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Verticle Treatise

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Vertical Treatise

Abstract

The evolution of this thesis revolves around the belief that in order to attract people of varying backgrounds to an urban high rise dwelling environment, units need to offer the amenities commonly found in suburban developments. The structures though must do more than just offer some superficial conditions; they must also integrate outdoor spaces that people often come to associate only with life in the suburbs. This thesis also looked at the reconnecting of an isolated site that was separated by elevated roadways and had little pedestrian traffic. Through the use of elevated bridges the site would be reconnected to the city on a pedestrian level which at the same time act as a conduit between buildings, as well as give a physical edge to the project. This thesis poses the question of 'how cities can fight the loss of residents to an idealized suburban life style.' Research into suburban building, and marketing trends, as well as common opinions and beliefs provided insight into the desires of the average suburbanite, and more importantly the things they saw as critically lacking in urban living.

Background

Can vertical living offer amenities that are commonly only found in a suburban environment? This thesis attempts to explore that question, by asking whether a high-rise development can offer these things and more to its residents, while maintaining its integrity in the urban environment. To do this though one must first understand the history and current situations within the suburbs of America.

Originally the suburban condition was not one that people desired. Originally named sub-urban for the areas that surrounded a cities walls, the squatters that lived there could not afford to move into the city, but still wanted to try and gain protection from it. Often times these shanty areas were lawless and often in times of siege the first areas to be cleared away. This meant that the original suburbanites were more of a transient population that could not often times afford the basic necessities of the times, but tried to subside while clinging to edges of cities for protection and anything that the city dwellers through away or overlooked. Today however, in America, it has become just the opposite, the cities are often times seen as the place where the people cannot escape to the better life in the suburbs. The cities suffer from lack of funding, a crumbling tax base, poor municipal facilities, and often times higher crime rates. The one thing most cities still have though is a central hold on jobs in the area, however now people can commute sometimes up to 2 hours one way each day

to get to their job, while they live in a suburban development faraway from the woes of the city.

The unique ability to use an automobile to travel to and from work has created a dire problem for every city. Now people expect bigger faster highways to get to a from a work that they continue to move farther away from in hopes of getting a new piece of the American dream. This dream though has been corrupted by politics and a rash of consumerism that fell victim to marketing, and an idealized dream that can never be achieved.

After the end of World War II and America witnessed the might of atomic weaponry it became abundantly clear that there cannot be a concentrated manufacturing base, or population base, because of the awesome destructive power of just one bomb. This change spurred highway growth and changes in legislation that made it feasible for families and businesses to move out of a central district and into the countryside. This along with marketing of what the new American dream of owning your own home and a new found freedom with a personal automobile created a great expansion. These people needed places to stay however, and when there is demand a market will find it. In this case it was the suburban developer. Originally suburban developments were not quick fix places with everything exactly the same, they were planned on the garden city beliefs, and treated with proper architectural integrity. However this was quickly perverted when it became obvious that a lot of money could be made on the part of the developer, whether he included the

amenities that originally attracted the people to the areas beyond the city. Now the suburbs were populated by people who bought into a belief that home ownership was the American dream, but they bought cheaply built homes, that were cookie cutter in design, where every neighbor's house was the same as yours, just that the plan had been flipped and a different color brick was used. This homogony can only be seen as a further degeneration in American thought, because of the lack of outrage over no truly individual features, but this complacency also created a common factor that separated the suburbs from the cities. Then during the Civil Rights Movement this difference became ingrained, when the primarily white middle class suburbanites could not fully grasp the desires of inner-city minorities who were left with the problems caused by a loss of tax base, as well as other very important issues.

However life went on in the suburbs, insulated from the problems facing many others. Then when race riots finally began to occur across the nation, it only furthered this white flight, which inevitably drove a rift between races for decades to come. Again the homogony within the suburbs only reinforced values and ideas people already knew and accepted, so when they were faced with different ideas and views that were contrary to everything they had known it immediately became a dividing point, and it grew increasingly difficult to relate to events outside of the suburban realm. Cities then became dangerous realms where it was only safe to travel to during daylight hours, which was only reinforced by sensationalized news stories that further prevented most suburbanites from wanting to go to the city.

Finally the nail in the urban coffin was set, with the development of the shopping mall, completely suburban in its influence, you drive to a large parking lot with all of the stores you could possibly want, and wander aimlessly (safely) without having to deal with, or see any signs of urban decay. This one piece of development took the last thing the city had away from it, the one thing people needed to return there for, to buy specialty items that only larger retailers would have. Now those retailers came to the customers, thus ending the need to go to the city for the suburban dweller.

Once a lack of need to go to the city was achieved, then a transformation of what was important became apparent in suburban design, with larger and larger houses on smaller lots with attached garages. The represented the ultimate suburban ideals, you go to your garage that is attached to your house, drive in your, park in an enclosed lot, and then work in a building, completely insulated from the outside world. This isolation only furthers fears and misunderstandings, breaking down communication between the urban and suburban dweller, and ultimately between suburban dweller and suburban dweller, because every becomes so isolated they do not even know neighbors.

These are the things that this thesis attempts to bridge, not only giving outdoor play spaces and large well lit residences, but creating the chances for interaction, and a broadening of understanding between people. This thesis also recognizes that not everyone will move to and urban condition even if all of their desires for space

and outdoor facilities are met, but it is an attempt to curb the ideas of those who think that suburbia is the only place to find these conditions.

The Site

The blocks to the northwest of the central business district of Philadelphia, are an area that is not completely connected to the rest of the city. Although there is a lot of housing in this area, it lacks the amenities that are common throughout the rest of the city where there is similar population density. One of the main reasons for this is the absence of an ease of accessibility to the area. At the southern edge of this district running parallel to each other is John F. Kennedy Boulevard, and subway tracks that rise out of the ground to cross the river. These two act as a barrier that limits the ability for people to easily come from the central district into the neighborhood, which has limited the growth of any businesses in the area. To the North of the area is I-76, which though it is cut into the ground, still acts as a border that is not easily crossed to get into north Philadelphia. The western edge is the Schuylkill River, and to the east the site is bordered by a museum district. Because of these two borders, currently there are only a few restaurants and one dry cleaner in the area.

Although this area has had a steady population, it has not grown with the city. It is one of the only areas within the central city that still has vacant land, and is the only area that a whole city block is available to build on. When talking to some of the residents in the area, they commented that they did like the living there, but were bothered that to do any grocery shopping, or go have a nice coffee you had to go 8

blocks or more. The other thing that was complained about frequently was the fact that the area seemed to close down as soon as night fell and the museums closed. The area to, although along the river didn't actually have access to the river walk, a park along the river for walking, jogging, and riding your bike. To get to the get to the river walk you had to either north almost to the expressway, or two blocks south of JFK to then get too it.

To first connect the site back with the city, a pedestrian greenway will be constructed that runs between JFK and the subway bridge, before turning north into the site. This greenway will allow people to walk easily from the centre city into the site, while allowing the people in the area to use it as access across the rail tracks and onto the river walk. With this the area becomes a conduit, increasing the flow of traffic, and the demand for more amenities. This would also keep the area "alive" for longer than just the museum hours. The shopping that will put in the area will also increase the amount of people coming in, especially with a grocery store, not only would the immediate residents benefit, but some of the surrounding area's residents would have less of a strain to get basic necessities. The site being located only one block away from a mass transit stop would allow any specialty stores to flourish with people coming from all over the city.

