONTALITY

The Line, on the other hand, is a project that has been more of an idea rather than a product as of now, but excavation has started in the Saudi Arabian desert, rumored to be for the start of construction of the Line - a nearly 1 1/2 mile long megastructure in the middle of the desert.





The Line - Saudi Arabia
Source: NEOM

HORIZONTALITY

The Line and Jeddah Tower are two of similar program - where one can live, work, and play in one spot. In this case, one is vertical, while the other is horizontal. As time continues, mega-structures will have more and more potential to become **hubs** of people, and have the ability to phase out what we now know as a suburb.





MEGASTRUCTURE - REYNER BANHAM





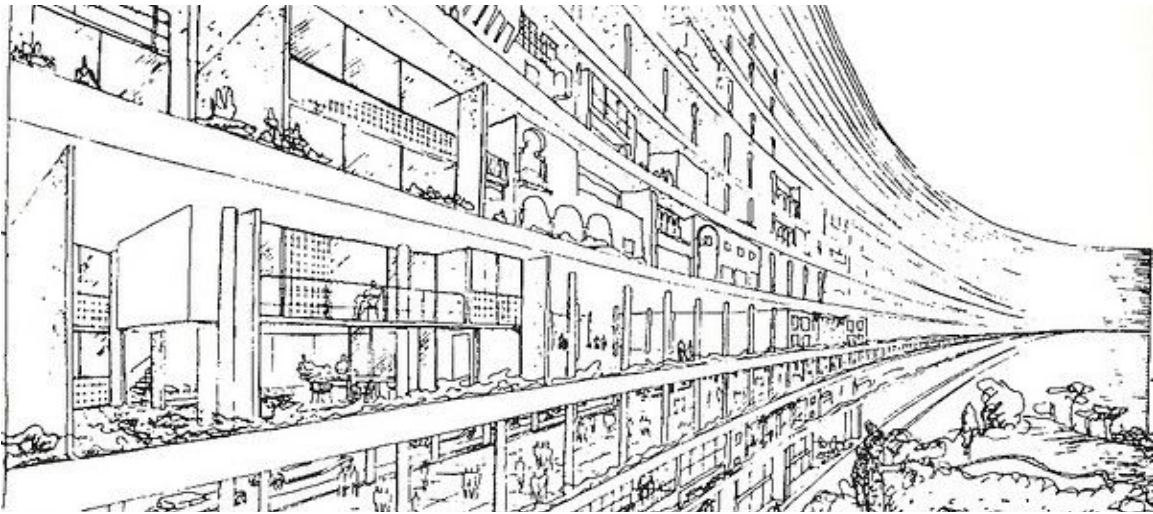
INTRODUCTION

Banham's book on megastructures recalls what used to be known as 'the great ongoing international megastructure conversation' of the 1960's. During this period of time, technology had finally advanced far enough that building structures of megacity was possible, but the question of their feasibility still remained.

The first passage of the book starts with, *"Megastructures in their time were all large buildings - but not all large buildings of the time were megastructures."*

This continues to be a topic of controversy today asking the question, 'what's the difference between a large building and a megastructure?' This question becomes even more imperative as technology advances with each decade and the technology involved with modern-day structures is far more advanced than that of 70 years ago.

Are megastructures of the past still megastructures? Or, have they lost their title as buildings of their size have become more common as the decades pass?



Project A - Fort l'Empereur, Algiers
Le Corbusier, 1931

- Recognized as a true ancestor of megastructures due to its seemingly unlimited length and the clear distinction between a permanent structure and the infill surrounding it.

The first example that Banham shows as a large work that marked this distinction of a large building but not a Megastructure is the Vertical Assembly Building at Cape Canaveral, Florida. Although it contained the largest single room ever built by man - large enough to contain its own weather - for the housing of fully assembled space rockets upright, the answer to 'is it a megastructure' was always no.

Banham claims that, "Megastructures, then, were large buildings of a particular kind" while still maintaining a difficulty in defining a particular definition. Although a particular definition may be tricky to put together, a popular megastructure ancestor of the time was seen in the work of Le Corbusier's For l'Empereur project from his Algiers plan of 1931. The project was, *"the massive sub-structure of an elevated super highway, built like a giant bookcase of reinforced concrete on the shelves of which the inhabitants have built two-story houses to suit their own tastes, not necessarily in le style Corbu."*

It is with this project that we see the birth of the theme **modularity**. What could also be considered flexibility, meaning a space within a structure that can be customized by user per their own particular liking and swapped in and out easily from one user to another. This becomes one of common themes of the buildings successful of bearing the name 'megastructure.'





DEFINITIONS

Fumihiko Maki defines a megastructure in 1964 as, *"a large frame in which all the functions of a city or part of a city are housed. It has been made possible by present day technology. In a sense it is a man-made feature of the **landscape**. It is like the great hill on which Italian towns were built..."*

Maki expands on the ideas of modularity and flexibility with the idea all parts of a city are housed in one place. In other words, megastructures are places where one has the opportunity to live, work, eat, sleep, and play all under one roof.

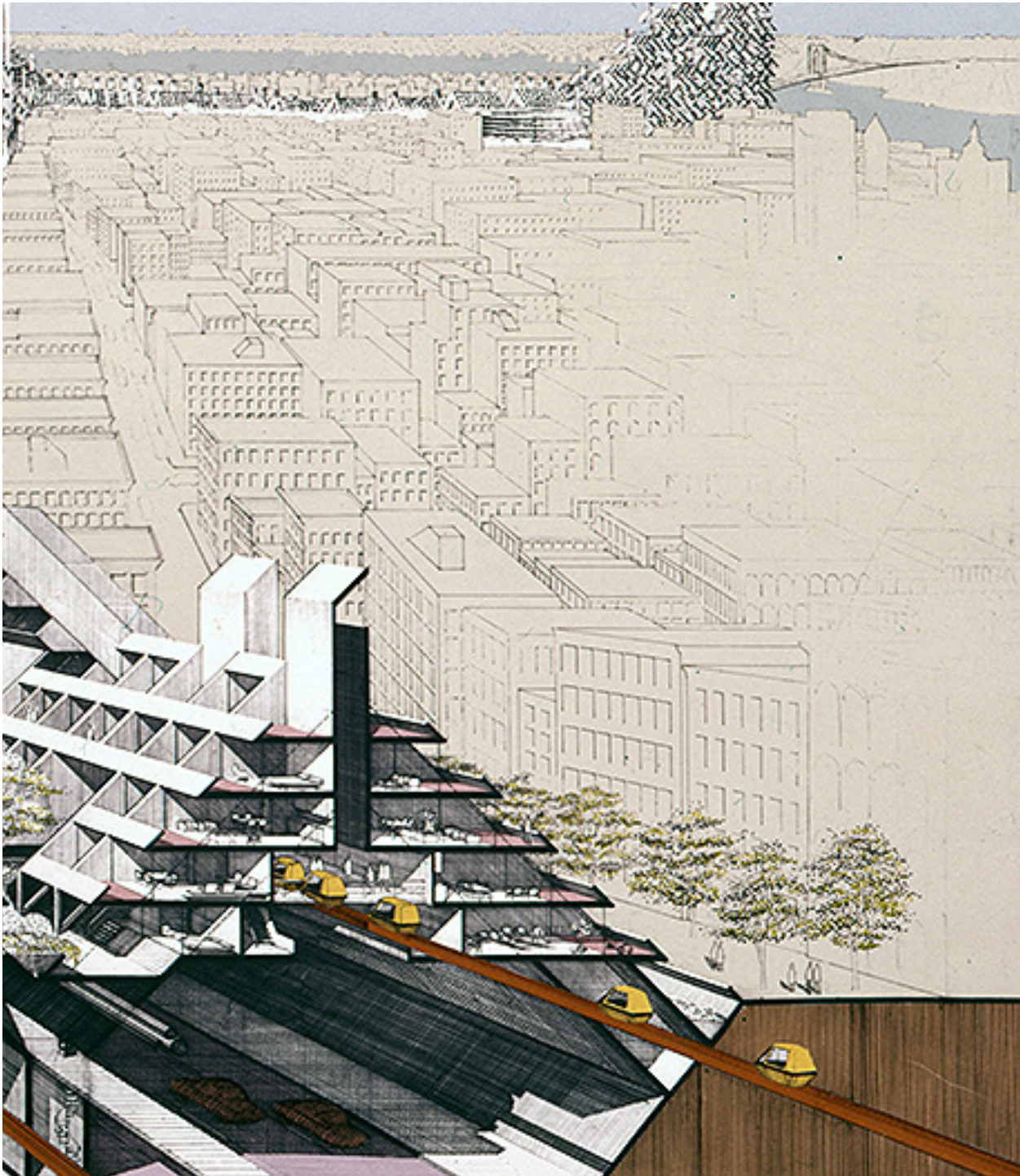
Kenzo Tange defines a megastructure as, *"a mass-human scale form which includes a Mega-form, and discrete, rapidly changing functional units which fit within the larger framework."*

It is in this statement where we see the consistencies of flexibility and modularity, but are introduced to the idea of **scale**. Tange's definition employs a sense of scale that is on the level of the human, with the human's scale fitting into something larger.

Like Maki, many megastructuralists saw their task as being the proposal of 'urban structures for the future' in which a modern, high-tech **society** could construct its own equivalent of spontaneous group form by natural accretion and reconstruction.









LOCATION

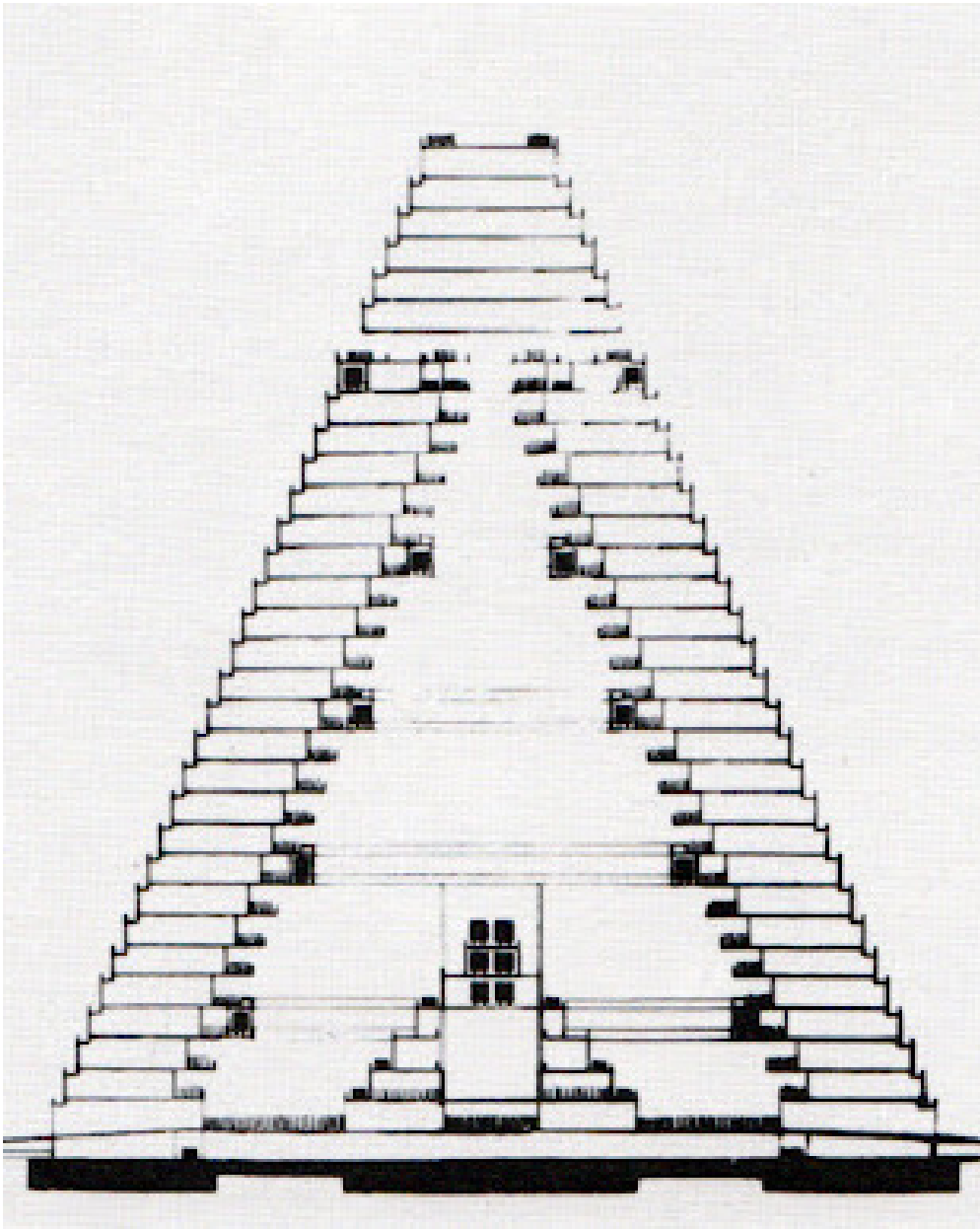
“One thing we can reliably deduce is that the designers, like most of the megastructure generation, had their eyes on North America as the part of the world that had problems vast enough to require ‘visionary’ solutions and the biggest technological resources for dealing with them, and that sheer dimensional bigness was an essential part of the solution to the continent-sized problems.”





LOCATION

This is a statement where one might say, ‘that didn’t age well.’ because although this statement was very true in the latter half of the 20th century, it is no longer the United States with the upper hand in technology. Yes, the United States is still one of the most powerful countries in the world, but the states no longer always posses the technological advantage as other growing countries have leveled the playing field. This is the exact reason that the Middle-East has seen more recent megastructures than the US has in recent years. The line, Burj Khalifa, Jeddah Tower, etc. all represent some of architecture’s most technologically advanced buildings and none of them are in the Western Hemisphere. Although the United States still sees its fair share of super-talls and large campus-sized projects, it’s a note to be taken that although one country may currently posses the upper hand in technology and more **social** need for a megastructure than another, it is all subject to change as the human race **evolves**.



Whonberg Project
Walter Gropius, 1928

- An A-frame structure similar to that of Rudolph's where apartments surround a transit system. This time the transit system stretches from one side of the building to the other rather than below and separate from the building entirely.





WOHNBERG

“There is a curious project, dating from 1928 for a Wohnberg - a giant A-frame of considerable length, with terraced housing throughout and several layers of transportation at scattered levels within... and described as a ‘megastructure’ in the captions and the catalogue. Furthermore, Mrs. Gropius specifically drew attention to the design as a megastructure in her speech opening the exhibition...”

This is yet another A-frame with a **transportation** network surrounded by housing, but this time, instead of the transportation being located subterranean and servicing an area outside of the building’s **ecosystem**, this method is placed laterally within the confines of the building and is meant to help residents travel from one side of the other with ease.

This is the second example that we’ve seen where the idea of transportation is one that becomes seamlessly integrated within the structure itself either allowing occupants to travel outside or within the megastructure with added ease.





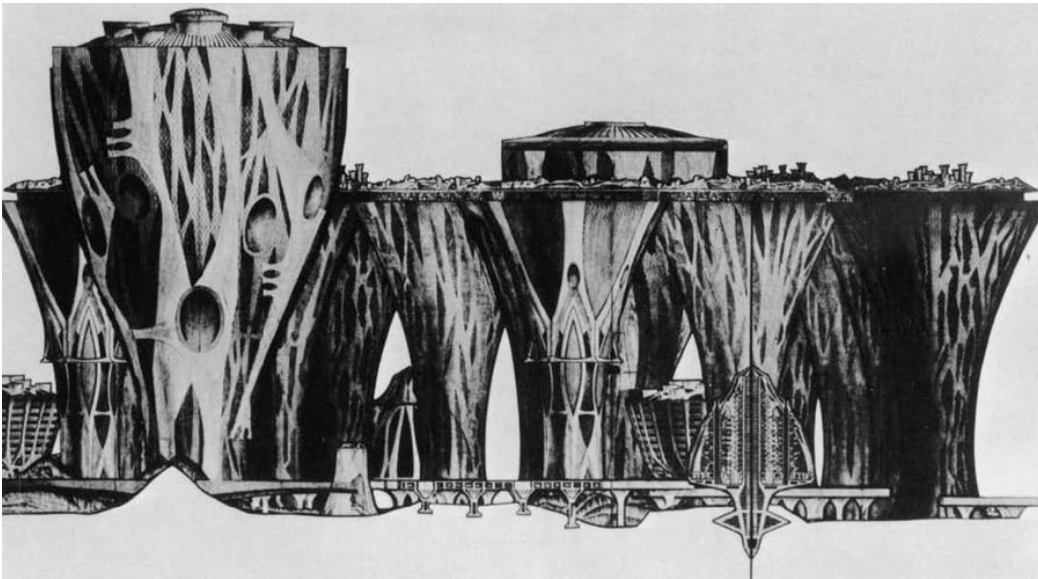
MEGA vs. OMNI

In 1968, the magazine *Progressive Architecture* in an article written by Chris Abel, cemented firmly in the idea that,

“(A megastructure is a) **large-scale** complex (of) buildings made necessary by the growing congestion of metropolitan areas... we call them omni-buildings rather than megastructures because it is not their mega (great, mighty) quality which is important, but rather their omni (all) aspect that is of interest. These buildings represent a beginning attempt at a syntheses of all man’s extensions...”

In this definition, we have moved away from the idea of ‘mega’ and toward the idea of ‘omni’. Although I think this is logical reasoning, I don’t think there is a need to veer away from ‘mega’ but rather **integrate** the two into one definition where a structure is of mighty quality and size while adhering to the ideas of all aspects of interest.





Mesa City Project
Paolo Soleri, 1959

- A desire to concentrate the human race at enormous densities in order to disencumber the earth's crust from suburban sprawl





Centre Pompidou
Renzo Piano & Richard Rogers - 1971

- Recognized as a megastructure due primarily to its modularity and size although not of immense scale

CENTRE POMPIDOU

“The project is not, in fact of overweening size; dimensionally it is average for megastructures that got built... Everything on these floors is movable, however, so that, mechanically at least, it comes close to the ludique character of Constant’s New-Babylon.”