Defining Edge

Although it is easy on a map to find cities and districts, with the spreading of population today to actually see were something starts and stops can become impossible. This blurring has become problematic for some cities were their edge

cities can become more powerful economically, and because of more ample housing they draw residents away from centre cities. With this spread come traffic problems for commuters, more city spending on maintaining roads, and a lack of contact between people in the city itself. Instead of an easily definable area where the city is it becomes a metropolitan area, where high rises eventually fade to single family homes and the shopping and entertainment that used to be centrally located has now spread throughout a region.

Edges are important because when a city starts to become blurred it can lose the things that make it unique from the surrounding areas. An edge can act as a beacon to those who are new to the area drawing them to the place, it also helps give people a feeling of enclosure, that an area has a certain set of properties that can be understood and followed. Edges can be natural or man made, natural edges though can easily be bridged with today's developments, so often times it is man made structures that create the edges that cities have. These constructed edges usually serve as visual keys that define the area both physically and figuratively.

In the case of this thesis the proposed site is along a natural edge, which has been overtaken, with the city sprawling to the west. With this and other developments that are currently underway, the river will again become a defining point of the city, but buildings will reinforce this. This edge is important because the city really does not continue across the river, it transforms from a business area with permanent residents throughout, to a college campus dotted with intuitional buildings and students, who are not there for a third of the year. It is not that this area is

somehow lesser; it is just wholly different, which is very obvious once you cross from one to the other. This edge only helps to enforce that visually.

This thesis not only looks at demarcating areas, but also reconnecting forgotten portions of a city. Often times through random planning errors that seemed to work initially, areas can be cut off and forgotten at the pedestrian level. Connecting these areas can be difficult because often times there are multiple reasons as to why a site has become disconnected. This disconnection usually causes problems, often times the rate of growth within the site is slower than the city's, businesses have harder times, and the site is often not as active as the rest of the city.

Through reconnection at the pedestrian level a site that is surrounded by activity can become active itself. With some stores to attract people, it can soon become a route one goes through, instead of around to get to other areas. To do this though, the site has to be pedestrian oriented, if people only drive through an area, then the area itself does not benefit.

The site in Philadelphia is one of these disconnected sites. It has very little pedestrian traffic, almost no businesses to speak of, and only a few restaurants. Although the area is densely populated with row houses that are in nice condition, there are no amenities for the residents of the area. That coupled with the fact that the area seems to close up with nightfall has made it of little interest for people in the rest of the city.

The site though, is in a great location, right near the river and a large park, museums only a few blocks away, and nice homes it should be a site that easily draws people in. The simplest act is a connection to the river walk, this would cross over train tracks, but with other connections back to the city it should not be an issue. The harder issue is coming from the main street to the south of the site, both it and subway tracks are elevated there to bridge over the river, with no way to get down to the district. With a pedestrian walkway coming down it could connect the center city with the site and the river walk, while also giving a definable border to the southern edge of the site. These connections though would only be initial steps the area too needs destinations and things that may be unique to it, that also benefit the residents, this way it gives back to the people who are already there, but becomes a destination for people in the rest of the city.

With urban housing being the main structure of this thesis it has to be understood as more than just apartments or lofts. Urban housing has for the last 30+ years faced competition with suburban developments. Often times these developments are seen as better because of privacy issues, size of the living area, and surprisingly yards. The first two issues can be integrated easily with design and building standards, but using proper sound insulation and larger, roomier places, but the last is a rather unique problem for the city. Yards somehow have come to represent part of the American dream, but more importantly it seems that people see them as places where your child can play without a parent having to worry. In a city you have to take them down and out of the building, walk them to a park, sit around

while they play, and make sure to keep an eye on them. While one of the draws to the suburbs is that they just open up the door and they are in the backyard, and you as a parent can worry less. The yard is also seen as a place to sit out on and relax to forget your worries. What is to say though that every unit within a high-rise complex cannot have a yard too, one that you can walk out on and is of decent size? They could even be integrated into natural systems on the building as a way of dealing with rainwater runoff.

The largest thing that living in an urban environment has as an advantage is proximity. This coupled with public transportation allows cities to have an advantage over suburban developments, because of the lack of a commute to work. With ever rising gas prices and the now realization that there is not an endless supply of petroleum, it seems only logical that people will once again have to return to metropolitan centres for residences that are within a reasonable distance to their jobs. This becomes a response to green building initiatives, but ones that are forced to work within an urban context. The project will weave throughout the design green bridges that will span between the housing spaces creating a sense of community, and bringing a variety of views and spaces to residents that would otherwise just live in "boxes" devoid of outdoor activities just outside of their doors. The units will also incorporate larger out door spaces on every floor that can act as a "yard" to be used by the residents as a private area. In addition the tops of the buildings will also be utilized as park places with varying activities ranging from green planted areas to hard scaped courts, all the while taking advantage of the views to the surrounding areas.

Since the development is a response to natural shortages, it will implement the latest in "green" technologies, as well as using pre-industrial design techniques to take advantage of its surrounding environment. Shading becomes an important aspect to keeping buildings cool during the summer months, however rather than just using surface as a shading device, the use of photovoltaic panels will be used helping to generate electricity for the building. Since the building is also located on the Schuylkill River, the buildings will capture the cool breezes the travel down it to lessen the cooling load. Limiting the number of units per floor give more floor plan flexibility, and let units have multiple opportunities for natural light, lessening the use of electricity during the daylight hours.

Elephant & Castle

Areas of Tower #1:
Total gross area: **276,304 sq.ft.**
Total nett area: **232,095 sq.ft.**
Total area of plantation:
44,209 sq.ft.

Areas of Towers #2&3:
Total gross area: **95,765 sq.ft.**
Total nett area: **79,485 sq.ft.**
Total area of plantation:
16,280 sq.ft.

Nos. of Storeys:
Tower #1 - 35 storeys
Tower #2&3 - 12 storeys

Date Start:
2000 (Design)
Completion Date: -

Client:
Southwark Regeneration

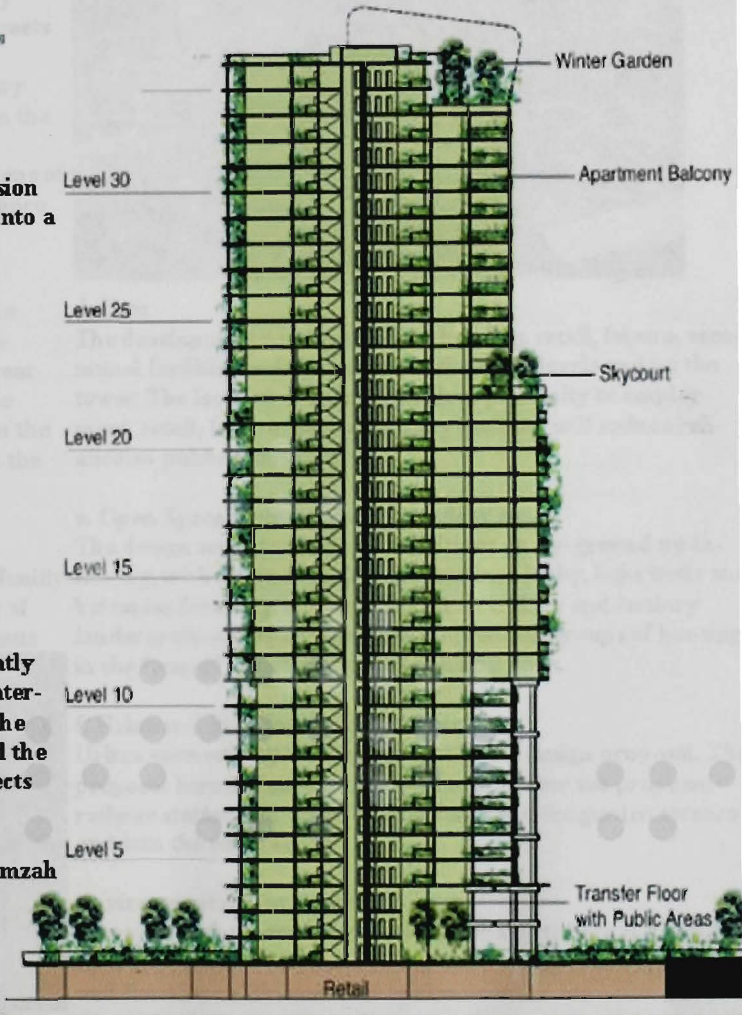
The Elephant & Castle development encompasses a vision to transform over 180 acres in South Central London into a scheme which will provide:

The project ecological features are as follows:

- **Over 1 million sq.ft. shopping and leisure**
- **3,500 new homes for sale**
- **Over 1,100 new social homes**
- **New public transport interchange**
- **500,000 sq.ft. of offices**
- **One hotel**
- **800,000 sq.ft. key worker accommodation**
- **New community facilities**
- **Three major parks (one of 15 acres)**

Design Features:
The Elephant and Castle regeneration project was jointly designed by a number of consultants. A new railway interchange divides the site into two. The left hand side of the railway track was developed by Foster & Partners and the right hand side by TR Hamzah & Yeang, HTA Architects and Benoy Limited.

Benoy Limited designed the retail spaces while TR Hamzah & Yeang designed the towers with HTA Architects.



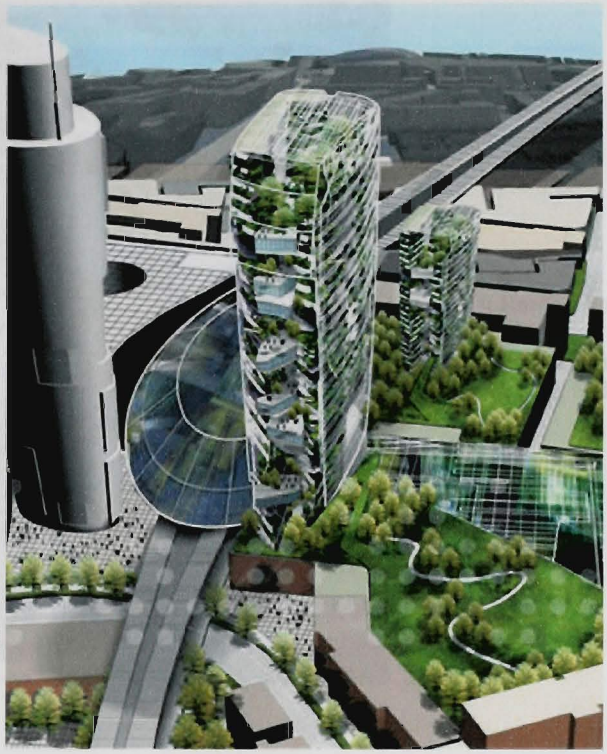
Social Sustainability

a. Concept - "City-in-the-Sky".

The design takes the model of a general geographical area of a city, with its inherent systems, zoning and social infrastructure and inverts it into skyscraper buildings.

The skyscraper and its retail and commercial base is seen as a microcosm of the city, containing within itself the inherent elements of a city block, i.e. parks, shops, entertainment centers, community facilities and housing etc. The "City-in-the Sky" concept provides for:

• opportunities for local employment through mixture of use, both on ground and upper levels
• A healthy mix of residents within the same building. Through "vertical zoning", resident types are grouped according to accommodation preferences (single units, family units, luxury apartments), yet common facilities (e.g. parks, shopping streets etc.) are shared.
• close proximity to basic amenities, such as the local grocery store, postal boxes, chemist etc. These are all located within the ground development and/or within the tower.
• a healthy landscaped environment, with spatial progressions of public open spaces (parks in the sky) to semi-private (entrance courts) to private open spaces (balconies).



b. Orientation

The towers make the most of a southerly aspect to catch the winter sun. The views of the city to the north are also maximised. The internal void and walkways capture the sun, creating a series of light wells to brighten the service areas in the apartments. The wings of the building allow cool breezes in the summer to enter the central atrium while shielding it from the winter wind.

c. Users

Mixture of residents from different ages, occupations and family structures are accommodated by the provision of a variety of accommodation types: studio apartments, 2-room apartments

d. Uses

The development will incorporate housing, retail, leisure, communal facilities and commerce on the retail levels and up the tower. The location of housing in close proximity to employment, retail, leisure and community facilities will reduce reliance on public transport.

e. Open Space Requirements / Outdoor space

The design seeks to re-create conditions on the ground up-in-the-sky, with features such as an entrance lobby, light wells and balconies for every unit and shared secondary and tertiary landscaped open spaces and sky pods within groups of housing in the form of sky courts and communal pods.

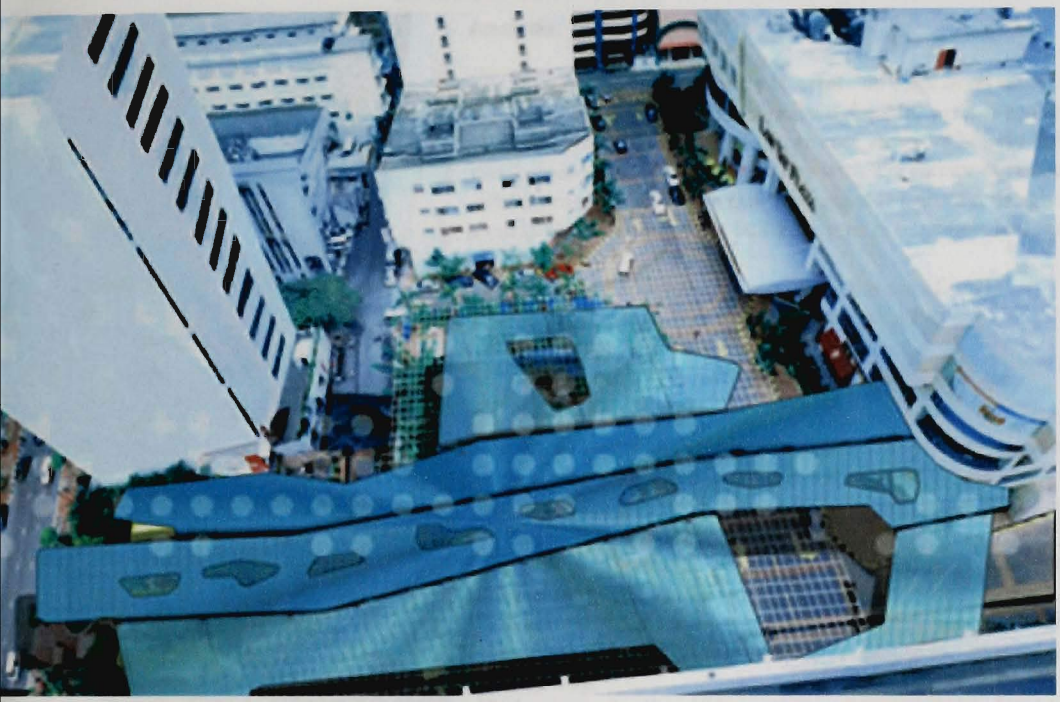
f. Relationship to Immediate Context

Urban connectivity is a key concept in the design proposal. The proposal here includes a high level bridge over the proposed railway station and direct connections onto the garden terrace and into the retail zones.

Environmental Sustainability

The approach to environmental sustainability here is a holistic approach i.e. it takes into account the entirety of the systems and functions of the ambient environment.