Although Centre Pompidou is indeed a large structure in Paris, its size is not that of enormous scale, and there is nothing revolutionary outside of its exoskeleton that would make me think it classifies as a megastructure. Is the fact that the floor plates are entirely flexible enough to make a normal large building fall under the classification of a megastructure, or is there more to it?





AUTODESTRUCTIVE

“... megastructures were only likely to be taken seriously in culturally or economically sheltered environments where the words of architects would be heeded. By the end of the sixties the supply of such privileged environments was about exhausted, and Plateau Beaubourg may well prove to be the last.

But is also clear that, by then, the concept itself was about exhausted as well. **Why?** Why did that tide of opinion recede so quickly and leave the dozen or so built examples worthy of the name stranded like dinosaurs in a desert of distrust and misapprehensions?

Possibly because the concept was faulted right through by an inner contradiction that not be resolved. Some time around 1968 it seems to have been perceived that a city or a large part of a city designed by one man, or by any group unified enough to produce a comprehensible design, would be a parlously thin, starved and impoverished environment.

It was also perceived that the logical solution to the problem was to leave so much liberty for the self-housing and self-determining intentions of the inhabitants that they had liberty to also **destroy** the megastructure itself.

Peter hall was obliquely right; ‘autodestructive’ was a prophetic as well an important word, and since no architect who considers themselves worthy of their craft can bear to stand by and see his designs destroyed, especially grand designs on the scale of the city, megastructure proved to be a *‘self-canceling concept.’*





TAKEAWAYS FROM BANHAM

Banham's book is able to clear up many of the unknowns revolving around megastructures. Rather than saying a megastructure is just a large building, we now understand that there's a lot more to the classification of a megastructure than just its size. It starts to become clear that this classification requires a focus on modularity and flexibility - whether it be within the floor plate or use groups, a focus on scale, a focus on the ideas of a society, interaction, and an ecosystem, and a focus on transportation either within or surrounding the structure itself.

We also start to understand why this movement in the second half of the twentieth century ultimately failed, and why it is so much more uncommon to see these structures today. It is because they were designed to fail - not structurally, but programmatically. They canceled themselves out in the end, and because of this, the term lost its footings. Perhaps this is one of the reasons that structures of enormous size and technology are not seen as megastructures today.



EXODUS - REM KOOLHAAS

EXODUS, THE VOLUNTARY PRISONERS OF ARCHITECTURE

- The thesis project of Rem Koolhaas in collaboration with Madelon Vreusendorp, Elia Zenghelis, and Zoe Zenghelis investigates how the Berlin Wall of West Berlin during the time of the Cold War becomes a condition of freedom by self imprisonment. As the citizens of West Berlin segregate voluntarily, they are indirectly finding shelter within wall of a prison at a metropolitan scale. The images shown throughout are a selection from the MOMA exhibit of 2011 and highlight some of the more moving images that suggest people are trying to live normal lives within the confines of a metropolitan prison, acting as if nothing is wrong.





Exodus - The Voluntary Prisoners of Architecture

Source: Rem Koolhaas et al - 1972





Exodus - The Voluntary Prisoners of Architecture
Source: Rem Koolhaas et al - 1972





EXODUS

Koolhaas and his colleagues compare this to the idea of a megastructure. They suggest that constructing an edifice where one can live, eat, work, play, and sleep would be the same as constructing walls around a city where its residents wouldn't have the freedom to go where they choose.

Although the idea of a megastructure doesn't have to take on the idea of confining its residents to a localized area, Koolhaas is simply suggesting that the influx of megastructures has the possibility to inhibit negative habits among its residents, as they start to adjust to the life of everything in one place. Koolhaas worries that once residents get used to this idea, their way of life might be changed for the foreseeable future, enticing outsiders to exhibit the same bad habits.





Exodus - The Voluntary Prisoners of Architecture
Source: Rem Koolhaas et al - 1972





MEGASTRUCTURE CONCLUSION

Throughout the analysis of Koolhaas' and Banham's depictions of megastructures, it has become more clear on what a better understanding of a megastructure might look like. Although still up for interpretation, to me, a megastructure is a building that learns from four primary lessons.

1 - A building that is designed both internally and externally to host a **variety** of users in a easily adaptable manner (Flexibility)

2 - While maintaining a flexible design, a building that is of larger than average size. Rather than saying a building must be so tall or long, this focuses on the idea of **scale**. The scale of the building to the human scale and the city scale. A building that must allow for the seamless interaction of the human scale within.

3 - A design that can withstand the ever-evolving human race and its needs. I believe the idea of the megastructure proved to be a self-canceling concept as many megastructures of the time were designed for one purpose only, not adhering to the **societal needs** that come with human evolution.

4 - A building that hosts its own form of **transportation**. Whether this form is meant to help occupants travel from one point of the building to the other, or to an exterior neighborhood outside the realm of the building itself, circulation and access to different areas beyond the typical stair and elevator are a common theme in precedent megastructures.

- In turn, a megastructure is a building of grand size designed to adapt to different users over a prolonged period of time. Under this definition, there are many buildings throughout the 21st century world that fall under this category. So this prompts the question - **why** is the term 'megastructure' used so lightly in today's world?





REALIZATION

After studying the thesis of Rem Koolhaas, I've found a distaste around the idea of a typical megastructure. I've realized that although living, working, sleeping, and playing all in the same place may be a nice idea for some, many of the studies on mega-structures seem to be thought in the mindset of making that the *only* way people live. To me, that makes it feel like we are all trapped in a cage, similar to Koolhaas' reference of the Berlin Wall. I don't think people should be confined to a particular area, and I find it a tragedy that some people don't have the ability to travel out of their hometown, state, or even country.





REALIZATION

However, after diving deeper into the definition of a mega-structure with Banham, I think there is a way to still accomplish this idea while adhering to the lessons learned in Banham's book, and I still think that a structure that houses everything that one may need could act as a standard for the future. Rather than making this the *only* way to live, I wish to make this a luxury for the public - an option outside of the current norm - that allows people to live this way if they choose, but also acts as a **utopian landmark** for a new typology that the future may hold. This typology being a structure or site that houses everything from apartments and condos to offices and bowling alleys - a place where someone can live, work, and play in one area, but also one that acts as a place of **commerce** and **capital** for its location's city, and a place of **attraction** for visitors.

With this in mind, I look toward the skyscraper - how a building can house a variety of typologies within one site on a single plot of land, and how the ideas of the twentieth century mega-structures can be incorporated into modern-day buildings. To investigate this further, I need to look at skyscrapers of the past and present, particularly the modern-day **supertalls** and how they house such large amounts of space within one plot of land.



DELIRIOUS NEW YORK - REM KOOLHAAS



Apres L'amour

Source: Madelon Vriesendorp - 1975

AFTER LOVE

The origins of the Manhattan Skyline, the Chrysler Building in bed Apres L'amour (after love).





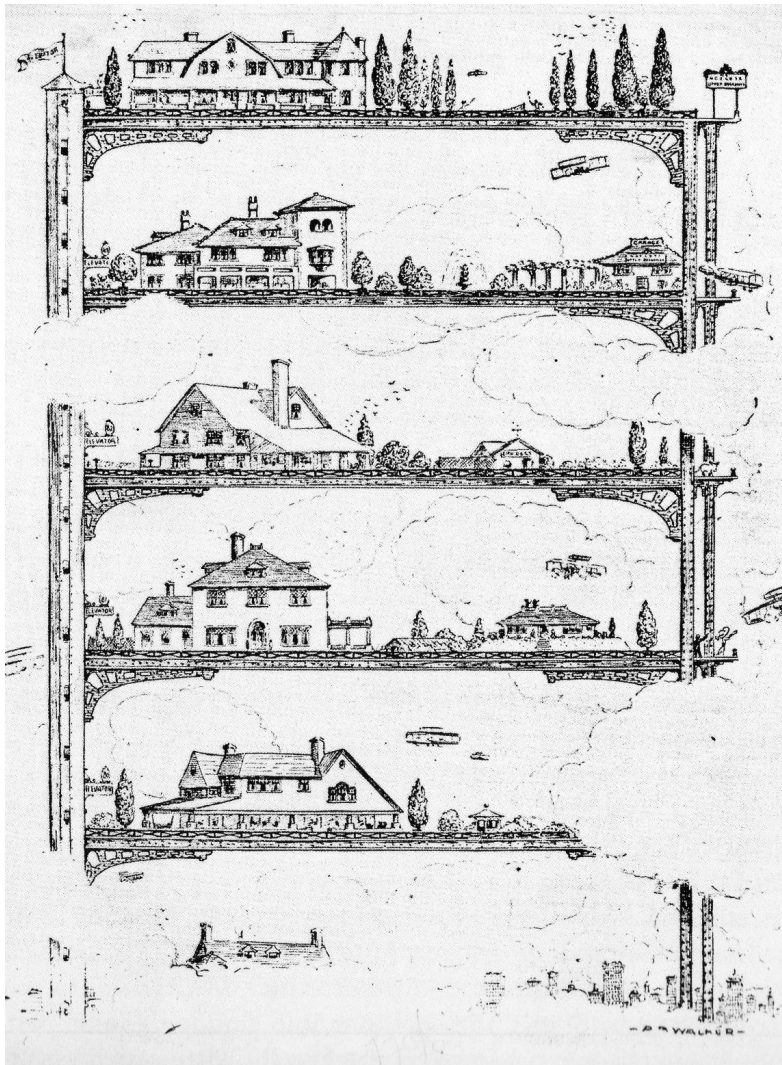
Flagrant Delit

Source: Madelon Vriesendorp - 1975

CAUGHT IN THE ACT

The origins of the Manhattan Skyline, the Chrysler Building in bed caught in red handed by the newcomer of the skyline - the Rockefeller Center.





1909 Theorem

- The skyscraper as a utopian device for the production of unlimited numbers of virgin sites on a single metropolotain location.
- Each level is treated as a virgin site, as if the others didn't even exist to establish a stricly private residence.
- "Villas may go up and collapse, other facilities may replace them, but that will not affect the framework"
- "The Manhattan Skyscraper as a utopian formula for the unlimited creation of virgin sites on a single urban location"





“The situation of Manhattan’s financial district with rivers on either side forbidding lateral expansion has encouraged architectural and engineering skill to find room **aloft** for the vast interests that demand office space in the heart of the New World.”

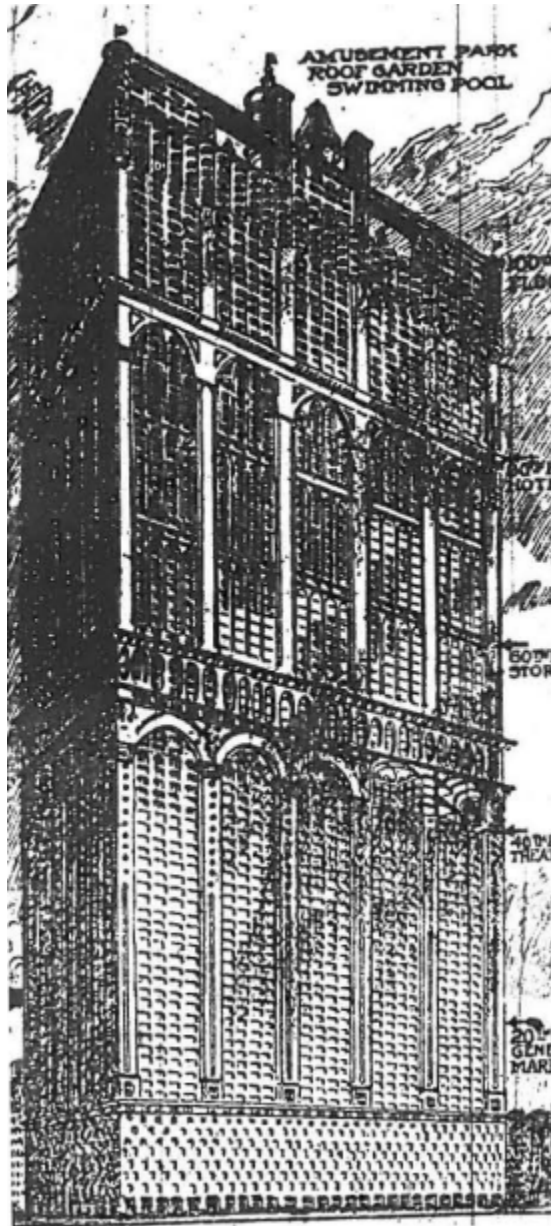
In other words: Manhattan has no choice but to build up through the application of a **vertical extrusion** of the grid itself. In the case of Manhattan, the skyscraper offers the wide-open spaces of a man-made ‘Wild West, a **frontier** in the sky’ The skyscraper of Manhattan applies the principles of the 1909 Theorem by supporting ‘virgin’ plots of floor rather than land to establish alternative realities, lifestyles and ideologies on one single urban location.



“Step by step we have advanced from the wooden hut to the thirty story skyscraper... Now we must develop something different, something larger... As the conceptual stratosphere of the 100th floor is approached, the programmatic settlement of the platforms according to the 1909 theorem imposes itself: filling the interior with business alone is **inconceivable**.

Koolhaas is stating that at the time of the 1970's and 1980's as skyscrapers are able to start building to heights of 100 floors and higher, it has become apparent that they are **inefficient** if they are only serving one purpose whether it be strictly apartments or offices, that if towers are able to build to such extreme heights that they should take advantage of different typologies and program as the 1909 theorem suggests. This still holds true today and was one of the breakthrough theories of Koolhaas' studies.





Theodore Starrett's 1906 Proposal for 100-Story Building

- "In New York we must keep building and we must build upward"
- "Our civilization is progressing wonderfully..."





The Manhattan Skyscraper is born in installments between 1900 and 1910. It represents the fortuitious meeting of three distinct urbanistic breakthroughs that, after relatively independent lives, converge to form a single mechanism. These three factors are:

- 1 - The Reproduction of the World
- 2 - The Annexation of the Tower
- 3 - The Block Alone

Although each factor has its own strengths and weaknesses, each weakness becomes a strength when the three factors are **fused** together into one building. “The tower lends meaning to the multiplication, the multiplication pays for the metaphors on the ground floor, and the conquest of the block assures the tower issolation as sole occupant of its island. The true skyscraper is the product of this triple fusion”

The first built amalgamtion of these three breakthroughs is the Woolworth Building, completed in 1913.





Woolworth Building - New York
Cass Gilbert - 1913

- "The Cathedral of Commerce" 60 floors





“Its lower 27 floors are a straightforward **extrusion** supporting a 30-story tower; the graft occupies an entire block”

“But this ‘Glorious Whole’ quite beyond the control of human imagination is only a partial realization for the potential of a skyscraper. It is a masterpiece merely of materialism: none of the programmatic promises of the new type are exploited.”

“The Woolworth is filled, from top to bottom, by business. The tower is subdivided into office suites with discrete decorative themes... while the lower floors accommodate modern administrative operations.”





AUTOMONUMENT

“Beyond a certain critical mass each structure becomes a **monument**, or at least raises that expectation through its size alone, even if the sum or the nature of the individual activities it accommodates does not deserve a monumental expression”

“This category of monument presents a radical, morally traumatic break with the conventions of symbolism: its physical manifestation does not represent an abstract ideal, an institution of exceptional importance, a three-dimensional, readable articulation of a social hierarchy, a memorial: it merely is itself and through sheer volume cannot avoid being a **symbol**”

It is in these statements that show exactly why owners and developers have a great desire to build to such great heights, not only today, but since the birth of the skyscraper. The feeling of **monumentality** and opportunity of **advertisement** makes the price tag of building such a large tower well worth it.





1916 ZONING LAW

The 1916 Zoning Law describes on each plot of land or block of Manhattan's surface an imaginary envelope that defines the outlines of the maximum allowable construction.

"The law takes the Woolworth as the norm: the process of sheer multiplication is allowed to proceed up to a certain height; then the building must step back from the plot line at a certain angle to admit light to the streets. A tower may then carry 25% of the plot area to unlimited heights"

"The 1916 Zoning Law defines Manhattan for all time as a collection of 2,028 colossal 'phantom houses' that together form a **Mega-Village**. Even as each 'house' fills up with accommodation, program, facilities, infrastructures, machineries, and technologies of unprecedented originality and complexity, the primordial format of 'village' is never endangered.

As the progression of skyscrapers start to have a greater presence on the skyline of Manhattan, they also start to create dark and gloomy scenes at the **scale** of the street and pedestrian. As these towers create immense gloom of shadow below, the 1916 Zoning Law introduces mandatory setbacks in a tower's footprint as it grows taller to limit the amount of shade produced on the sidewalks below.





Metropolis of Tomorrow
Hugh Ferriss - 1916

Illustrations depicting the possible outcomes of future skyscrapers - according to the 1916 Zoning Law regulations and requirements





“The New York Law, formulated by a group of technical experts, was based on purely practical considerations... By limiting the bulk of a building, the number of occupants was limited; fewer people required access and egress; traffic on adjoining streets was lightened. The limitation in mass had also of course the effect of permitting more light and air into the streets as well as into the buildings themselves... The Zoning Law was not at all inspired by concern for its possible effect on architecture... After 1916, no structure in Manhattan could exceed the limitations of this spectral shape. To exploit maximum financial return on any given block, Manhattan’s architects were forced to approximate it as closely as possible.

The illustrations of ‘what became possible’ with the massing of the updated zoning law quickly showed that the masses were **unethical** and simply unnecessary . Architects quickly realized that maximizing floor area and building size was not worth the affect these buildings would have on everyday life; they mutually agreed to design with the updated zoning laws and **human life** both in mind.





A Modernized Venice

Harvey Wiley Corbett - 1975

Illustrations depicting a possible utopia of future Manhattan; one where the entire city is made of skyscrapers that are all connected with multi-level paths for pedestrians, automobiles, trains, and public transportation alike.