BB Park Roof Canopy



Project Name:
BB Park Roof Canopy
Location:
Bukit Bintang Precinct, Kuala Lumpur, Malaysia
Date Start: -
Areas:
1080 sq.m.(covered plaza)
Owner:
Low Yat Group
Nos. of storeys:
2 storeys
Completion Date: -
Site Area:
2,608 sq.m.

Design Features:

The project consist of a huge semi-enclosed canopy (1,080 sq.m.) covering a public plaza, that will contribute towards "place-making" in the city of Kuala Lumpur. The plaza will contain a number of F&B outlets and public multi-use spaces that shall become a destination for local and overseas tourists to enjoy the local cuisine , tropical environment and culture of Malaysia. It is also a place for the public to aggregate.

The large canopy has secondary layers or "leaves" of roofing which are overlapped to permit cross-ventilation. "Mixed-mode" bioclimatic devices such as overhead fans and demister fans are used to improve conditions of comfort and to keep users below cool. At night, super-bright lights may be used to give the effect of turning night-into-day making the place a 24- hour space.

The structural steel columns support the roof and the multi-media screens below. The place will be unique and one of its kind found anywhere in the world.

BB Park Roof Canopy

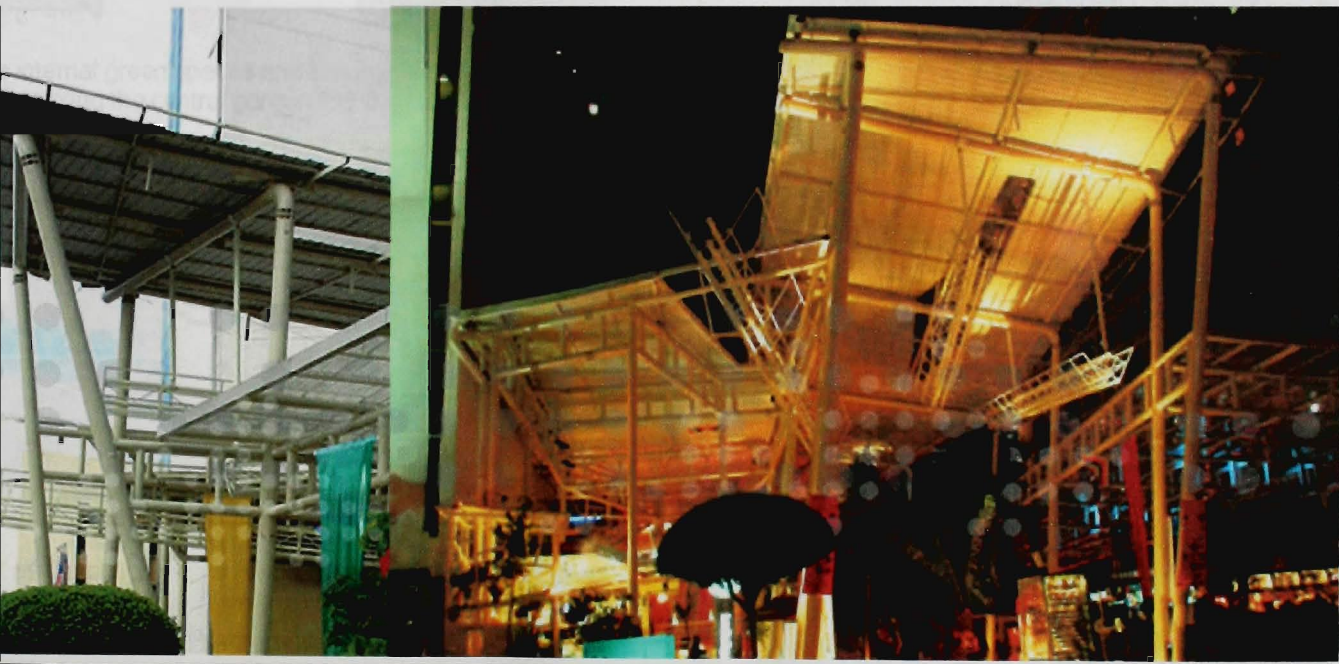
Analysis:

BB. Park represents the ability to create an edge in an urban environment. Not only that but to create space that is easily definable, yet it is not walled off from the city and its inhabitants, in BB Park the large roof structure clearly defines the area. The space also becomes a melting pot of users with a diversity of restaurants and shops, as well as entertainment spaces. If a multiuse space is part of a design and it an important element in the function of the building, then it must take lessons from this space.

- Create a distinct area/district without the use of walls
- Allow it to be inclusive to all residents of a city
- Allow the space to be active 24/7
- Create diversity within the programming of that space

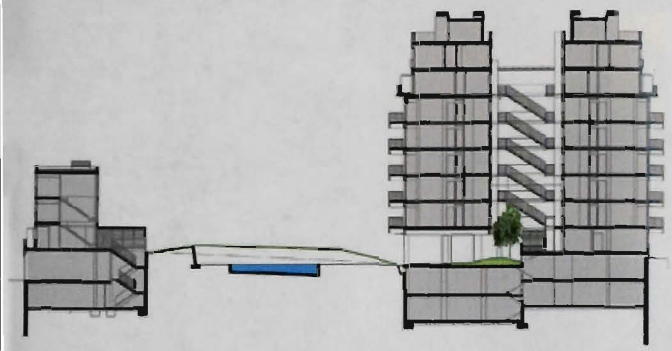
Summary of features:

- The roof as a "tropical umbrella", encloses the spaces below for multi-use activities giving partial protection from external weather conditions.
- The umbrella also provides a covered pedestrian thoroughfare from Jalan Bukit Bintang to Low Yat Plaza at the rear.
- The umbrella serves as a focus for the community. The umbrella's height gives it added prominence as a landmark structure in the precinct.
- The umbrella has a multi-layered overlapping roof form. Ventilation louvres and openable sliding roof panels enables cooling of the spaces below the roof, preventing heat build-up.
- Under the umbrella will be various mixed-mode bioclimatic devices to keep the users cool such as the use of demister fans. Water features and landscaping further improves the comfort level of the users.

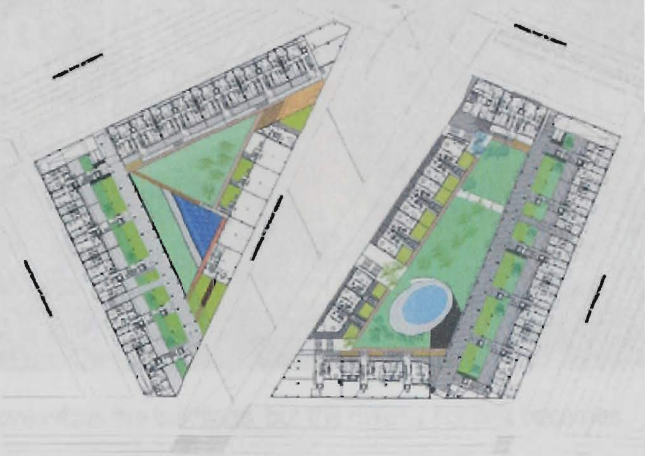


La Maquinista Housing

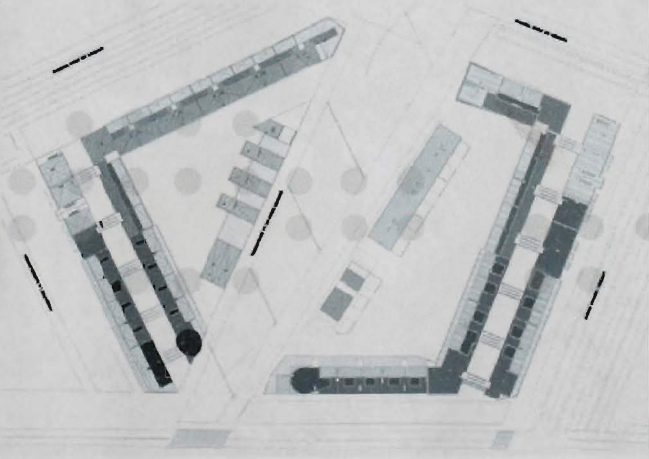
This series of 500 housing units in Barcelona took an approach to city block planning where by the housing units would be separate physically, yet linked by design style and an inner courtyard. The courtyard was approached as a void space, which became a garden that structured the centre of the complex by providing entrance to the houses thereby, linking the vertical void of the patio with the horizontal void of the general entrance porch. Vegetation is found throughout the buildings and courtyard, creating a more livable urban environment



The internal green spaces and the exposed vertical paths help to bring the central garden into the building themselves.



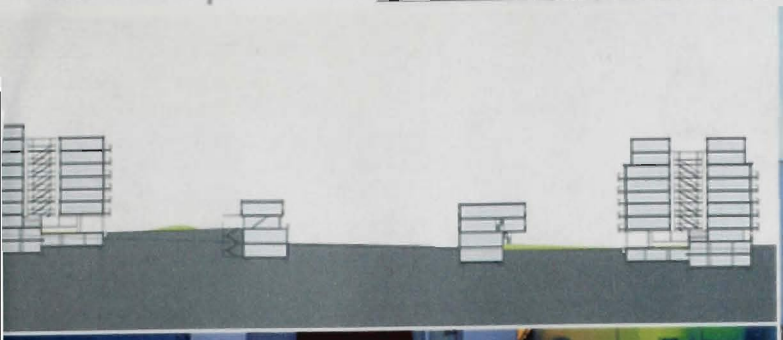
Just as the buildings are layers of housing and green spaces the materials used in detailing the buildings is also layered, lending to the total design.



Map Arquitectos

Barcelona Spain 1998-2002

La Maquinista Housing



The creation of the inner courtyard, helped to create a sense of community for the residents in this project. Also the ability to pull the green space from the centre courtyard into the building themselves helped to give a sense of ownership to the residents, this coupled with the naturally lit stairwells and circulation halls help to further blur the outside and the inside.

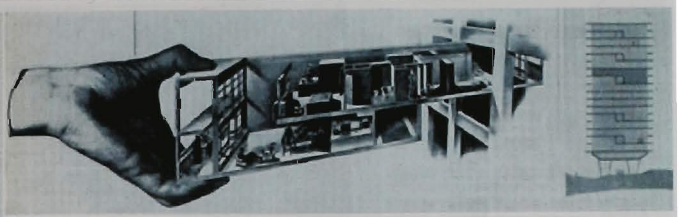
The vertical circulation becomes more appearant as you move within the buildings, but the natural lighting becomes as important an element too.

Map Arquitectos

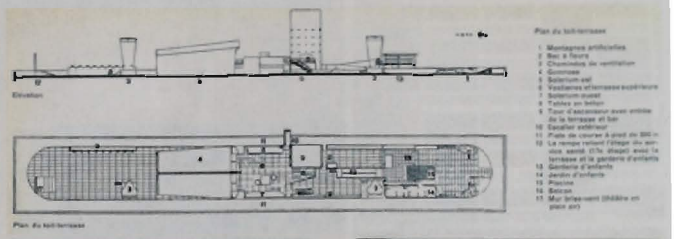
Barcelona, Spain 1998-2002

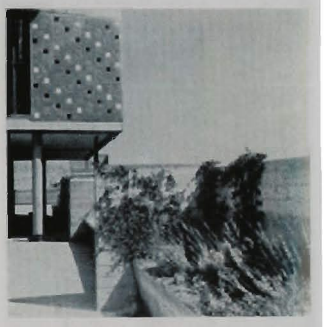
Unitè d' Habitation

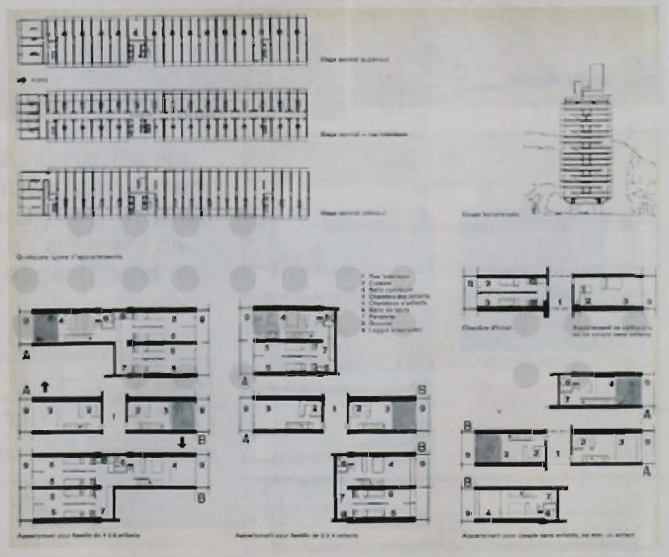
The Unite d'Habitation formed the basis of numerous housing developments designed by Le Corbusier throughout Europe. Originally built to alleviate a severe postwar housing shortage in France, the Marseille building comprises of 337 apartments housing 1600 people, arranged over twelve stories, all suspended on large pilotis. The pilotis allowed the residents of the building to salvage the ground area that the building normally would have occupied. The building incorporates shops, sporting, medical and educational facilities, and a hotel. The flat roof is designed as a communal terrace with sculptural ventilation stacks and a swimming pool. Although planned the mid-level shopping never really flourished, perhaps because of the difficulty for non-residents to get to the street, or the isolation of the Unite itself. Through ingenious planning, twenty-three different apartment configurations were provided to accommodate single persons and families as large as ten, nearly all with double-height living rooms and the deep balconies that form the major external feature. This flexibility in choosing living environments is one of the reasons the Unite d'Habitation is today experiencing an influx of new occupants.



Although the program of the building is elaborate, structurally it is simple: a rectilinear ferroconcrete grid, into which are slotted pre-cast individual apartment units, like 'bottles into a wine rack' as Le Corbusier put it.