Fifth Ave & 33rd Street - New York, NY
Renatto Grussu - 2021

The Waldorf vs. The Waldorf Astoria - Before and after expansion and renovation into the Waldorf-Astoria Hotel





The Lives of a Block: The Waldorf-Astoria Hotel & The Empire State Building

One of the 2,028 block defined by the 1811 Commissioners' Plan lies west of Fifth Avenue between 33rd and 34th streets.

"The transformations of this one block in a period of less than 150 years from virgin nature to the **launching pad** of two of Manhattan's - and America's for that matter - definitive skyscrapers; The Empire State Building and the Waldorf-Astoria Hotel. Representing a summary of the phases of Manhattan's urbanism, featuring all the strategies, theorems, paradigms, and ambitions that sustain the inexorable progress of Manhattanism. The layers of its past occupancies still exist on the block as an invisible archaeology, no less real for being disembodied."

The impact that the site of this one simple block in Manhattan is exactly what developers and designers of modern buildings should strive for - to leave some type of **historic footprint** on a site that carries from one building to another throughout a site's timeline.

"Many an arriving immigrant looked on the Astor Mansions as a promise of what America might yield to him, too, through work and energy and through determination.."

Yet another case - earlier than most - of a building acting as a monument, **landmark**, and billboard.





“In 1896, three years after the opening of the Waldorf, the 16-story Astoria is completed. On the ground floor its dominant feature is Peacock Alley, an interior arcade that runs parallel to 34th Street for more than 300 feet, from an interior carriage driveway to the Rose Room on Fifth Avenue. On the ground floor the two hotels are joined by shared facilities that puncture the dividing wall: the two-story Palm Room, a branch of Peacock Alley kitchens. On the second and third floors are the Ballroom and the Astor Gallery.”

“As it becomes, in a few years, ‘the accepted scene of a great variety of concerts, dances, suppers, and theatrical entertainments’ the Waldorf-Astoria can claim to be Manhattan’s social center of gravity, ‘a semi-public institution designed for furnishing the prosperous residents of the New York metropolitan district with all of the luxuries of urban life.’ In the twenties the Waldorf-Astoria has become ‘the Unofficial Palace of New York.’

By the 1920’s the most up-to-date version of the Waldorf- Astoria Hotel becomes what every modern mixed-use building strives to be - whether it be a tower or a small communitycenter. The primary function of mixed use structures - beyond that of densifying a particular site - is that of creating a **community** where anyone can do almost anything, and the Waldorf-Astoria was able to accomplish that goal even 100 years ago.





New Waldorf-Astoria as Reincarnation of the Old
Lloyd Morgan - 1939

An imagination of what the hotel might look like after its next expansion, before the erection of the Empire State Building

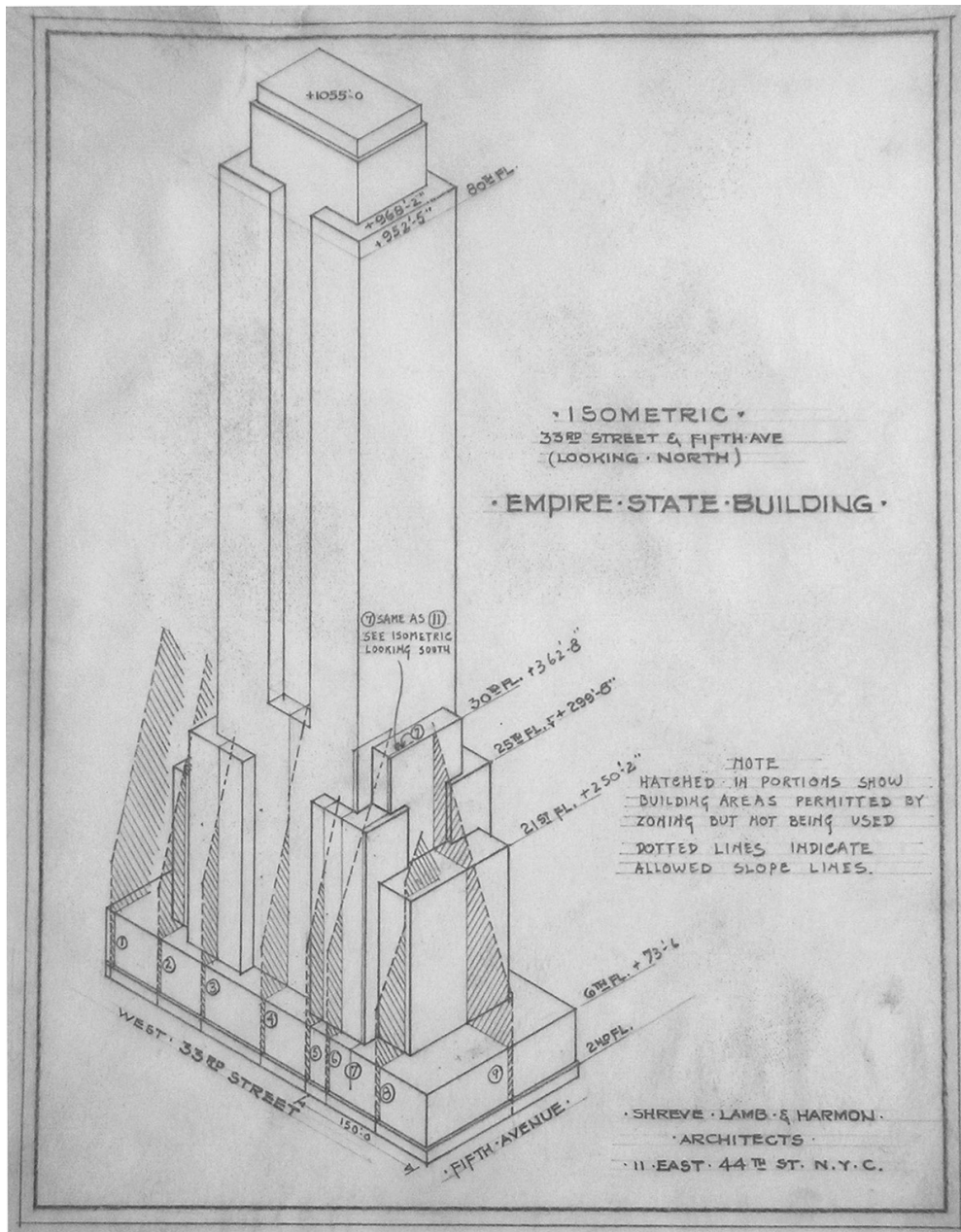




“...A sequence of occupancies - from virgin nature to Thompson’s farm, to the Astor Mansions, the Waldorf Astoria Hotel, to finally, the Empire State. It suggests that the model for Manhattan’s urbanism is now a form of architectural cannibalism: by swallowing its predecessors, the final building accumulates all the strengths and spirits of the previous occupants of that site and, in its own way, **preserves** their memory.”

It is in the passage above that outlines once again what this particular block of Manhattan was able to accomplish over 200 years of history. With each new building on the site between the original farm to the Empire State building, each new creation was able to pay **homage** to its predecessor in one way or another, preserving the historic **heritage** and fabric of the site. I believe this is something every new design should strive for, especially in such a dense community of Manhattan where there is so much urban history in conversation.





Isometric of Empire State's Setbacks Adhering to 1916 Zoning Law
Shreeve, Lamb, & Harmon - 1929





Downtown Athletic Club
Starrett & van Vleck - Manhattan - 1931





Definitive Instability: The Downtown Athletic Club

“This serenity hides the apotheosis of the Skyscraper as instrument of the Culture of Congestion.”

The Building’s exterior simplicity contrasts and hides the chaotic array of events happening on the inside.

“The Club represents the complete conquest - floor by floor - of the Skyscraper by social activity.”

Each floor serving a different yet related purpose encapsulates the idea of a perfect mixed-use skyscraper; one that uses a repeated floor plate to fit as much different **activity** as possible in one building.

“In the Downtown Athletic Club the Skyscraper is used as a Constructivist Social Condenser: a machine to generate and intensify desirable forms of human intercourse.”

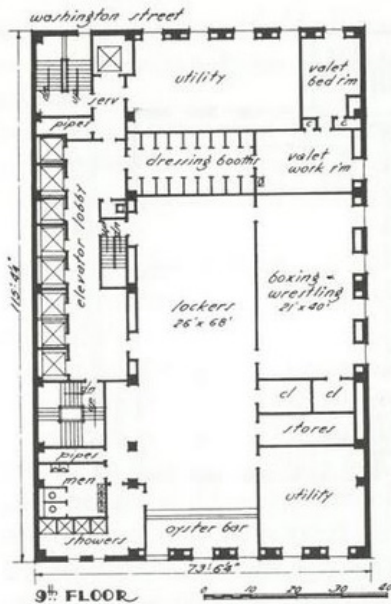
The arrangement of the Downtown Athletic Club is meant to **engage** human interaction above all else as it uses health and fitness as a way to kickstart engagement between one another.



“In only 22 years the speculations of the 1909 theorem have become reality in the Downtown Athletic Club: it is a series of 38 **superimposed** platforms that each repeat, more or less, the original area of the site, connected by a battery of 13 elevators that forms the north wall of the structure.”

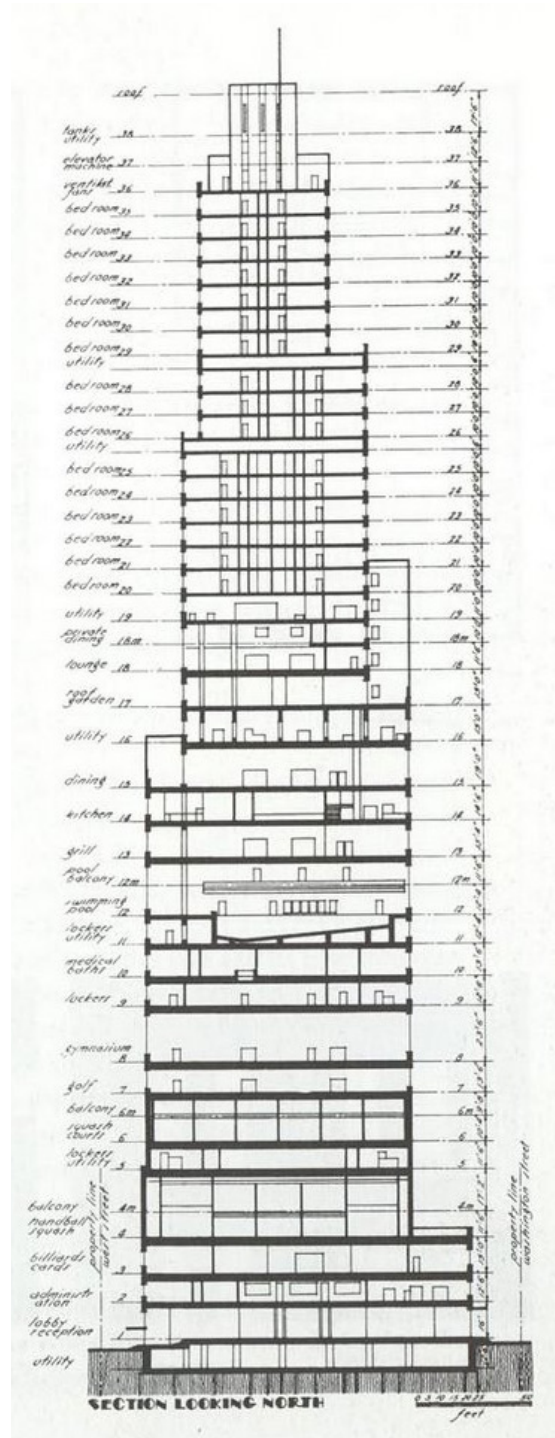
In a matter of just over two decades, the principles outlined in the 1909 theorem of plots of land being stacked on top of one another where each plinth served a separate function had been applied accurately into the program of skyscraper with the DAC. Rather than plots of land, the 38 levels of what is more or less the shape of the site **extruded** into the air all serve their different purposes. In this case, the core of elevators becomes the framework of holding and accessing these different plots from one level to another; allowing all levels to be separate, yet accessible by **choice**.





Plan of Ninth Floor

Just in case you wanted to hit the oyster bar after your boxing match - before or after you get changed in the locker room.





PROGRAM

1-6

“The lowest floors are equipped for relatively conventional athletic pursuits: squash and handball courts, poolrooms (billiards) etc... all sandwiched between locker rooms.”

7

“Of all the floors, the interior golf course - on the seventh - is the most extreme undertaking: the transplantation of an ‘English’ landscape of hills and valleys, a narrow river that curls across the rectangle, (footprint) green grass, trees, a bridge, all real, but taxidermized in the literal realization of the ‘**meadows aloft**’ announced by the 1909 theorem. The interior golf course is at the same time obliteration and preservation: having been extirpated by the Metropolis, nature is now resurrected inside the Skyscraper as merely on of its infinite layers... The Skyscraper has transformed Nature into **Super-Nature**”

9

“Emerging from the elevator on the ninth floor, the visitor finds himself in a dark vestibule that leads directly into a locker room that occupies the center of the platform (floorplan) where there is no daylight. There, he undresses, puts on boxing gloves and enters an adjoining space equipped with a multitude of punching bags. On the southern side, the same locker room is also serviced by an oyster bar with a view over the Hudson River.”





PROGRAM

10

"In a further escalation, the tenth floor is devoted to preventive medicine. On one side of a lavish dressing lounge an array of body-manipulation facilities is arranged around a Turkish bath: sections for massage and rubbing, an eight-bed station for artificial sunbathing, a ten-bed resting area. On the south face, six barbers are concerned with the mysteries of masculine beauty and how to bring it out."

12

"On the 12th floor a swimming pool occupies the full rectangle; the elevators lead almost directly into the water. At night, the pool is illuminated only by its underwater lighting system, so that the entire slab of water, with its frenetic swimmers, appears to float in space, suspended between the electric scintillation of the Wall Street towers the stars reflected into the Hudson."

13-17

"The next five floors are devoted to eating, resting, and socializing: this contain dining rooms - with a variety of privacies - kitchens, lounges, even a library. After their stringent workouts on the lower floors, the athletes are finally in condition to confront the opposite sex on a small rectangular dance floor on the 17th story roof garden."





PROGRAM

20-35

“From the 20th to the 35th floors, the Club contains only bedrooms. ‘The plan is of primary importance, because on the floor are performed all the activities of the human occupants’ that is how Raymond Hood has defined Manhattan’s version of functionalism distorted by the demands and opportunities of density and congestion.”

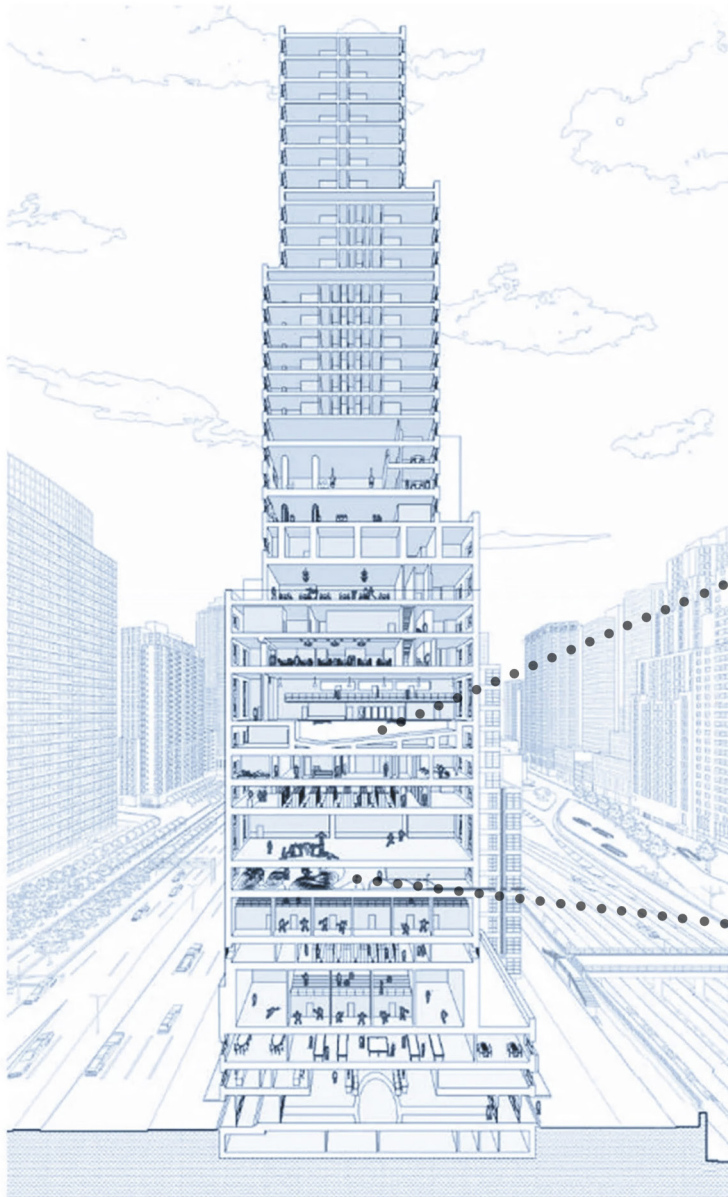
“Such an architecture is an aleatory form of ‘planning’ like itself: in the fantastic juxtaposition of its activities, each of the Club’s floors is a separate installment of an infinitely unpredictable intrigue that extols the complete surrender to the definitive instability of life in the Metropolis.”

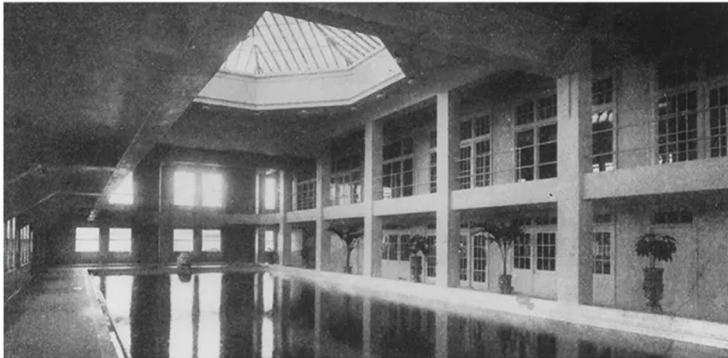
- In the Downtown Athletic club, each plan at different levels offer an **abstract arrangement** of activities that allude a different type of performance or activity that is only a **fragment** of the bigger picture.