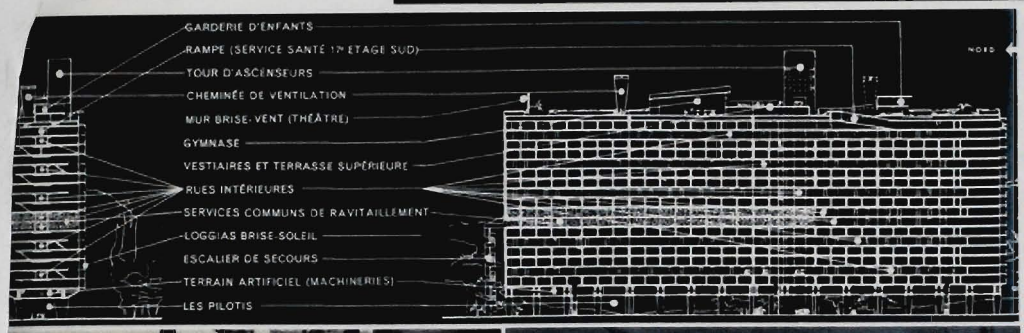


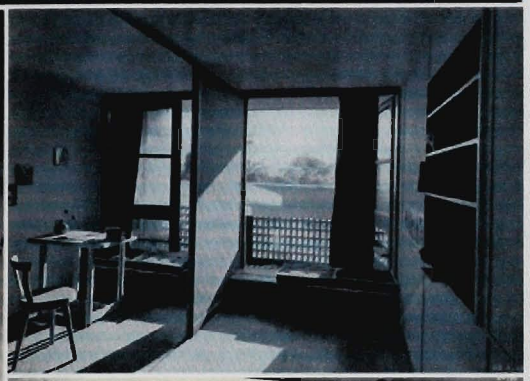


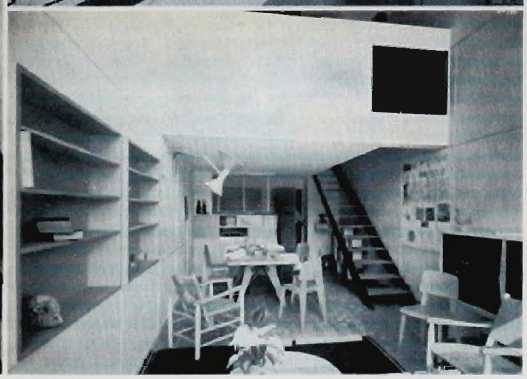
Le Corbusier

Marseille, France 1947-1952

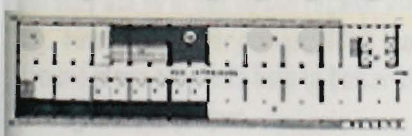
Unitè d' Habitation

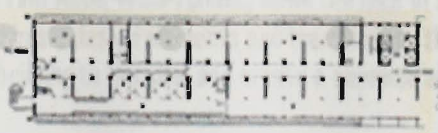


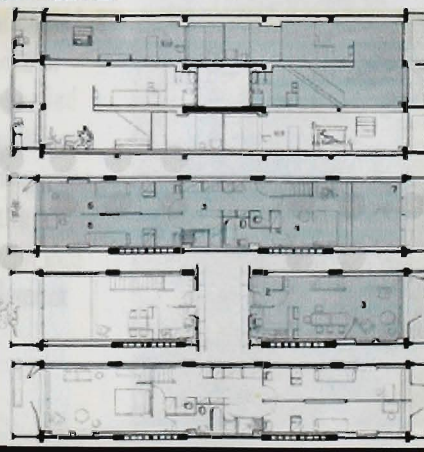




Although the apartments may be narrow compared to today's standards, the emphasis on natural light cannot be ignored. Its ability to make smaller spaces seem more open is vital to many smaller designs, and the interior balcony over looking a two story sitting space gives those rooms a much larger feel. Le Corbusier's design of a hallway every third floor also helps to provide a more efficient flow of residents.



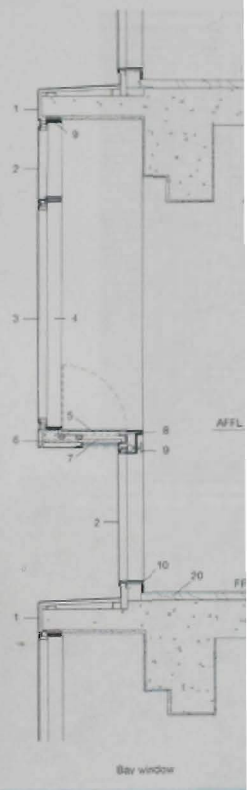




Le Corbusier

Marseille, France 1947-1952

1 Moulmein Rise



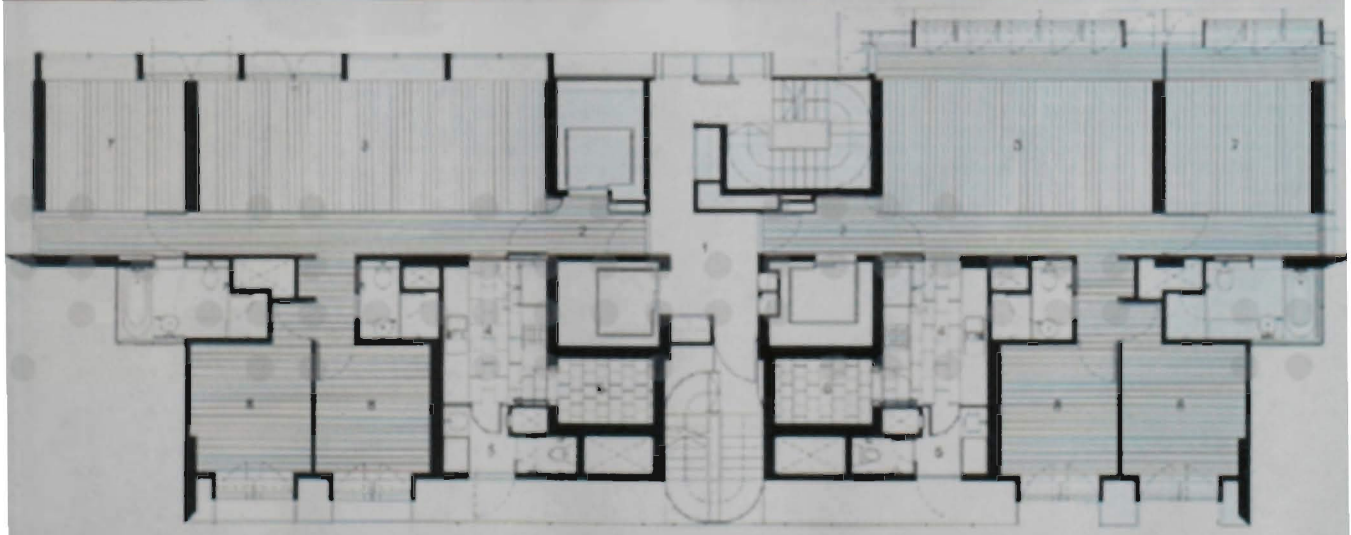
No. 1 Moulmein Rise is a project that attempts to balance the complexities of an urban high rise building, is it an object in the city's skyline, or does it respond to the users' desires for creating comfortable environments? They began by first developing a simple apartment layout that allowed maximum light into the units, and views of the city from within. From there, they began developing a façade that was simple in its element, but complex in appearance. The façade also had to respond to environmental conditions, easing the mechanical demand on the building, and allowing passive systems to be used if desired. The first of these was the development of a "monsoon" window that is similar to a bay window, but with an opening in the horizontal surface that could be controlled by the resident to allow air into the unit, with out it getting wet during the monsoon season. Additionally a screen system was used on the north façade to keep the building shaded year round, while still allowing some light in. Also in response to lighting and shade an additional system of ledges were created, that not only acted as a place for individual air conditioning units, but they act to break up the façade, and keep rain water from running down the face of the building. Finally with their design, **WOHA** took their basic design elements and transformed them into ground plane elements help to better tie the building to the site, and create a common element throughout the project.

WOHA Architects

Singapore, Singapore 2003

1 Moulmein Rise

High-rise apartments in Singapore show the delicate balance of how housing towers take an appealing overall form yet still focus on the users needs within the building and units themselves. This balance can only arise by designing the units/plans in conjunction with the tower elevations and overall form, to be sure the two interact clearly and respond and inform each other.



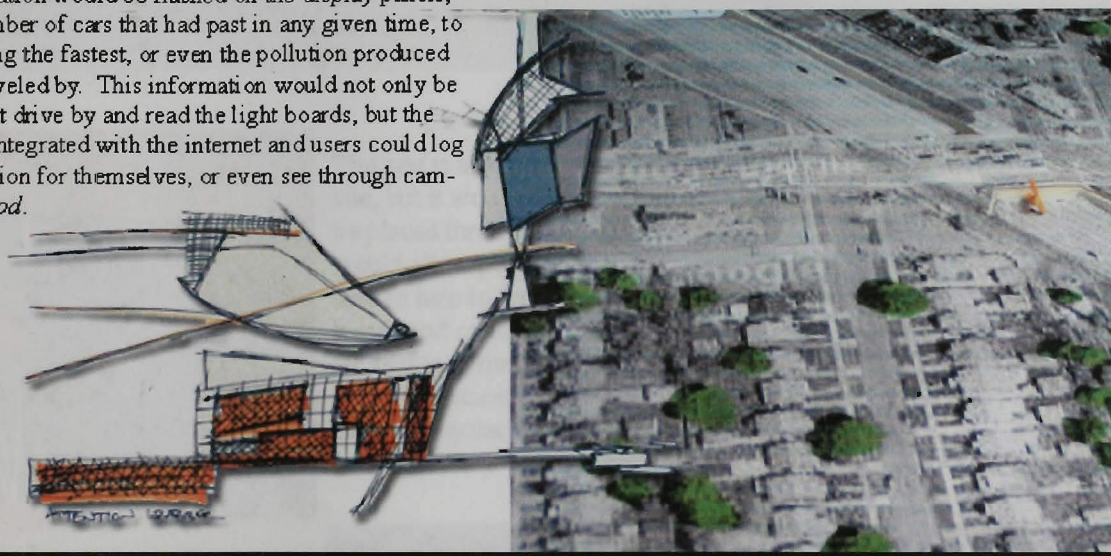
WOHA Architects

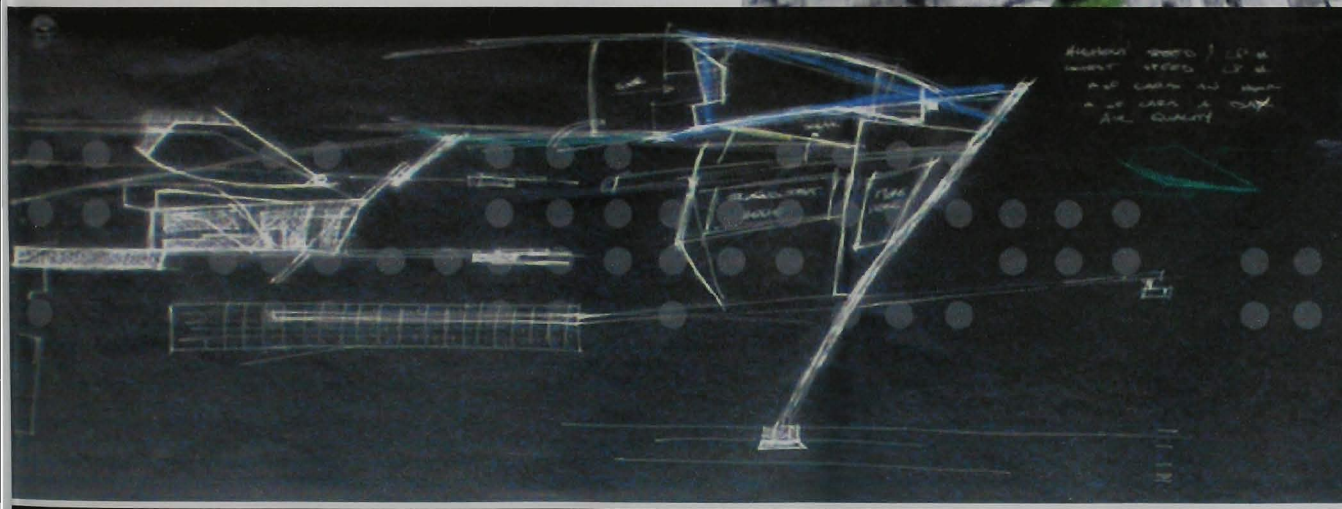
Singapore, Singapore 2003

Sketch Problem

In this sketch problem I was giving the parameters to live for one 24 hour period on the "Jersey Barrier" at the centre of the Lodge Freeway at the 7 Mile overpass. Because of the speed of the cars traveling along the freeway my first instinct was to go vertically where there could be relative safety for any occupant, as well as making sure the cars on the freeway still have their perceived amount of space.

Another aspect of the sketch problem was to collect information/artifacts from the site while we "inhabited" the space. Again I realized early on that no one was going to be running around on the freeway in the night grabbing up trash or shredded tires so I began to think of digital information. This *pod* that was created would be only occupied periodically to make sure everything is running ok, but it would be fully automated so that everyday random bits of information would be flashed on the display panels, anything form the number of cars that had past in any given time, to the car that past it going the fastest, or even the pollution produced by the cars as they traveled by. This information would not only be accessible to those that drive by and read the light boards, but the pod would be totally integrated with the internet and users could log on to see any information for themselves, or even see through cameras mounted on the *pod*.