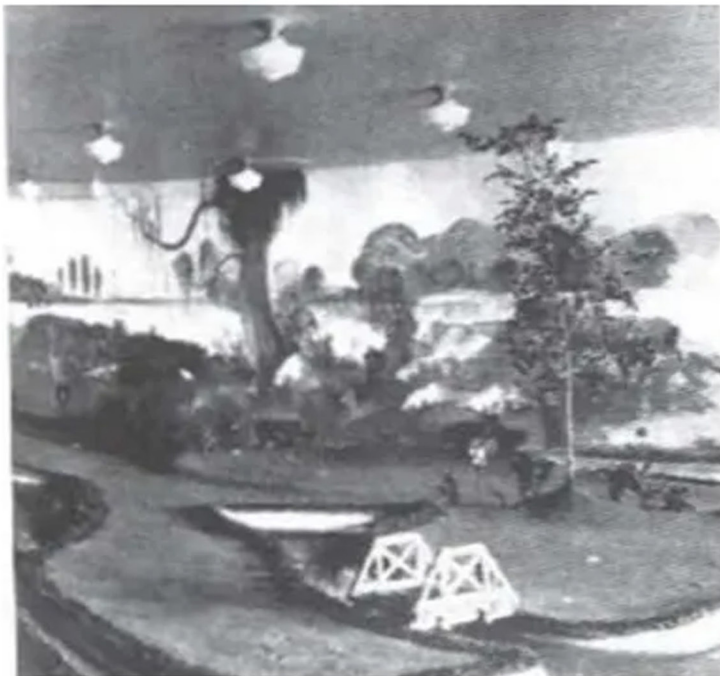
69





DAC Twelfth Floor - Swimming Pool

"At night, the pool is illuminated only by its underwater lighting system, so that the entire slab of water, with its frenetic swimmers, appears to float in space."



DAC Seventh Floor - Interior Golf Course

"...the transplantation of an 'English' landscape of hills and valleys, a narrow river that curls across the rectangle, green grass, trees, a bridge, all real, but taxidermized in the literal realization of the meadows aloft..."





TAKEAWAYS FROM DLR

In Delirious New York, we're able to gather a better understanding of skyscrapers as we were megastructures with Banham, and are able to gather lessons and accepted minimums when it comes to designed and building skyscrapers:

- 1 - The importance of the vertical extrusion of the city grid, plinths aloft, frontiers in the sky; all about the idea of going up instead of out.
- 2 - The inconceivability and inefficiency of filling buildings with one use group only.
- 3 - The opportunity for monumentality, symbolism, and advertising through these buildings. The height of skyscrapers allows for these things to happen automatically
- 4 - The importance of historic footprint, preservation, and heritage when building a skyscraper; not only focusing on respecting what was left behind, but adding onto the heritage with a new design - not disrupting the flow.
- 5 - The creation of activity, engagement, and community through the program selected.
- 6 - The integration of the building and nature, human-life, and the ecosystem. A new building must not disrupt its surroundings and the skyline it becomes a part of not to disrupt life within or on the streets below.





LESSONS FROM BANHAM

Banham is able to help us understand what concepts better define a megasturcture, but some of these concepts can be seen in the examples in DLR.

1 - 'A building that is deigned both internally and externally to host a variety of users in an easily adaptable manner' A lesson taken from Banham, Koolhaas' depiction of the Downtown Athletic Club fits this description to a Tee

2 - The idea of scale from Banham relates to the 1916 zoning code discussed in DLR; that once buildings start to reach this immense size, they must be filled with more than one purpose to include the scale of the human within the scale of the building and city. Hugh Ferriss' drawings depict what some might have thought as a megasturcture due to their sheer size.

3 - 'A design that can withstand the ever-evolving human race and its needs.' Although this lesson was taken from Banham, this ties directly to lesson #4 from DLR.

These are just a few examples of how lessons learned from Banham and Koolhaas overlap one another, showing that megasturctural thinking has been a part of skyscraper thinking all along. They were just categorized separately as two different typologies.





MILE HIGH TOWER - FRANK LLOYD WRIGHT

BACKGROUND

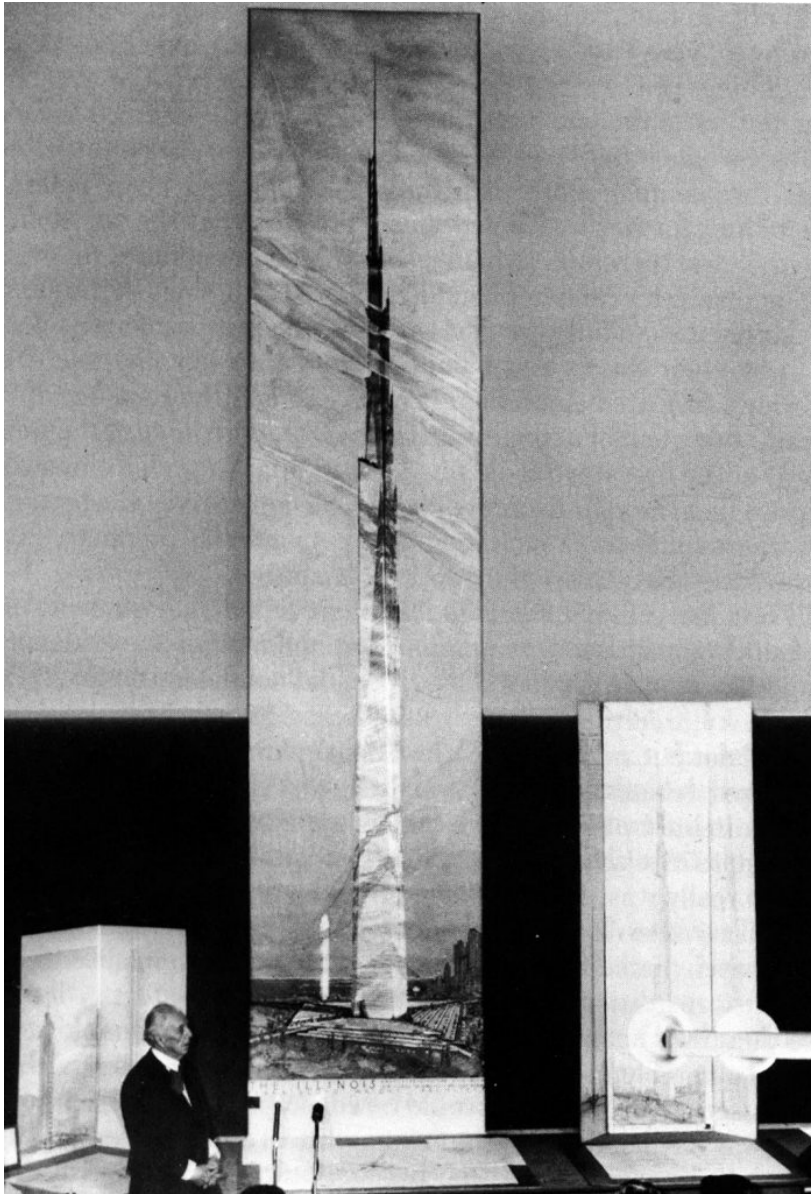
At the age of 89 years old in 1956, Frank Lloyd Wright unveiled his design for the tallest building in the world - a mile high skyscraper proposed for a site in Chicago named 'The Illinois'

What would become know as the Illinois Mile-High Tower, Wright's design would be built with 528 floors at 10 ft floor to floor heights accumulating a occupiable height of 5,280 ft. (1 mile) Not including the additional height of the antenna, the tower would stand four times taller than the Empire State Building - what was then the tallest skyscraper at 1,250 ft with 102 floors. At the project reveal, Wright presented a drawing measuring more than 25 ft tall, with the skyscraper drawn at the scale of $1/16" = 1'-0"$. Basic parameters for the tower were as follows:

Floors above grade - 528
Architectural Height - 5,280 ft
Gross height (with antenna) - 5,706
Number of elevators - 76
Gross floor area - 18,460,106 sqft
Number of occupants ~ 100,000
Number of parking spaces - 15,000
Core material - Reinforced concrete
Cantilevered floors - Steel
Tensioned Tripod - Steel

Source: Peter Lobner





Wright stands next to his 25ft tall drawing in October, 1956
Source: Peter Lobner





PURPOSE & PROGRAM

The Mile High Tower (MHT) was intended as a mixed-use skyscraper at the time of its design with the idea of spreading urbanization **upward** rather than outwards. Its immense size offered nearly three times the gross floor area (GFA) of the Pentagon, and more than seven times the GFA of the Empire State Building. The three primary uses of the tower were split into office, hotel, and residential. Wright claimed that all the office space in the tower was plenty to accomodate all government offices that were spread throughout Chicago.

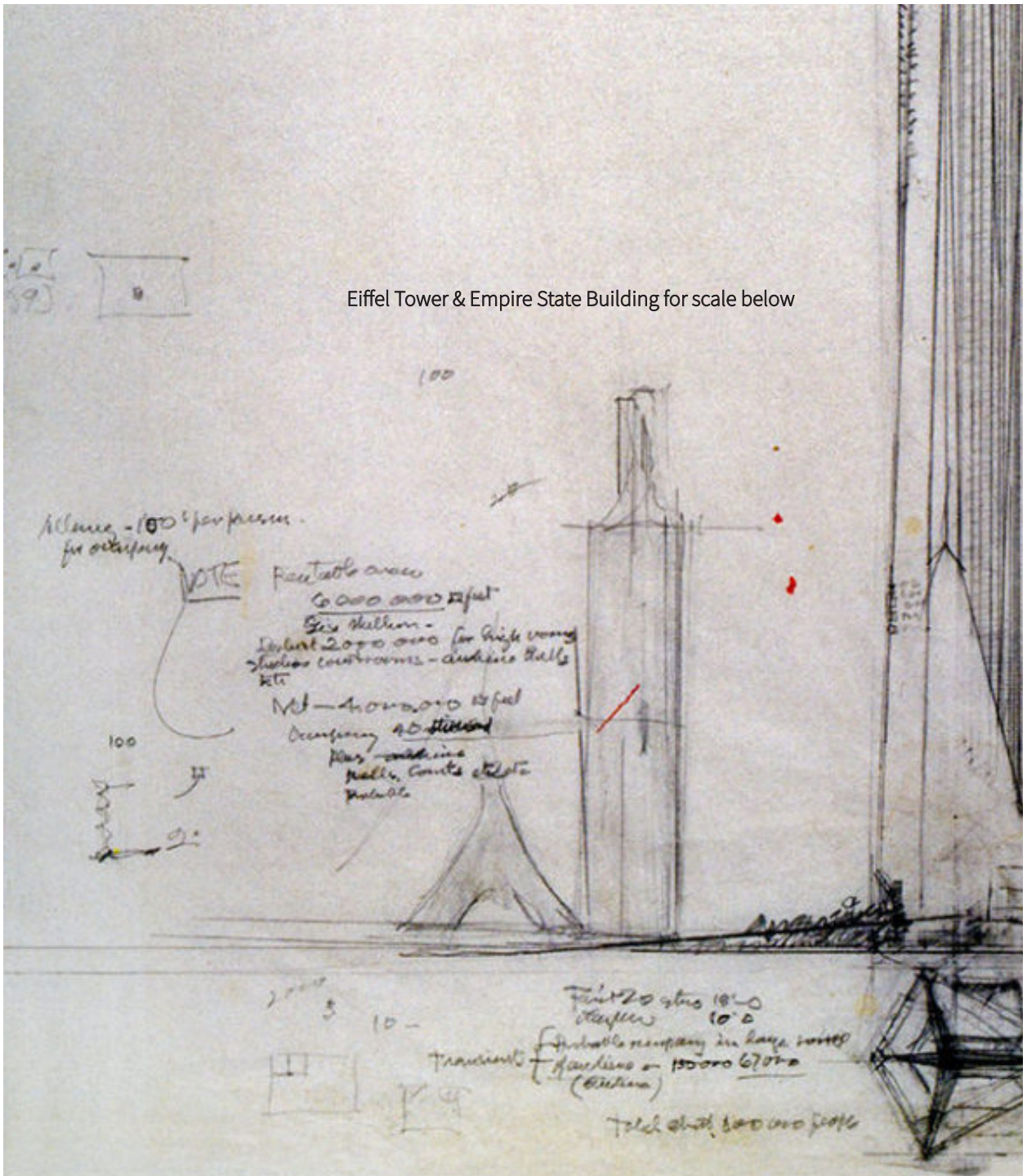
Before the idea of a 'supertall' was ever coined, the primary idea behind the tower's height was to reduce future clutter at the street level and to eliminate the need for other large skyscrapers nearby. Many see this idea as one that was born from his urban planning concept known as Broadacre City formed in the mid-1930's

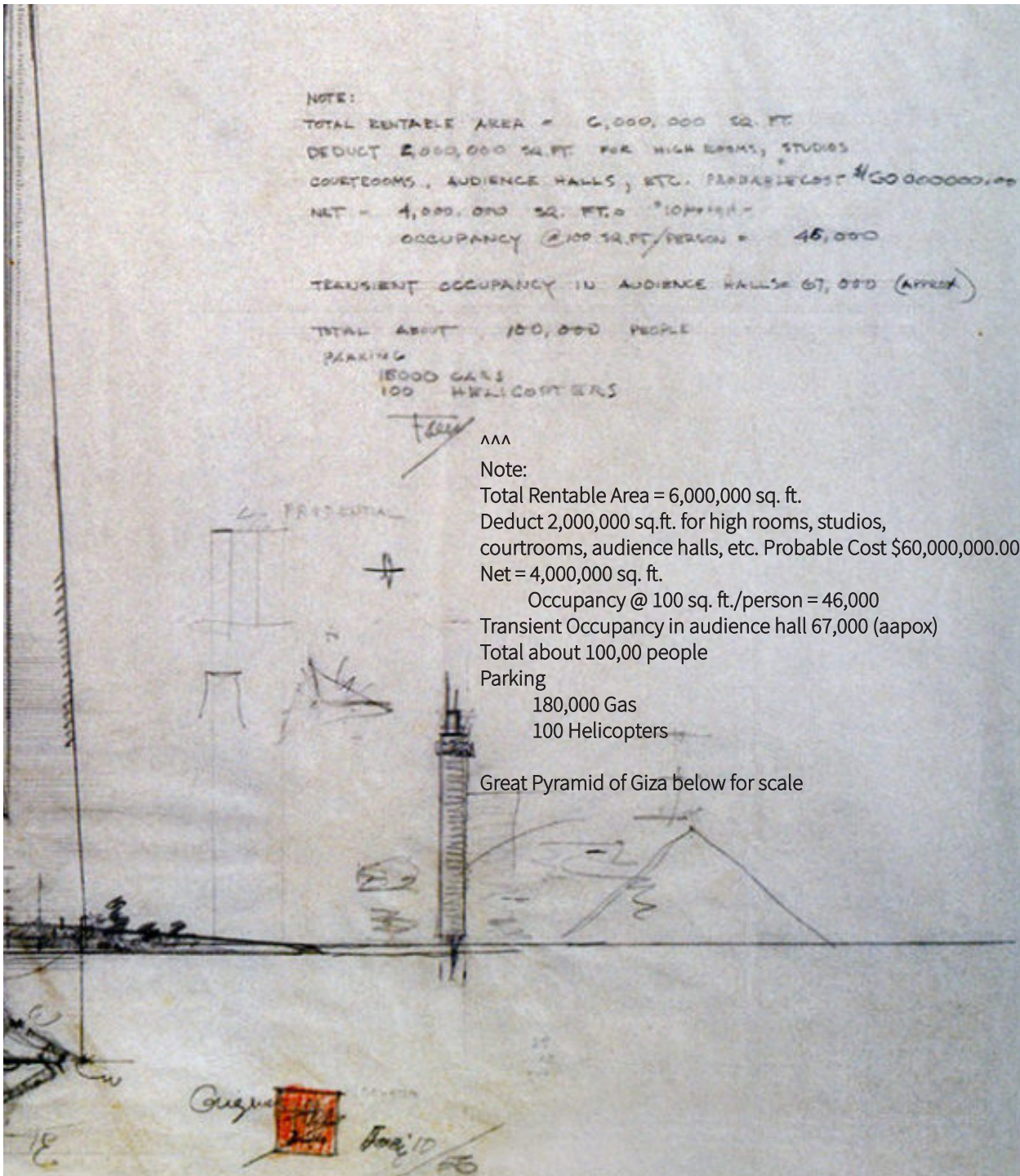
Source: Peter Lobner





Source: FLW - Wright Mile Gallery





THE ILLINOIS

MILE - HIGH CANTILEVER
SKY - CITY TO HONOR
THE STATE OF ILLINOIS
AND CITY OF CHICAGO

528 FLOORS FROM GRADE TO LAND-
ING OF TOP FLOOR ELEVATOR

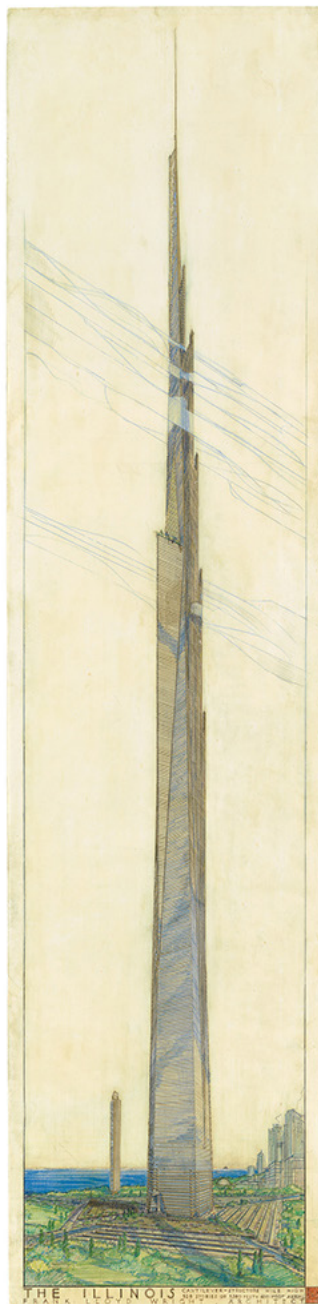
MEMORIAL TO
LOUIS H. SULLIVAN SON OF CHICAGO
FIRST MADE THE TALL BUILDING TALL
ELISHA OTIS
INVENTOR OF THE UPENDED STREET
JOHN ROEBLING
FIRST STEEL IN TENSION ON THE
GRAND SCALE, THE BROOKLYN BRIDGE
LIDGERWOOD NAVAL ARCHITECT
FIRST OCEAN LINER KEEL, MAKES
IT WHAT IT IS TODAY.
COIGNET & MONIER OF FRANCE
REINFORCED CONCRETE,
THE BODY OF OUR MODERN WORLD

SALUTATIONS
EDUARDO TORROJA ENGINEER, SPAIN
PROFESSORS BEGGS-CROSS
SCIENCE OF CONTINUITY
PROFESSOR PIER LUIGI NERVI
ENGINEER, ITALY
DR. J.J. POLIVKA ENGINEER
UNIVERSITY OF CALIFORNIA
MAILLART ENGINEER
SWITZERLAND

FRANK LLOYD WRIGHT SON OF CHICAGO
HONORARY DEGREE OF ENGINEERING
TECHNISCHE HOCHSCHULE OF DARMSTADT, GERMANY
HONORARY DEGREE OF ENGINEERING
TECHNISCHE HOCHSCHULE OF ZURICH, SWITZERLAND
FIRST SUCCESSFUL APPLICATION OF PRINCIPLE OF
CONTINUITY HORIZONTAL DERIVED FROM STEEL
IN TENSION APPLIED TO EARTHQUAKE-PROOF
CONSTRUCTION. THE PRINCIPLE OF THE CANTILEVER
VERTICAL APPLIED TO THE TALL BUILDING.
THE FIRST TAPROOT FOUNDATION.

STATISTICS :

GROSS AREA	18,462,000	SQ. FT.
DEVELOP. 5,000,000 SQ. FT. FOR KIOSK, STATION, RESTAURANT, COURT- YARD, AUDIENCE HALL, ETC.		
NET RENTABLE AREA	13,047,000	SQ. FT.
PROBABLE COST	70%	CONVENTIONAL COST PER SQUARE FOOT
OCCUPANCY	65,000	PERSONS
TOTAL OCCUPANCY IN AUDIENCE HALL	75,000	PERSONS
GRAND TOTAL	130,000	PERSONS
PARKING	15,000	CARS 100 HELICOPTERS

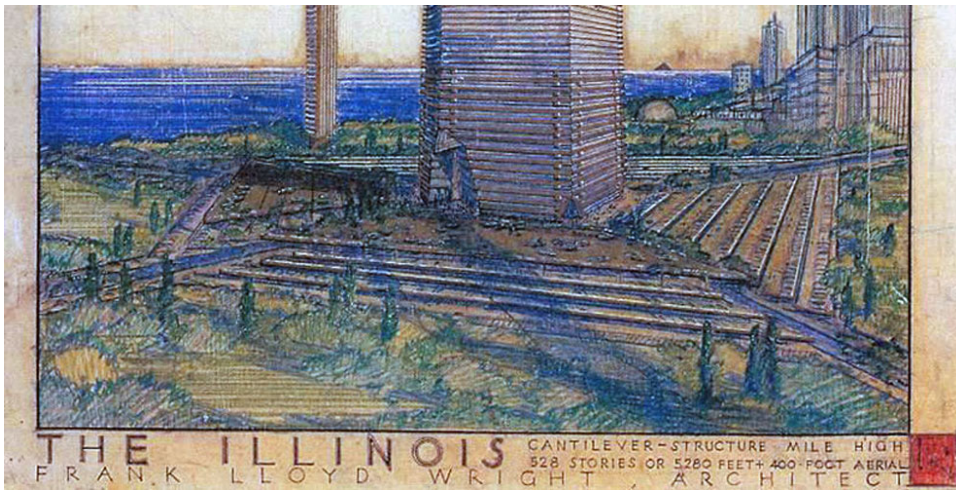


Wright's Illustration & Data Sheet - 1956

Source: FLW - Wright Mile Gallery



FLW Illustrations of The Illionois - 1956
Source: FLW - Wright Mile Gallery



Close-up of the Base of the Illinois - 1956

Source: FLW - Wright Mile Gallery

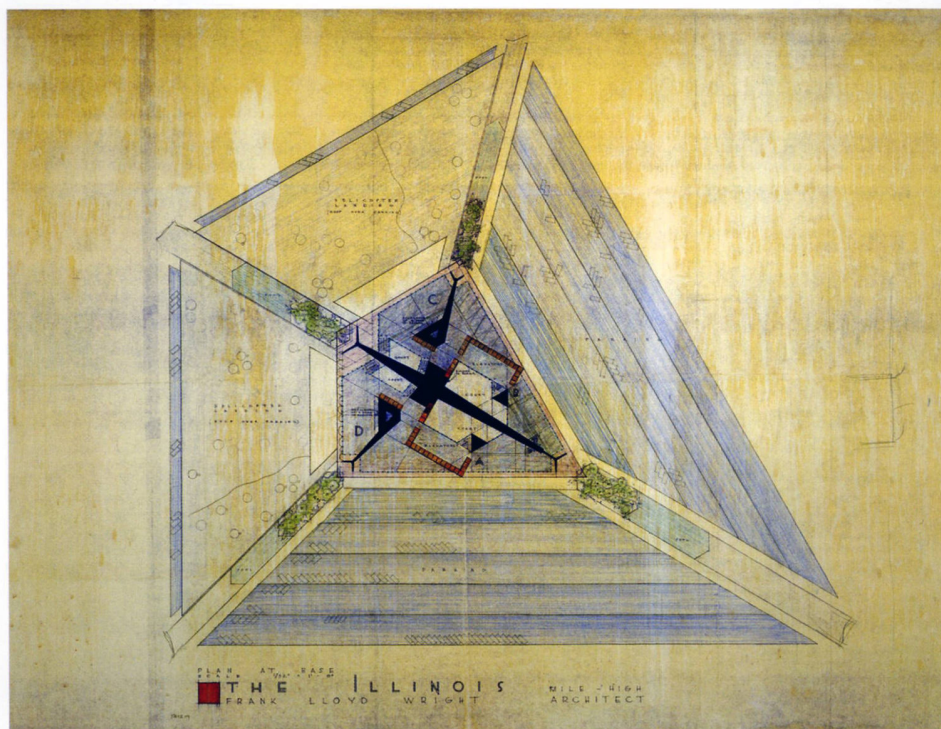


Illustration of Base & Tower - 1956

Source: FLW - Wright Mile Gallery



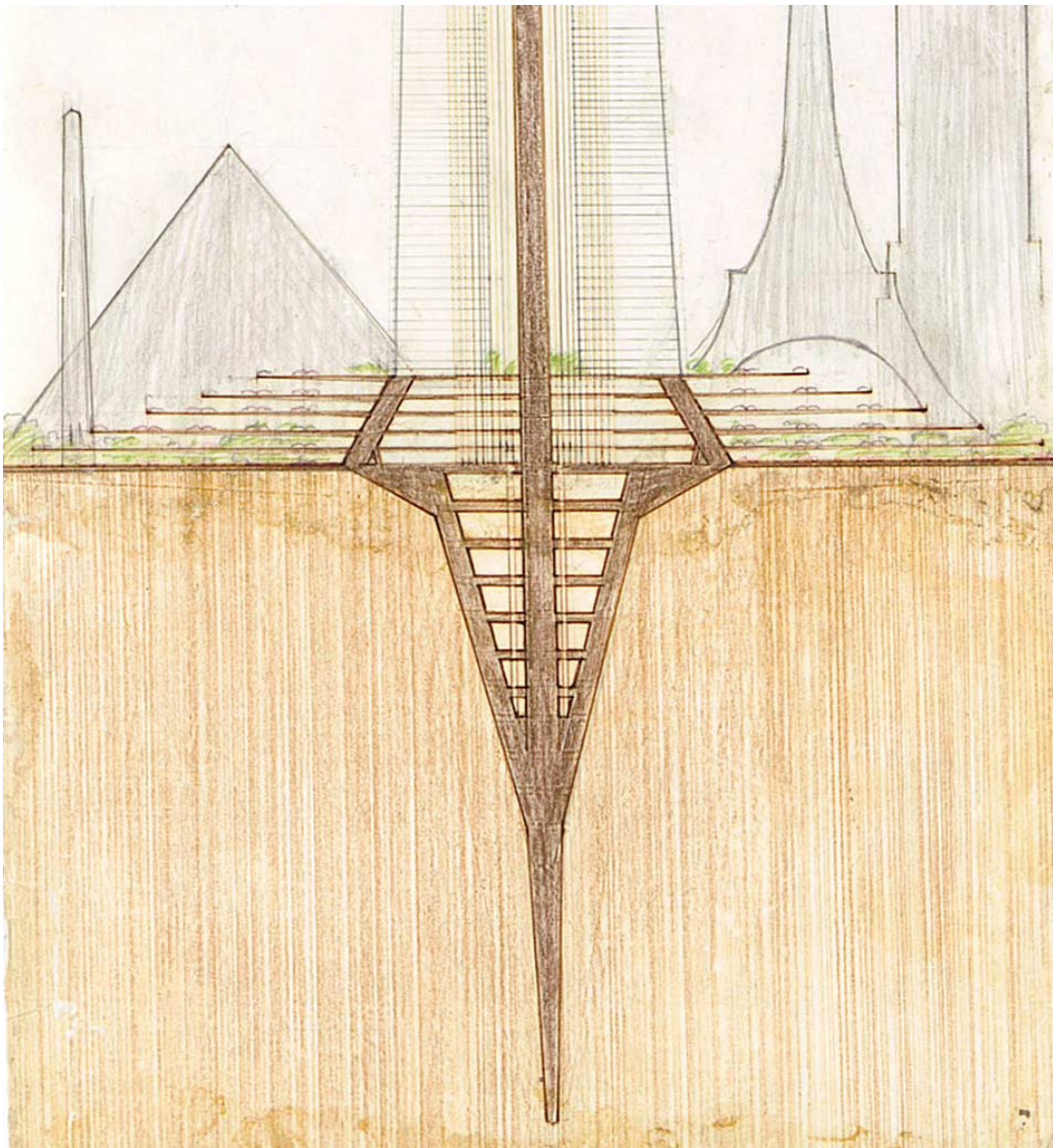


Illustration of Base in Section - 1956

An illustration in section showing the five-story base structure and the transition of the central reinforced concrete core into the foundation representing a 'taproot' structure. Scale figures of the the Eiffel Tower, The Great Pryamid, the Washington Monumnet, and the Empire State Building are shown in the background for a sense of scale
Source: FLW - Wright Mile Gallery



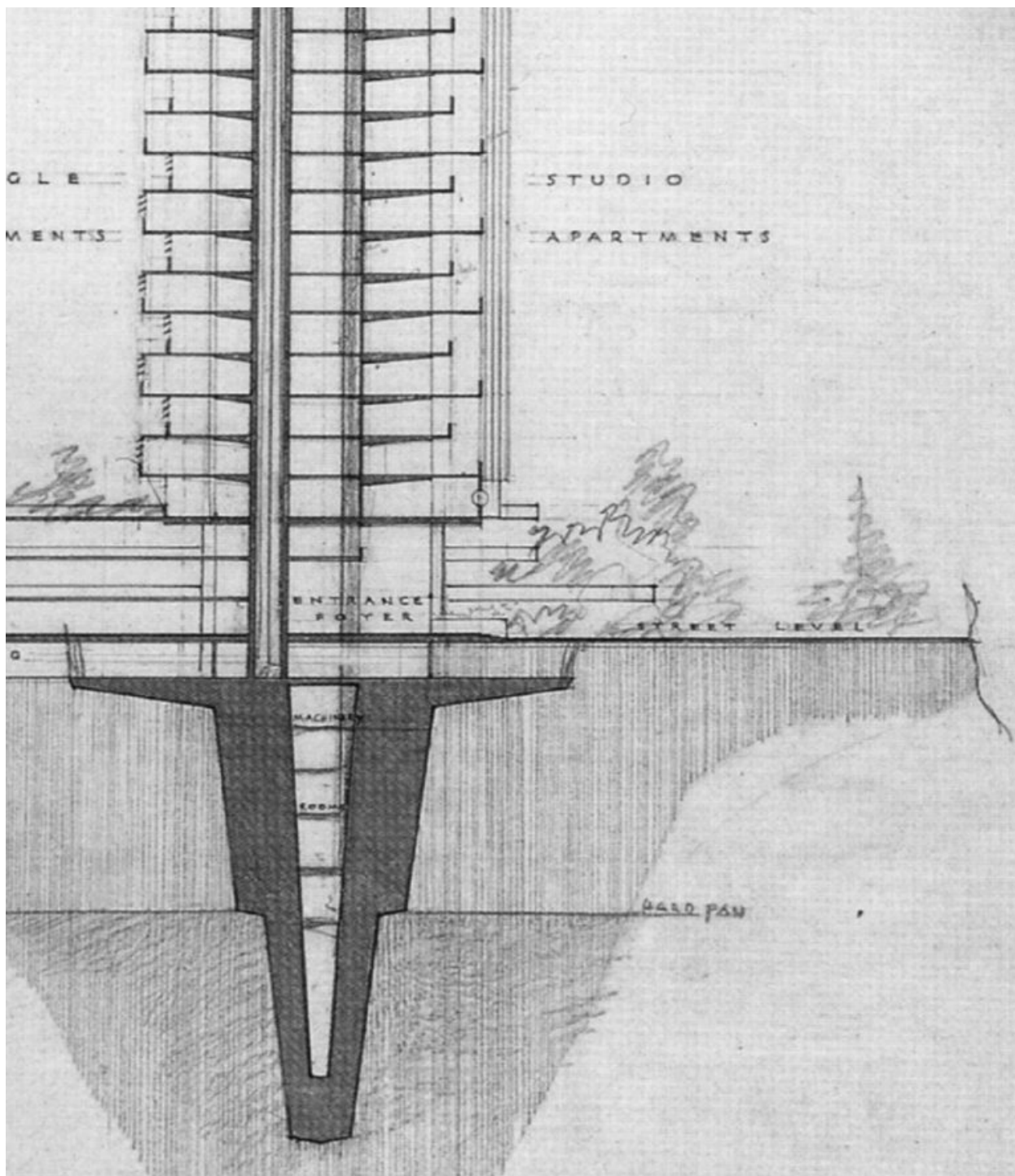


84

SIN
APART

FREE-
ECK
ARKING
LEVELS
SEMENT PARKIN







THE DETAILS

In modern day high-rise construction, Tuned Mass Dampers (TMD) are used to reduce sway in supertall structures due to lateral loads pushing against the large side surface of the tower. At the time of Wright's conceptual design for The Illinois, TMD's had not yet been invented, but that doesn't mean that FLW didn't think about the lateral loads the mile high skyscraper would face. His idea of a tensilized steel tripod was a timely solution to a modern day problem.

To handle the building's 100,000 occupants, The Illinois used 76 different elevators that were divided into five groups - each serving a 100-floor segment of the building while a single elevator served only the top four floors. Unlike typical elevators, these elevators were proposed five-story tall containers that moved on rails and served five floors simultaneously. In his 1957 book 'A Testament' Wright claimed the elevators were designed to enable building evacuation within one-hour in correspondence with the escalators that serve the lowest five floors.

Source: Peter Lobner





THE POTENTIAL

Reading about how much thought FLW put into this design makes it hard to believe that it was never actually built. I can't imagine how much anticipation (and backlash for that matter) this project ensued in the late 1950's. With so many great ideas behind purpose, construction, technicality, and location, the Mile High Tower was still lacking multiple imperative aspects needed to construct any building, especially one of this size .

Not only would the price of this tower reach the stratosphere, the project never had a client or a site. Even if these were established, a building of this scale would have been nearly impossible to construct in the 1960's, and definitely would not have been completed in Wright's lifetime. Even sixty years later, the race of supertalls have become familiar with the 1,000 - 2,000 ft tall range - but that's still less than half the height of Wright's proposal.

So although it never saw the digging for its taproot foundation system, the **symbolic** purpose and architectural **inspiration** behind the MHT will live on for engineers and architects alike as time grows and technology advances. Just because we aren't at the stage of building a mile tall doesn't mean we can't learn from Wright's ideas of the taproot and the tripod, the thought of filling a tower with **more than** one use-group, or the idea that one megatall building might be able to **reduce clutter** on the streets below. As supertalls and skyscrapers become more and more feasible with each decade, FLW's half-decade-old year-old ideas can still carry on through future urban projects and planning.



THE SUPERTALL

WHAT MAKES A SKYSCRAPER?

OVER 600M
MEGATALL

OVER 300M
SUPERTALL

OVER 150M
SKYSCRAPER

To qualify as a skyscraper
buildings must be freestanding and rise
taller than 150 metres. At least 50% of
their height must be habitable.

As defined by CTBUH

**30
ST MARY
AXE**
LONDON

179.8M

**CENTRAL
PARK
TOWER**
NEW YORK

472M

**BURJ
KHALIFA**
DUBAI

828M

Defining a Supertall

Source: The B1M - 2022





SUPERTALL

Supertalls are becoming the norm of high-rise buildings all throughout the world, and it seems that any new tower being built falls within the category of a supertall anymore. We may not yet be at the size of *The Illinois*, but as these towers grow taller and taller with each new design, it's worth asking the question, 'If these towers are so grand and advanced in technology, why aren't they considered megastructures?'

After analyzing the texts from Koolhaas and Banham, I think the answer to that question has to do with the **program** these buildings are being filled with. Many supertalls today consist of only two different program types - office space, or high-end residential and for that reason, don't fit the classification of a megastructure.

It quickly became clear that for a building to earn the 'megastructure' classification, it must not only be a building grand in size, but must also house space that is interchangeable, **flexible**, or modular. If a developer is spending billions of dollars to build a 1,200 ft tall skyscraper in midtown, they better plan on building a mixed-used tower that is meant to last rather than a luxury hotel if they want their megastructure badge.





A NEW TYPOLOGY

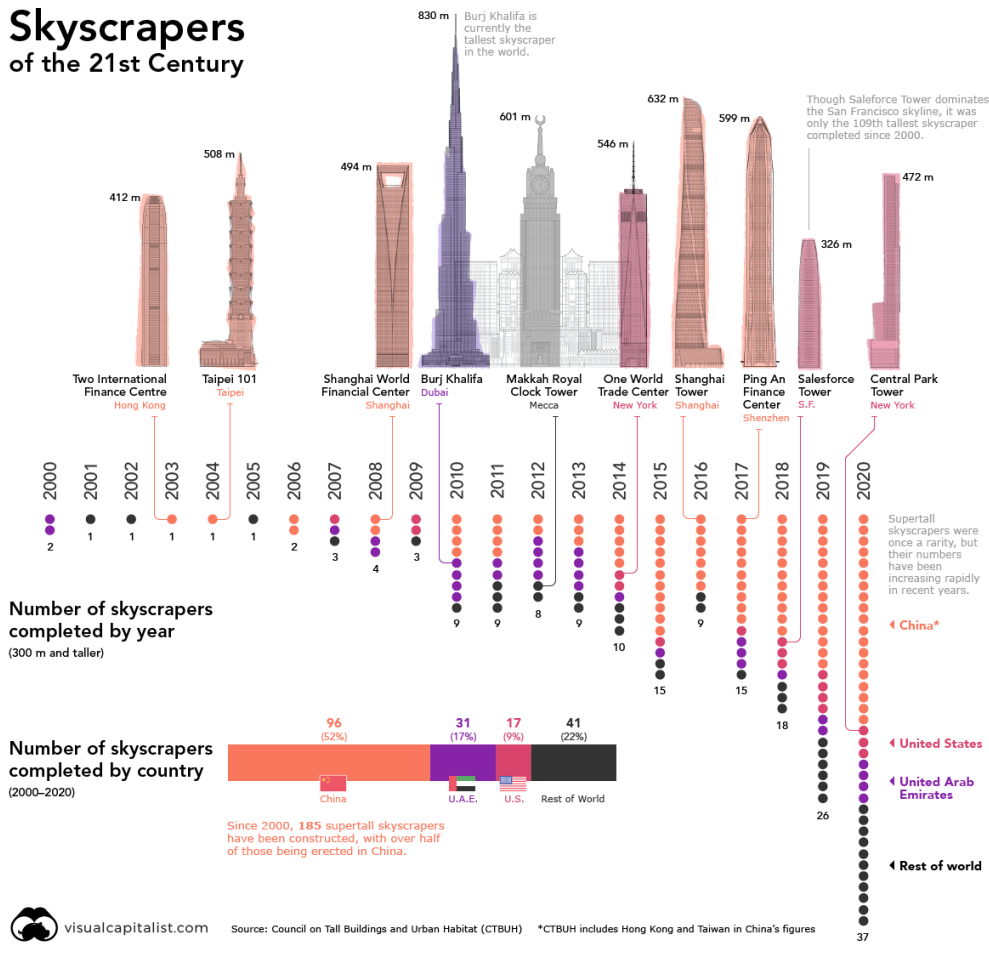
Still holding interest in the idea of something that is grand in size and is able to house a variety of typologies, as well as the initial thoughts of adaptive reuse and brown field remediation, I veer toward the idea of a **supertall** that inhabits the goals of an **adaptive reuse** campus and the **megasturcture** lessons learned from Banham and Koolhaas. Perhaps the idea of a mixed-use adaptive reuse campus can be incorporated into a tower - an idea that modern supertalls have adapted where a new tower is built with nothing around it.

At the completion of the tower, the surrounding area becomes a bustling community and attraction with the **landmark** tower as the community's **centerpiece**. Rather than building a tower in the middle of the Sahara Desert, I believe it would benefit more if a project of this scale were built on a brown field - one that previously served as America's **heartbeat** of industry.

However, a site must be chosen to reflect its **programatic** needs. If constructed in a highly populated city, the driving program would be forced to residential and office space - defeating the purpose of a mixed-use and flexible floor plate.



Skyscrapers of the 21st Century





SHADOWS OF A SUPERTALL

Although supertall towers (A tower between 984 and 1,965 ft tall) have their perks when it comes to **maximizing** footprint to area ratio (FAR) and the possibility of achieving tremendous heights through innovative technologies and engineering, they do come with their fair share of cons.

The number one con that is seen with these structures is the cost. Cost may originally not be the first thing that the average citizen thinks about with these structures, but the cost of building taller, skinnier, and more luxurious is an outlandish number that comes with the construction of these towers.

On top of the cost to construct them, a tower of this typology commonly has high desire in a location with very limited amounts of land available - New York City, Chicago, Shanghai, London, etc, where land is sometimes more expensive than the construction of a normal skyscraper.





Building	City	Floors	Height (meters)	year	Cost (\$Billion)	Cost per Floor (\$ million)
One World Trade Center	New York City	104	541	2014	3.9	37.5
Shanghai Tower	Shanghai	121	632	2015	2.4	19.8
The Shard	London	73	306	2013	1.9	26.0
Taipei 101	Taipei	101	509	2004	1.8	17.4
Burj Khalifa	Dubai	163	828	2010	1.5	9.2

Cost per Floor of Well-known Supertalls

Source: Oscar Soberg - Michigan Journal of Economics - 2022

FINANCES

With each new supertall, the cost per floor seems to climb as the building gets taller, but why? One would think that if more floors are built and repeated over and over, that the sense of consistency in layout, materiality, and construction would save a developer money, not cost them more.

This is especially true in Manhattan due to the highly desirable views of Midtown, but the reason the cost goes up the higher one builds is due to this reason in particular. Residential supertalls don't help themselves out at all either by placing \$200 million penthouses at their highest floors. At the cost of the current supertalls in existence today, developers are having more and more trouble filling them with tenants - whether it be commercial or residential - due to the high lease/rent prices in attempt to achieve a return on their investment.

Maybe if supertalls were organized in a way that the floors with the most desirable views were reserved for **public** areas, not a private penthouse, these towers would be easier to fill. I think supertall developers would benefit from equally **distributing** wealth in their towers rather than reserving the cherry on top for the uber rich.





ENSURING OCCUPANCY

A vacant supertall will never turn a profit, so securing leases or purchases is often the deal maker, or breaker. In the US, developers are required to lease up to 50% of the building in advance of construction in order to secure enough funding from investors to fund such an expensive project.

Source: Iman Ghosh - 2020

ATTRACTION TO BUILD TALL

Developers & investors are drawn to supertalls over comparably smaller skyscrapers for two simple yet relevant reasons: they are ridiculously tall and have the potential for a maximum return on investment. Building tall is a way for developers and firms to put a lasting **stamp** on the skyline of the city of choice and can even act as an **advertisement** for a company or individual person.

Source: Iman Ghosh - 2020



STATUS

Although status may not single-handedly pay back the hundreds of millions of dollars invested to a project, status does provide an increase in **value** to the neighboring properties as developers often not only own one specific site, rather they own a site and some or most of the area surrounding it. Therefore, by building and owning a supertall, the potential to earn profit from the property and its surroundings is increased.

Source: Iman Ghosh - 2020

TIMELINE

Supertalls can often have timelines that stretch over a decade from thought to the grand opening. The issue with a timeline of such length is the concept of an un-promised future. For example, if a supertall is constructed of mainly concrete and a recession hits in six years and prices of concrete soar, this throws an instant wrench in the plans, budget, and timeline of the building.

Source: Iman Ghosh - 2020



ENDGAME OF HEIGHT



Burj Khalifa

Adrian Smith - Dubai, UAE - 2009





BURJ KHALIFA

Many supertalls are built with one primary goal in mind - building taller than their neighbor. Although this sounds greedy, it is far too common and often finds developers taking as many shortcuts as possible to achieve such extreme heights. Below are all passages about how the *Burj Khalifa* - currently the tallest building in the world - was able to take shortcuts to achieve its height along the smoothest possible path.

Although the building has plumbing, it is not hooked up to a city-wide sewage system because the plumbing required to reach the top floors would exceed costs within an accepted limited. That means that all waste produced in the building must be transported out of the city by truck.

- Although the building has 163 separate floors that achieve roughly 16ft of height, the top 39 floors are unoccupied. The highest occupiable floor is at level 124 - the location of the observation deck. The top 39 floors are used for what the building calls 'broadcast & communication devices'. At this ratio, almost 25% of the building is unoccupiable.

- At a cost of \$1.5 billion in 2009, the Burj Khalifa was not only the tallest building in the world, but was also one to showcase the pure wealth and power of the United Arab Emirates. Considering that the building is indeed a mixed-use tower, it was meant to be a symbol of wealth and luxury for the UAE, and they felt that having the tallest building in the world would be the only way to prove it. Although some represent the aspect of height with wealth and power, and others feel they are closer to God at the top of these buildings, it sounds selfish to build the tallest structure in the world because 'I wanted to'.

Source: Samantha Frew - Architizer





SHORTCUTS IN NYC

"All eight of the towers were missing final signoff from the Department of Buildings on elevators and plumbing; seven did not have final signoff on fire sprinklers and standpipes; and five were missing approvals from the fire department."

"Obtaining a final certificate of occupancy is the end goal, but the city's tallest residential buildings rarely achieve it. Since 2012, among new residential buildings with at least 25 units, 3,586 buildings, or 77 percent, obtained the final certificate. But only 3 of the 25 tallest residential buildings, or 12 percent, did the same."

"The answer is, I don't know how safe these buildings are, and nobody does. Nobody really knows what they're truly approving."



Source: Stefanos Chen: New York Times - 2021





"An earlier New York Times investigation of 432 Park Avenue, a nearly 1,400-foot condo tower with more than 30 incomplete oversight tasks required by the Department of Buildings, revealed multimillion-dollar floods caused by plumbing defects, malfunctioning elevators, and claims by an engineering firm of 'actual life safety issues,' which generally refer to problems with sprinklers, egress, or other fire-related issues that can be life threatening in some circumstances."

"For decades, as a way to expedited development, the city has allowed developers to close on units and begin move-ins with a T.C.O., a provisional, typically 90-day pass that says at least part of the building is safe to inhabit, but that outstanding requirements remain."





A SUPERTALL ON FIFTH AVE, EAGER TO BE A GOOD NEIGHBOR

KPF - Manhattan - 2021

A rendering of the building proposal adorned with arches and setbacks nodding to classic New York City architecture.

520 Fifth Ave, New York
KPF, 2021

A rendering of the building proposal adorned with arches and setbacks nodding to classic New York City architecture.





BACKGROUND

“Embellished with archers and terraces” - adding another supertall to the mix while paying tribute to the early skyscrapers of Manhattan.

“At 1,002 feet tall, the building is the second tallest on Fifth Ave after the Empire State Building. It’s also the tallest residential building on fifth Avenue, and is slated to be completed in 2026”

AESTHETICS

“...the slender structure which sits on a quarter-acre lot, is adorned with arches and setbacks, **nods to classic** New York City architecture. The archers are made of glazed terra-cotta on the lower floors, before switching to painted aluminum with bronze extrusions on higher floors. The buildings **resonates** with nearby buildings like Grand Central Terminal, the Fred F. French building and the Century Associations nest door...”

For a structure that will stick out in the most famous skyline on the planet that is visible from miles around, it is imperative that it does not disrupt the skyline. Matching the **fabric** of its neighborhood and falling back on classic zoning rules is a good way to make sure this doesn’t stick out like a sore thumb.

Source: Matt Yan - New York Times



Exterior Photo of the Construction Progress

A drone shot with the supertalls of Central Park Tower (L) and 270 Park Ave. (R) beyond
Source: Katherine Marks - New York Times





PROGRAM

“The building has office space on the ninth through 24th floors and residences from the 42nd to 80th floors. Two floors above and below the lobby and retail space, there will be a members club called Moss, featuring a dining program... Along with other amenities like a spa and athletic club. And on the 88th floor, residents will have access to an amenity suite, complete with a solarium, a game room with a vintage billiards table, and a private dining room.”

“We took the top floor of the building, which is the most valuable residential floor, and turned it into a **common amenity**... Whether you’re buying on the 40th floor or the 70th floor, you can still go up and enjoy that view”

Does a diverse program like the one of this building give it the necessary flexibility to be classified as a megastructure? To me, the answer is still no, because although this is a mixed-usesupertall, mixed-use doesn’t necessarily mean flexible. According to the studies of megastructures, a space must be **adaptable** and flexible for the users of today and tomorrow to be considered a megastructure. That being said, I think the ideas of a variety of programs and saving the top floor for **all users** rather than one particular user is a huge step in the right direction. Perhaps if the building housed more flex-space that could be adapted and rearranged as needed, it would earn its megastructure badge.

Source: Matt Yan - New York Times



APPEARANCE

“I think all tall buildings, especially, have a kind of **responsibility** that goes beyond the program and the site. Because once you emerge into the skyline in a significant way, which this building will, the skyline is almost viewed, I think, by us New Yorkers as public property. If you put up a terrible profile on the skyline, everybody has to look at it from uptown, downtown, Long Island, New Jersey. And it’s very subjective but we feel we should be doing something to **grace** the skyline, not to give it some defect.” - James von Klemperer, KPF

- Expanding on James’ statement, I think a building of this height isn’t viewed as public property to New Yorkers alone, but also to anyone that even visits New York. Buildings like these become landmarks which strike a sense of **belonging** and activity to anyone who sees them. I also think that the idea of gracing the skyline may be a reason that many megastructures of the 60’s era did not see fit. When proposals were seen for those buildings, they were rejected because people were worried they would do more harm than good, even it came in the sense of the appearance of the skyline. Something as simple as designing a building to blend into its context rather than completely out of the ordinary may be a tactic that could help more megastructure-esque buildings be built.

Source: Matt Yan - New York Times





Interior Rendering of the Amenity Suite

Located on the 88th floor, and accessible by all building occupants
Source: KPF & Binyan Studios





APPEARANCE

“A first-order principle for us was: Don’t do a glass and metal curtain wall building, which is what everyone expects you to do in Midtown. I think that was somewhat prompted by the residential because we wanted to give it somewhat of a more comfortable feel. But I think it was also just a reaction against what people identify as a somewhat commodified form of real estate development - to try and do something that felt distinctive and unique and also kind of **human**.” - Ian Klein

Source: Matt Yan - New York Times





An approach of this order is one that is not often seen in a place like New York. Curtain wall skyscrapers have become the norm since the 70's and on more and more, and its very rare to find a modern-day skyscraper without this system in play. What this does though, is bring the **scale** back down to the human. Curtain walls suggest that there are no distinct floors or rooms, as the glass is meant to give off a sleek and seamless idea. Once floors and rooms become distinct on the exterior of the building rather than just in plan, the scale of the building is re-imagined to include that of the **human**, all while the human scale is layered within the larger scale of such a monstrous structure - reflecting on Banham's ideas of scale in a megastructure.





108

THE BOARDWALK AT BRICKTOWN - LEGEND'S TOWER -

AO Architecture - Oklahoma City, OK - 2023

BACKGROUND

The Boardwalk at Bricktown is a proposed mixed-use development In Oklahoma City, OK that includes what would become the tallest building in North America if built. Staged as a multi-phase project, the new development was proposed in 2023 and was approved in early 2024 to start construction after long-fought battles of zoning changes to go above the height cap.

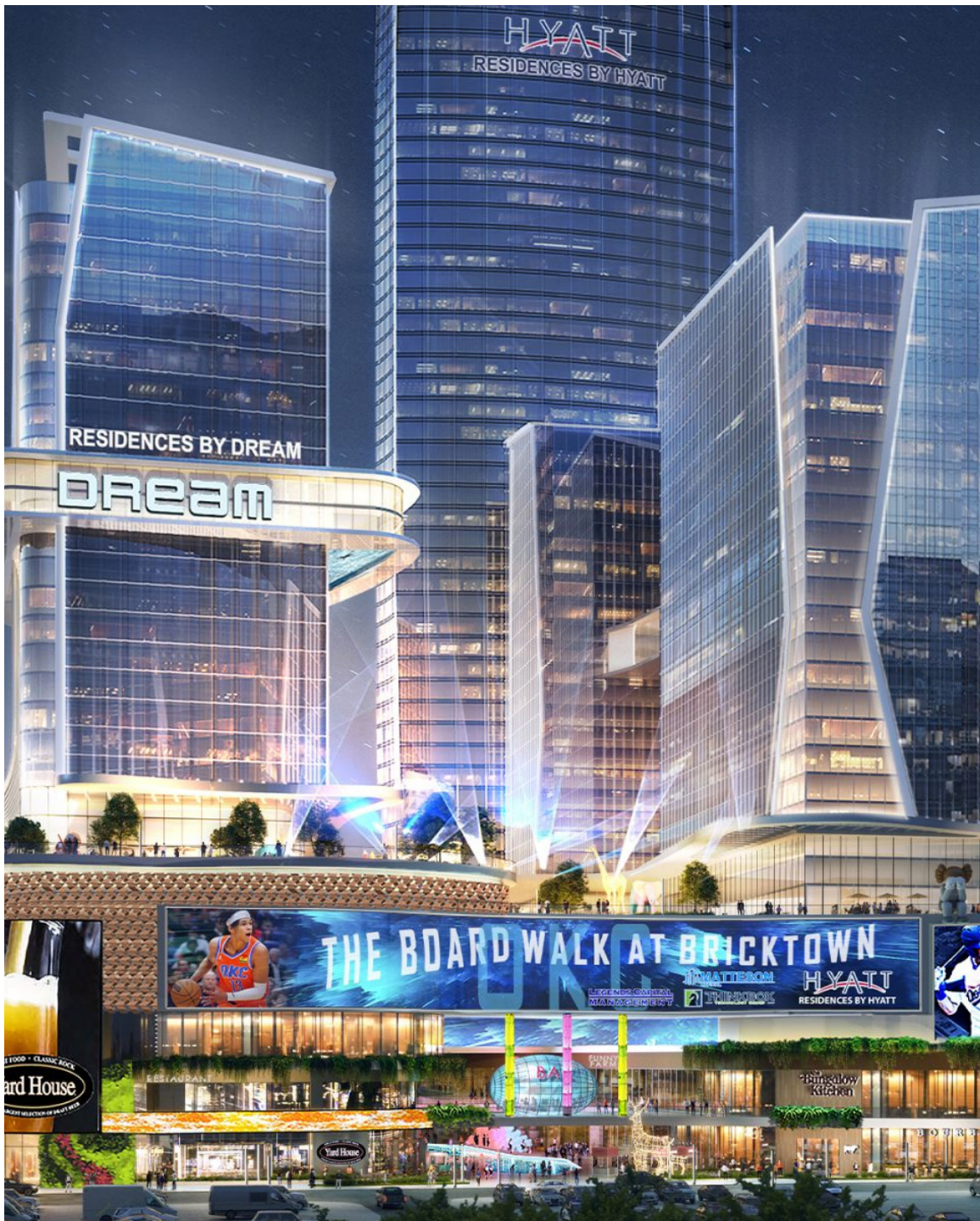
Originally proposed at 1,750 ft, the revised height of 1,902 ft is meant as an **illusion** to the fact that Oklahoma became a state in 1907. At this height, it would surpass the height of One World Trade Center at 1,776 ft - an homage to the year America gained its independence.

“We believe that this development will be an iconic **destination** for the city, further driving the expansion and diversification of the **growing** economy, drawing in investment, new businesses, and jobs. It's a **dynamic** environment and we hope to see the (site) stand as the pride of Oklahoma City.”

The whole idea behind this project, and the exact reason for its site selection revolves around **commerce** and **interaction** - an idea that was looked at early in the analysis of adaptive reuse campuses and mega-structures. A project of this scale is proposed in Oklahoma City - a rather lesser-know city on the scale of 'large cities', it has even more opportunity for **growth** because it is a much less populated area than Manhattan.

Source: Matteson Capital







PROGRAM

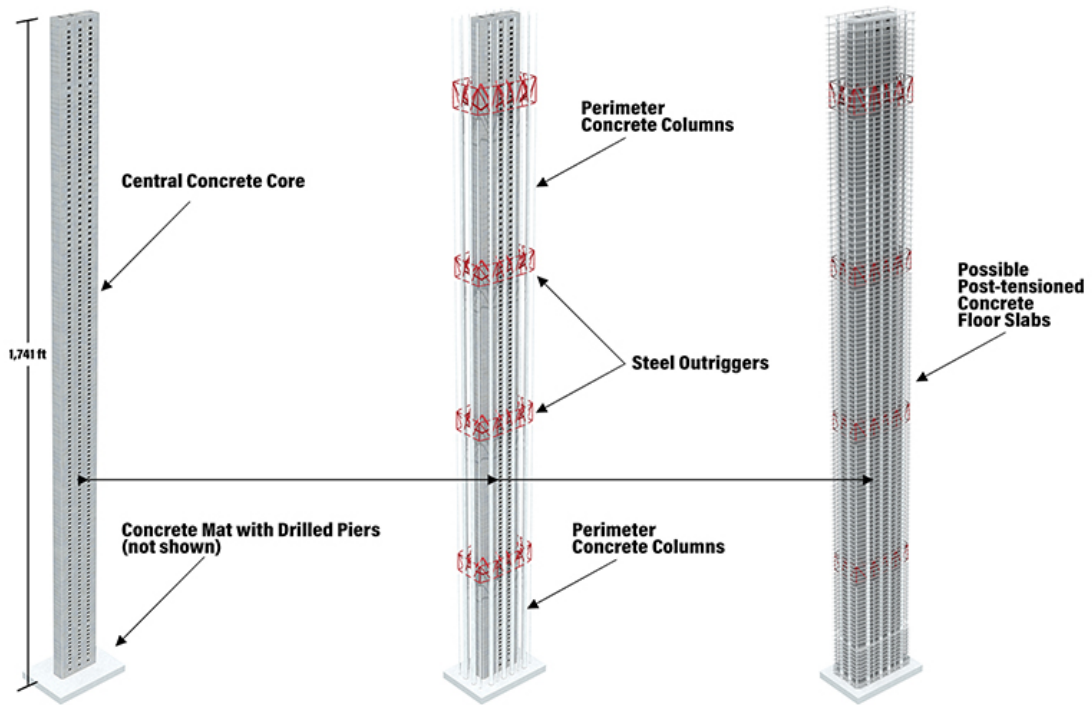
Legends Tower is planned as a **mixed-use** supertall including a 350-room Hyatt hotel, 1,776 apartments, and over 110,000 sqft. of retail stores, restaurants, and civic program. The top floors of the building would feature a restaurant and an observation deck with views of the city. The entire complex would cover just over 3 acres including three smaller buildings each rising to around 350 ft. These buildings would house another hotel, additional retail and restaurant space, open plazas, parking garages, and a new arena for the OKC Thunder- NBA.

The first stage consists of the three smaller towers - each including a 23-story tower above a retail **podium**, while the second phase would be solely for the Legends Tower consisting of 126 floors above its respective retail podium. Although construction was planned to start on phase 1 in 2023 with phase 2 starting in the summer of 2024, construction has not yet started on either phase. However, plans are still moving forward to begin construction as it awaits land deals and multiple permits from Oklahoma City.

Although this supertall consists of a very **diverse** mixed-use program, it's still lacking some of the flexible ideals of a mega-structure. However, I think the idea of placing a restaurant and observation at the very top is a great idea for the **public** and tourists alike, and I think the idea that this tower could jump start a community by pulling in commerce, creating jobs, and encouraging interaction, as well as **attracting** people from outside of Oklahoma is the basis of what megastructures of the 60's used to strive for - the idea that one building (or complex) has the ability to impact a city forever. It's also interesting that all of these towers employ the idea of a tower atop a lower **plinth**, a theme that was seen in some of the early skyscrapers of the 20th century.

Source: Kathryn McNutt - The Journal Record





Source: Ola Johansson - Senior Principal at Johnson & Associates Engineering

STRUCTURE

- At the height of 1,906 ft, the current aspect ratio is 18:1 - considered a slender supertall which requires a more sophisticated performance-based structural design approach which exceeds typical building code requirements. Like any supertall, the structural system is designed in particular to withstand lateral wind loads including tornadoes and seismic loads expected to occur at the site. The design calls for a high-strength reinforced concrete structure with a central core, with walls 3-4 ft thick, connected to concrete perimeter columns with structural steel outrigger braces at four tower elevations. The post-tensioned concrete floor plates are column free - with the tower's columns embedded either in the walls of the exterior or the central core. The foundation mat will be built approximately 20 ft thick and will rest on a grid of drilled concrete piers extending roughly 60 ft below grade into bedrock.

Source: Ola Johansson - Senior Principal at Johnson & Associates Engineering





112





A NEW TYPOLOGY

Although there's nothing new around the idea of filling a skyscraper with apartments, VIA 57 West is a hybrid between the perimeter blocks of Europe and the traditional 'wedding cake' skyscrapers of Manhattan, thus creating a typology known as the 'courtscraper' - a skyscraper with the central core completely open air. With this typology the benefits of both are **combined** - the compactness, density, and intimacy of a classic courtyard building, with the open, expansive views provided in a skyscraper. Keeping three of the four corners of the building low allow the courtyard open views of the Hudson and avoids disrupting the view the building's neighbors. The sloping roof consists of a simple perforated surface filled with terraces. Each unit has its own south-facing terrace; something made possible by the interior core of the building being hollowed out.

ZONING

Placed on a rather challenging site, VIA 57 West resolves issues related to an uneven plot of land in a flood-evacuation zone, bounded by a power plant, sanitation facility, a heavily-trafficked highway, and a residential tower. Originally zoned for a low-rise residential building, the project team was able to secure modification to existing zoning restriction and develop a high-rise tower adding hundreds more units, ultimately **re-imagining** what large-scale residential buildings could achieve; especially in Manhattan where typical high rise residential structures often limit the daylight and fresh air brought into their buildings, nor provide any sort of courtyard, interior green space, or every apartment with a terrace, daylight, fresh-air, and views.

Source: The Plan



SUSTAINABILITY

Constructed with recycled, renewable, and locally-sourced materials wherever possible, the stainless steel facade is 100% recyclable with no down-cycling. On top of its recyclability, the facade also maximizes natural **sunlight**, while low levels of VOC's contribute to optimized air quality. EnergyStar-rated appliances and low-flow plumbing fixtures are installed in all residential units, and a highly efficient mechanical system utilizes multiple energy saving techniques. High performance glass, occupancy sensors in common areas, and a hybrid water source heat pump offer a contribution to further energy savings. The structure also utilizes a rainwater collection system that is then used for on-site irrigation and cooling towers.

Sustainability was not forgotten when construction started, as an optimized diversion of material debris from landfills was established with each contractor to ensure options for reusable, recyclable, biodegradable, and reduced packaging products. A pilot program was also installed where gypsum wall board scraps were separated from other debris on-site during installations and recycled into new GWB. To minimize overall contamination during construction, indoor air quality control measures were implemented, sanitary and storm sewers were protected, and residual water was treated prior to dis-

Source: The Plan





View of the Central Courtyard Overlooked by Terraces

Located on the 3rd floor, and accessible by all building residents
Source: Starr Whitehouse

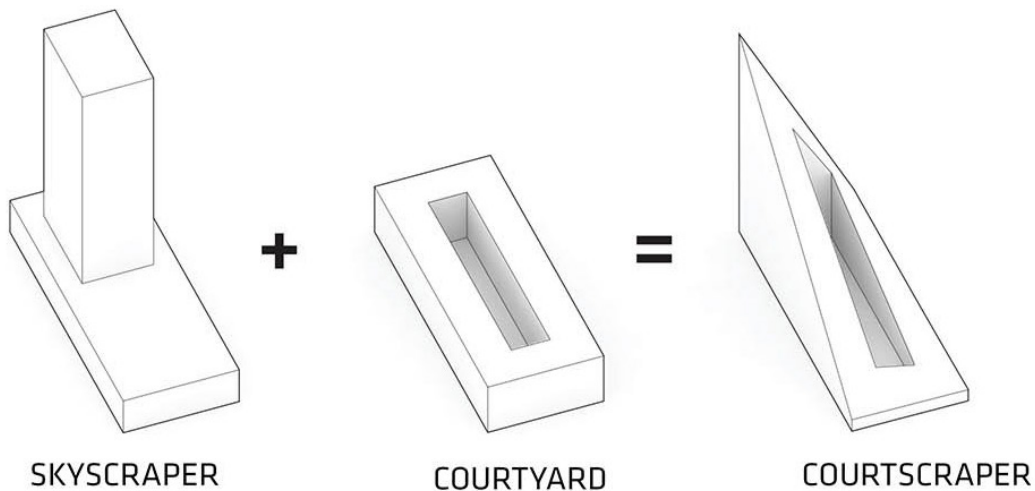




CONSTRUCTIBILITY

Another aspect unlike a typical skyscraper, the project team approached the facade by thinking of it as both wall and roof, and applied and developed sophisticated technologies to solve challenges related to the sloped facade's constructibility, maintenance, and water management. The North edge of the roof acts as a rail for exterior building construction, maintenance, and water management. The slope had to be regulated for safety against wind and gravity, so the team defined 'gravity lines' by simulating the free fall of several spheres along the facade and tracing their movement. As a result, the gravity lines identified the ideal tracks for the platform to guide along and bound the terrace openings.

Source: The Plan

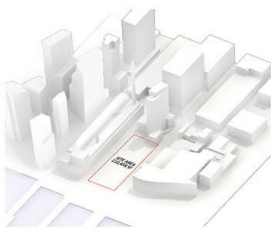




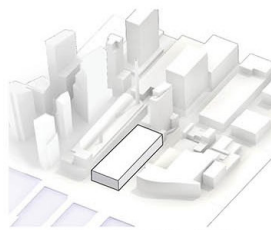
CONSTRUCTIBILITY

A prefabricated system was determined to be the best construction solution due to the thousands of unique pieces that compose the facade. In total, the facade consists of 1,207 unique panels and 6,000 custom stainless steel panels. Through the process of 3D laser tracking, the project team was able to precisely size each and every piece of the facade before construction, and was able to label and track each individual pieces from its conception in digital software to its final installation on site.

Source: The Plan



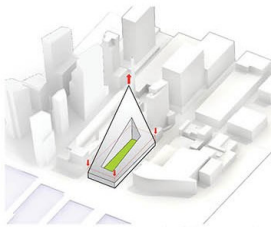
SITE



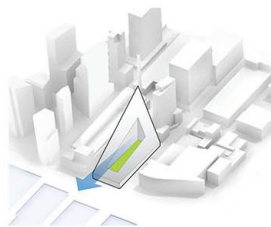
PROGRAMMATIC VOLUME



COURTYARD TYPOLOGY IN THE
MANHATTAN GRID



PULL UP NORTH-EAST CORNER TO
OPEN UP COURTYARD



PRESERVE VIEWS FROM ADJACENT
CLIENT BUILDING



SOUTH-FACING VIEWS &
SUN LIGHT





BROOKLYN TOWER

Shop Architects - Brooklyn, NY - 2021

A view of the contemporary-gothic/art deco tip of the tower overlooking Lower Manhattan



118







BACKGROUND

A primarily residential, considered mixed-use supertall, Brooklyn Tower is a 1,066 ft supertall built atop the Dime Savings Bank in Brooklyn, New York. The tower is the first supertall, and the tallest building in Brooklyn, as well as the tallest building in the city outside of Manhattan. In this particular project, the tower houses approximately 150 condominiums and 430 rental apartments while the interior of the Dime Savings Bank contains the building's 120,000 sqft of amenity space. This annex between the original bank and the new tower started in 2018, with the tower topping out in 2021.

SITE

Situated at the corner of DeKalb Ave and Flatbush Ave in Brooklyn, the building's site occupies much of the triangular city block bounded on all three sides with streets and avenues. The site is adjacent to other mixed-use developments, such as City Point, One Wiloughby Square, LIU Brooklyn, and Brooklyn Paramount Theater. Brooklyn Tower is also within several blocks of Brooklyn's former tallest buildings.

The site selection of this project can be learned from as the location of the Dime Savings Bank was optimal enough because of its **relation** to other mixed-use program, some of Brooklyn's previous tallest building's, and an area that seems to be fueled by **commerce** and **interaction**. Although there was already a building at this location, rather than tearing it down, Shop Architects decided to simply build above it. By using the **plinth and tower** concept - this time using an existing building as the plinth - the architects are able to get the optimal location without any disruption to the neighborhood at the street level. As real estate continues to dwindle in dense cities, this is an option that may very well benefit architects as years pass.

Source: Ben Dreith - Dezeen





View up from the Entrance to the Brooklyn Dime Savings Bank

Source: Shop Architects





View of the Entrance with the Brooklyn Dime Savings Bank Behind

Source: Shop Architects





FORM

The original bank building was built in the shape of a hexagon with chamfered corners at the north, southwest, and southeast. As a tribute to its base, the tower atop the bank **mimics** the shape of the original bank as it is also designed in a hexagonal shape, evoking the motif used in the bank's ground floor rotunda. At each of the six sides of the tower, the form agrees to slight **setbacks** as it grows, terminating to a crown at the top.

FACADE

The tower's exterior is clad in bronze, stone, and stainless steel, with hexagonal shafts interspersed throughout the facade as **vertical divisions**. According to Gregg Pasquarelli - principal at Shop, the design of the annexation between the tower was defined as both 'bad-ass, and quite elegant'. He was referring to the **continuity** of vertical elements of the facade from the original bank up into the tower and the blending of materiality from one building to another. The tower was intended to be 'deferential to the landmark, but not derivative'.

The base of the tower is clad in stone to **complement** the bank, and the facade of the tower gradually becomes darker as it rises - almost to say their connection is so strong at the base, that the crown of the tower is connected yet, its own entity. The spacing of the tower's vertical mullions compliments the distance between each of the bank's columns as they are extruded from the tower's glass curtain wall with sharp edges at certain locations, giving the impression of a three-dimensional facade in opposition of a flat glass curtain wall. Often seen as a contemporary Art Deco skyscraper, the Brooklyn Tower is described by Pasquarelli as 'the Empire State Building of Brooklyn'.

Source: Lucie Levine - 6SQFT





PROGRAM

The Brooklyn Tower will include approximately 120,000 sqft of commercial and **amenity** space covering one unit on the lower level and the first to fourth floors of the bank, with the first unit covering about 50,000 sqft, the second unit covering 30,000 sqft, and additional commercial office space on the third floor of the tower. There will also be commercial gyms located on the fourth floors of both the tower and the bank. The original banking room is still in tact, large in part due to restorations and renovations, which is home to the existing rotunda added in the bank's 1931 expansion.

The building's amenity spaces are located on the fifth and sixth floors which include outdoor terraces, three swimming pools, a cocktail bar and lounge, an indoor fitness center with a fourth swimming pool, a conference room, meeting room, dining room, kitchen, billiards room, and a movie theater for residents. The gym space alone covers 36,000 sqft and is placed below the first mechanical floors of the tower.

The tower's residential units consists of approximately 150 condominiums and 430 rental apartments spanning roughly 465,000 sqft of the tower's area with the condominiums placed more than 500ft above street level. With a mix of residential units and rental properties, 30% of Brooklyn Tower's total apartments were allocated to **affordable housing**, surpassing the 20% limit to acquire the state's 421-a tax exemption program in 2015 to encourage affordable housing. The affordable apartments consist largely of one-bedroom and studios while only 19 of the tower's affordable apartments have more than one bedroom. Each unit uses interior finishes that compliment the ones used on the tower's exterior, including marble, bronze, bronze, and stainless steel.

Source: Ben Dreith - Dezeen





View of the Tower from Bond St. & Warren St.

Source: Shop Architects





Bird's Eye view of the Tower as it stands over Brooklyn with Manhattan in the Distance

Source: Shop Architects







TAKEAWAYS FROM PRECEDENT STUDIES

Throughout these four precedent studies, there is a lot of overlap between the ideas behind these towers and thoughts from Banham and Koolhaas. They also provide further insight on other things to think about as we get closer to design. Below are some primary takeaways and points of inspiration from these studies

1 - The nod to its city's predecessors:

- Nodding to classic architecture through their masses and materials
- Respect the sites and buildings they are built on by mimicking their shape, facades, and materials,
- Paying homage to the heritage of their sites.

2 - The respect they have for their city's skylines and neighborhoods:

- How they resonate with nearby buildings and are (mostly) placed in areas with similar typologies nearby
- Matching the urban fabric of their neighborhoods
- Gracing the skyline rather than interrupting it
- Understanding the sense of belonging and responsibility they have as tall buildings and their affect on the skyline.

3 - The incorporation of diverse program throughout

- Incorporating common amenity spaces
- Creating spaces open to the public
- Creating spaces for all building occupants
- Designing for an adaptable, flexible, and evolving program
- Allowing space for affordable housing
- Re-imagining large-scale structures through their program





TAKEAWAYS FROM PRECEDENT STUDIES

4 - Creating a connection to nature and the human scale

- Design of aesthetics to relate to that of the human
- Creating places designed for human interaction
- Combining density with exposure
- Attracting natural light inward and views outward as much as possible
- Extruding the site upward and bringing its greenery and landscape with it

5 - Creating a landmark for the neighborhood

- Creation of a landmark within
- An opportunity to jump-start community, interaction, and economy
- Inclusion of a dynamic environment
- Allow the property to change with life and needs as they evolve

6 - The extrusion of the site below

- Extrude the site upwards to create a lower plinth
- Setback the plinth above and extrude upward to create tower
- Respect air rights and zoning setbacks - allowing the surroundings to shape the mass of the tower.

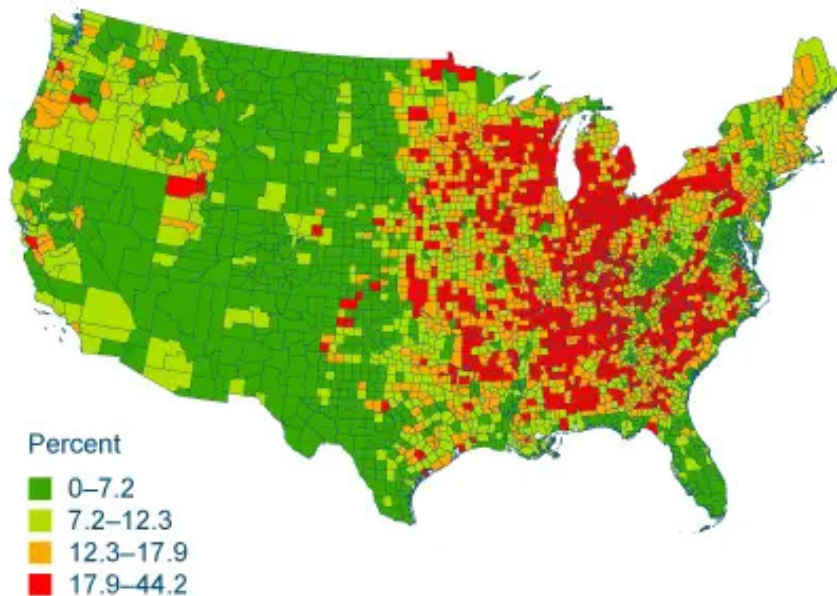




BRAINSTORMING A SITE

Now that a typology has been determined, it is time to focus on where in the United States would benefit most from a mixed-use super-tall that incorporates the ideas of megastructures within.

Adhering to some of my earlier ideas of adaptive reuse campuses being built on the sites that were once the heartbeat of America's industry, I do like the idea of finding a site of this nature somewhere in America. However, a decision must be made whether it be best to construct an edifice of this type in an area that is already full of buildings like these, or if this should be designed for an area that doesn't have any buildings of this nature yet.



Share of Manufacturing Employment throughout the US
Source: American Community Survey - 2012





THE WAY WE WERE

THE CHANGING GEOGRAPHY OF US MANUFACTURING FROM 1940 TO 2016



GEORGETOWN UNIVERSITY



Center
on Education
and the Workforce

McCourt School of Public Policy

Anthony P. Carnevale
Ban Cheah
Neil Ridley
Jeff Strohl
Kathryn Peltier Campbell

The Changing Geography of US Manufacturing from 1940-2016

Source: JP Morgan Chase & Co. - 2019





Rust Belt

[ˈrəst ˈbɛlt]

The geographic region from New York through the Midwest that was once dominated by manufacturing.

 Investopedia

Understanding the Rust Belt
Source: James Chen - Investopedia - 2024





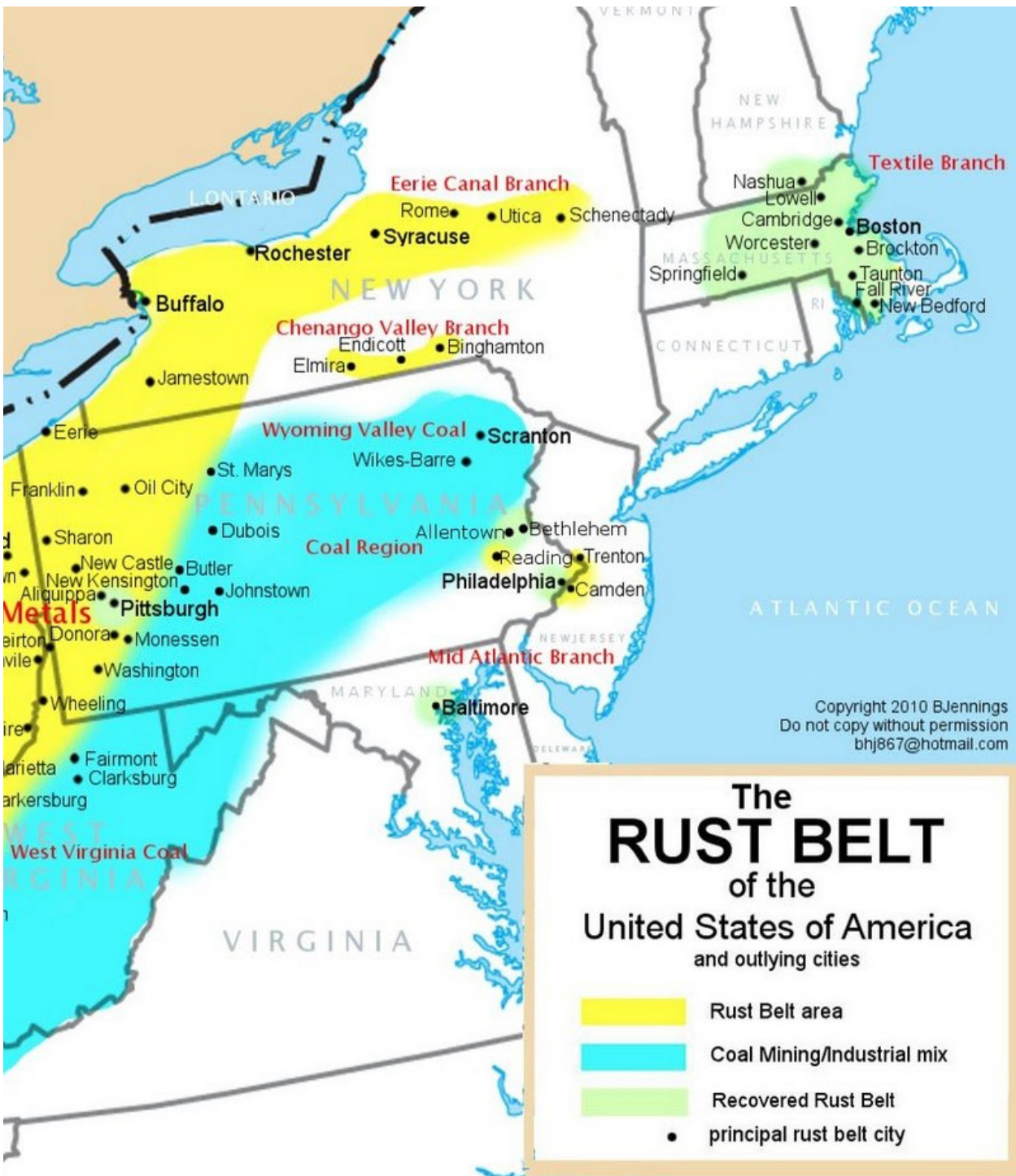
THE RUST BELT

The Rust Belt is a colloquial term used to describe the geographic region stretching from New York through the Midwest that was once dominated by the coal industry, steel production, and manufacturing. The Rust Belt became an industrial hub due to its proximity to the Great Lakes, canals, and rivers, which allowed companies to access raw materials and ship out finished products. The region received the name in the late 1970's, after a sharp decline in industrial work left many factories abandoned and desolate, causing increased rust from exposure to the elements.

Source: James Chen - Investopedia - 2024









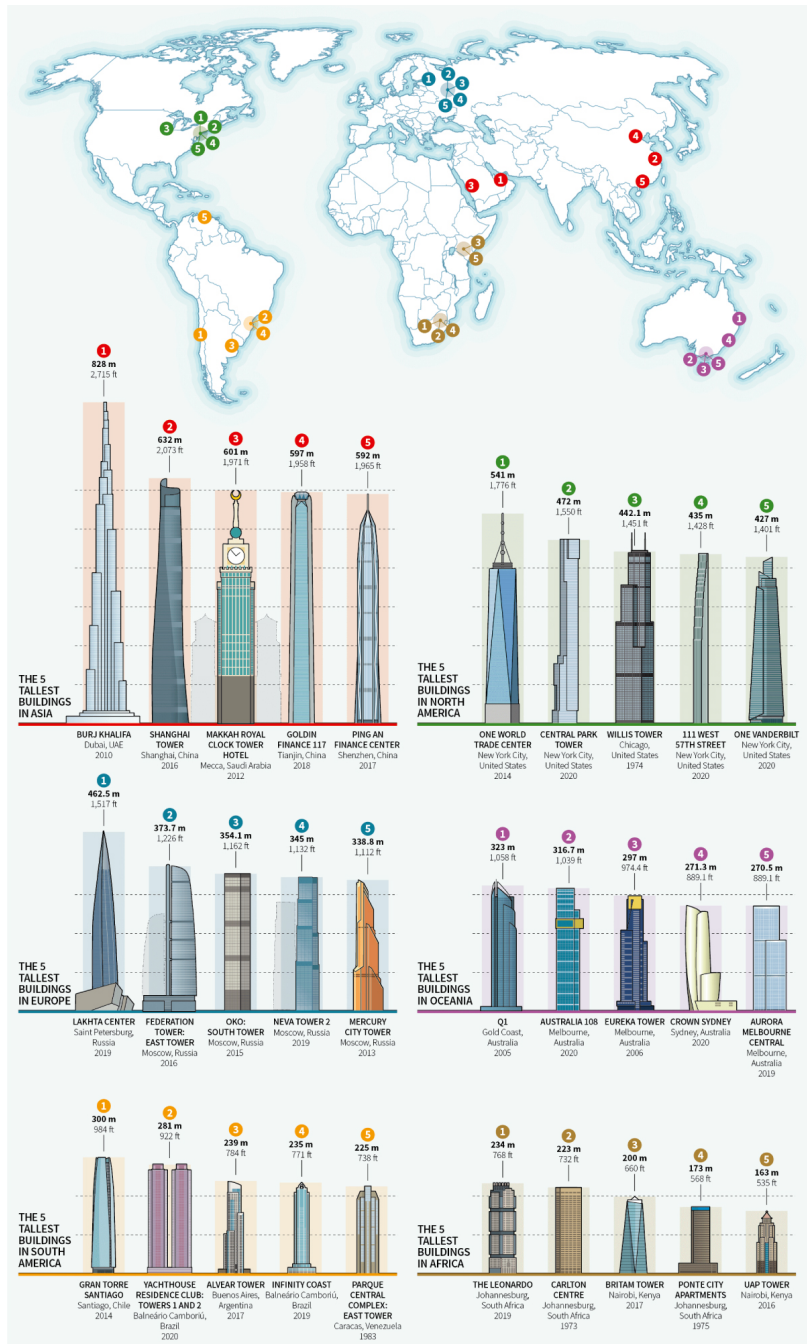
LOCATION OF NEIGHBORS

After understanding the location of America's past heartbeat of industry and the Rust Belt, we can narrow down a location to the Midwest and East Coast - the areas that encompass the largest industrial cities in America. Proximity of nearby supertalls becomes a factor at this point.

As I still ponder whether to design this tower in a neighborhood of supertalls or as one that stands independently, it is important to keep in mind that a tower's site of this typology will be the driving factor in setting up a program. If a site was chosen in New York or Chicago, the primary use groups would likely need to be allotted to office space and housing - sort of defeating the purpose of a diverse program.

At this point in time, I hold interest in a variety of different sites including the old dockyards and piers of Philadelphia, Pennsylvania, the harbor of Boston, Massachusetts, or the shores of Chicago, Illinois. Although not part of the Rust Belt, areas of the Midwest like Colorado and Kansas and more South like Oklahoma and Texas that have seen their fair share of an industrial foundation spark interest as well. Some of these states with less density than places like New York or Chicago provide for the opportunity of the views atop these buildings to be of snow-capped mountains rather than the urbanity of other cities.





Where Are the World's Tallest Buildings?

Source: Iman Ghosh - 2020





BRAINSTORMING A PROGRAM

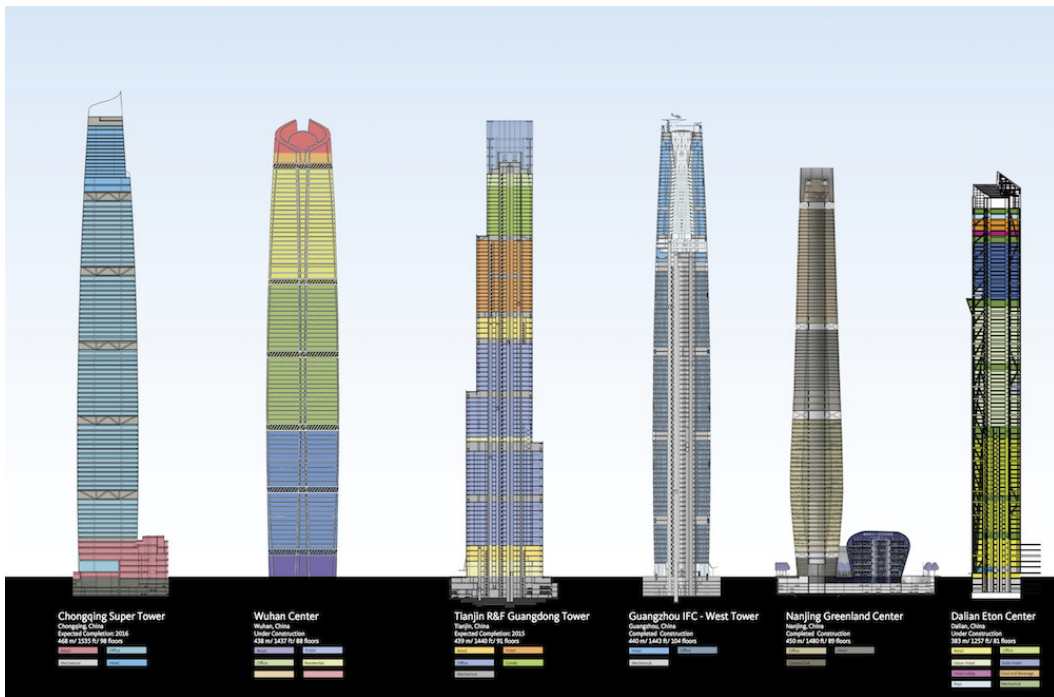
Although the selection of a site will most definitely influence the type of program that houses a mixed-use supertall, I think it's safe to assume that a basis skeletal system of program will be used. My initial ideas for program as follows:

Option 1 - A building that focuses primarily on a residential use over everything else but still encompasses a variety of spaces to offset the housing crisis (site dependant).

Option 2 - A building that doesn't have an 'anchor tenant' like a leasing company, but rather one that is solely meant for as much variety as possible. This would make more sense in a place like the Midwest where housing isn't as big of an issue as it is in New York.

- Apartments & Condos
- Affordable housing
- Office space
- Transient housing
- Fitness centers
- Dining establishments
- Medical facilities
- Civic spaces
- Theaters
- Concert Halls
- Recreational space (swimming pools, golf simulators, etc.)
- Underground parking
- Bike garage
- Transportation center
- Worship centers
- Markets and grocery stores
- Retail stores
- Educational spaces
- Outdoor spaces
- Tech centers i.e. innovation hubs
- Art studios or museums
- Public observation decks





Supertalls of China and their diverse programs

Source: Carrol Willis - 2024





FOR THE RESEARCH

- Understanding legal manipulation and FAR Legal of 14 to average of midtown

- Rise of developers and how they factor into supertalls

- Pride involved with building at ground zero vs. how long it took to lease out

- Where are the differences recognized in images from a pedestrian's perspective - scale

- **Conclude answers & desires**

- **Site research, demographics, and selection**

FOR THE DESIGN

- Idea of an ecosystem

- Lifespan of a building/site

- Hyper-dense communities

Fixed vs. malleable

Constant state of renewal

- Architecturalizing infrastructure

-Can we infrastructuralize an architecture?

-Cell towers, windmills, wif, telcom, renewable energy

-Preserving a building in time or just extending lifespan?

-Site driven approach