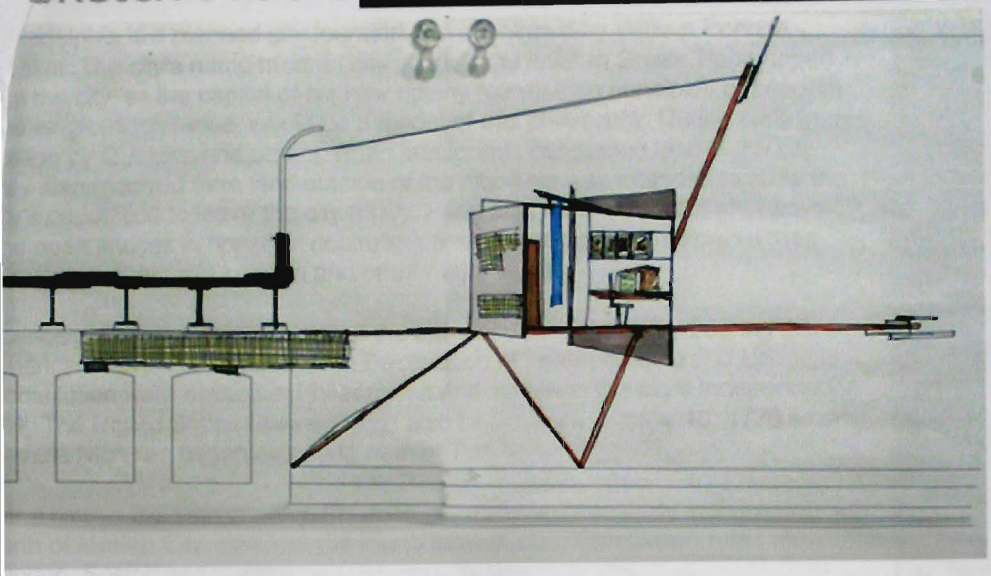


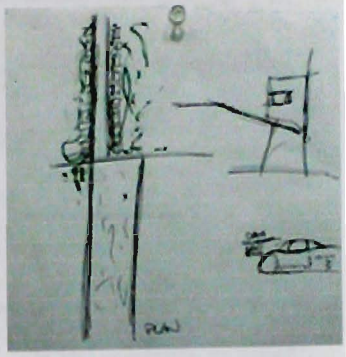


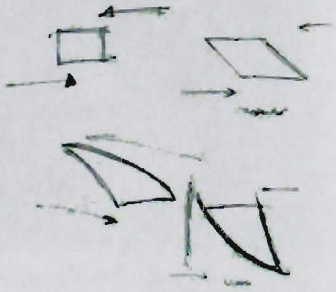
Data Collector/Transmitter

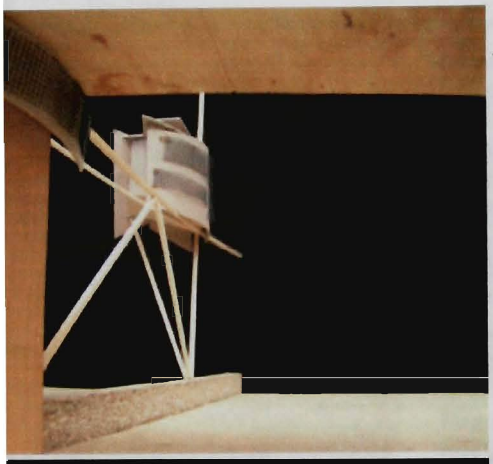
7 mile overpass on the Lodge Freeway

Sketch Problem

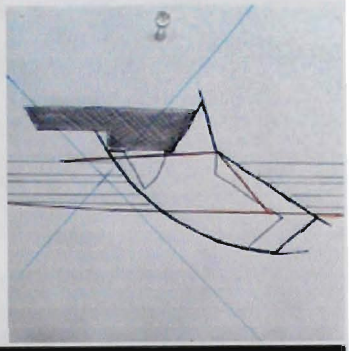


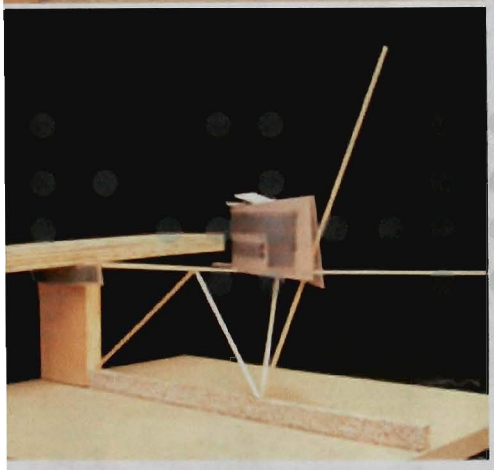


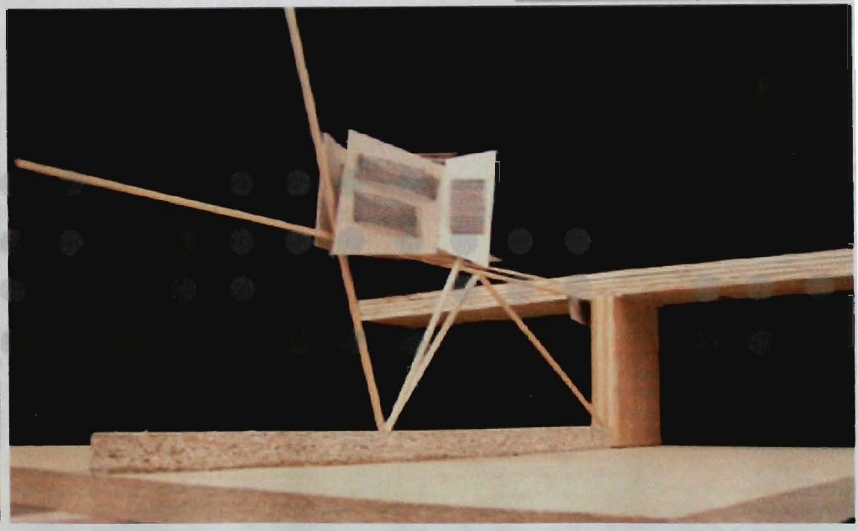




The *pod* is also not limited to this specific site, but it would be hoped that they could be placed throughout the country, which would allow people to study the compiled data to help to further distinguish traffic trends and conditions. Thus leading to better adapted driving conditions as well as better monitored "choke points" withing the interstate systems across the country.







Data Collector/Transmitter

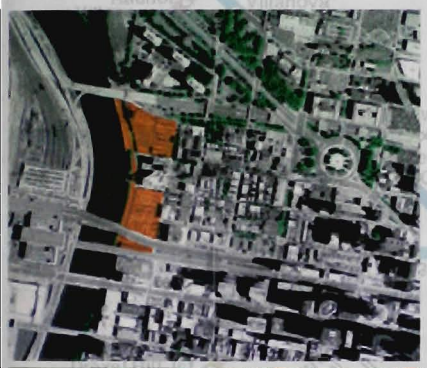
7 mile overpass on the Lodge Freeway

Site Analysis

Philadelphia is a planned city founded and developed by William Penn, a Quaker. The city's name means "city of brotherly love" in Greek. Penn hoped that the city, as the capital of his new colony founded on principles of freedom and religious tolerance, would be a model of this philosophy. During early immigration by Quakers and others, when immigrants purchased land in the city, they also received farm land outside of the city. This was intended to allow the city's population to leave the city easily. Penn also required lots of alleyways and open spaces in hopes of controlling fires and disease, which were then common problems in London and other major cities.

Philadelphia was a major center of the independence movement during the American Revolutionary War. The Declaration of Independence and US Constitution were drafted in Philadelphia and signed in the city's Independence Hall. The United States Marine Corps also began here on Nov. 10, 1775 when Samuel Nicholas began recruiting men at Tun Tavern.

For a time in the 18th century, Philadelphia was the largest city in the Americas north of Mexico City, and was the fourth largest city under Crown rule (after London, Bristol, and Dublin).

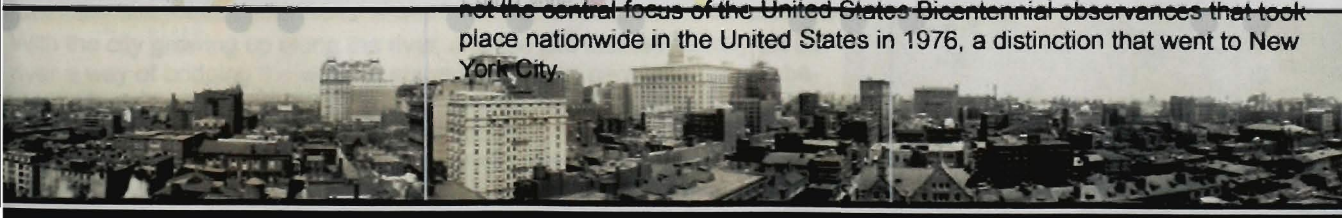


In 1790, as the result of a compromise between a number of Southern congressmen and Alexander Hamilton, then serving as Secretary of the Treasury, the seat of the United States Government was temporarily moved from Federal Hall in New York to Congress Hall in Philadelphia before taking its current residence in Washington, DC. In exchange for locating a permanent capital on the banks of the Potomac River, the congressmen agreed to support Hamilton's financial proposals. Philadelphia served as the temporary capital for a decade, until 1800, when the Capitol building in the new Federal city of Washington, DC was opened.

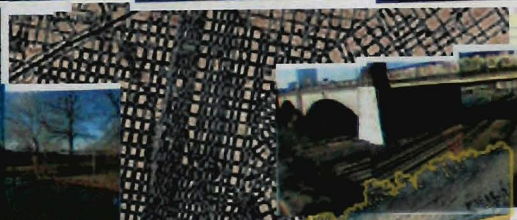
An early railroad center, Philadelphia was the original home of the Baldwin Locomotive Works, the world's largest builder of steam locomotives, which eventually relocated to nearby Eddystone, Pennsylvania). The Pennsylvania Railroad, once America's largest railroad by revenue and traffic volume and at one time the largest public corporation in the world, was headquartered on Broad Street, as was its merger successor, the Penn Central, and in turn its freight railroad successor, Conrail.

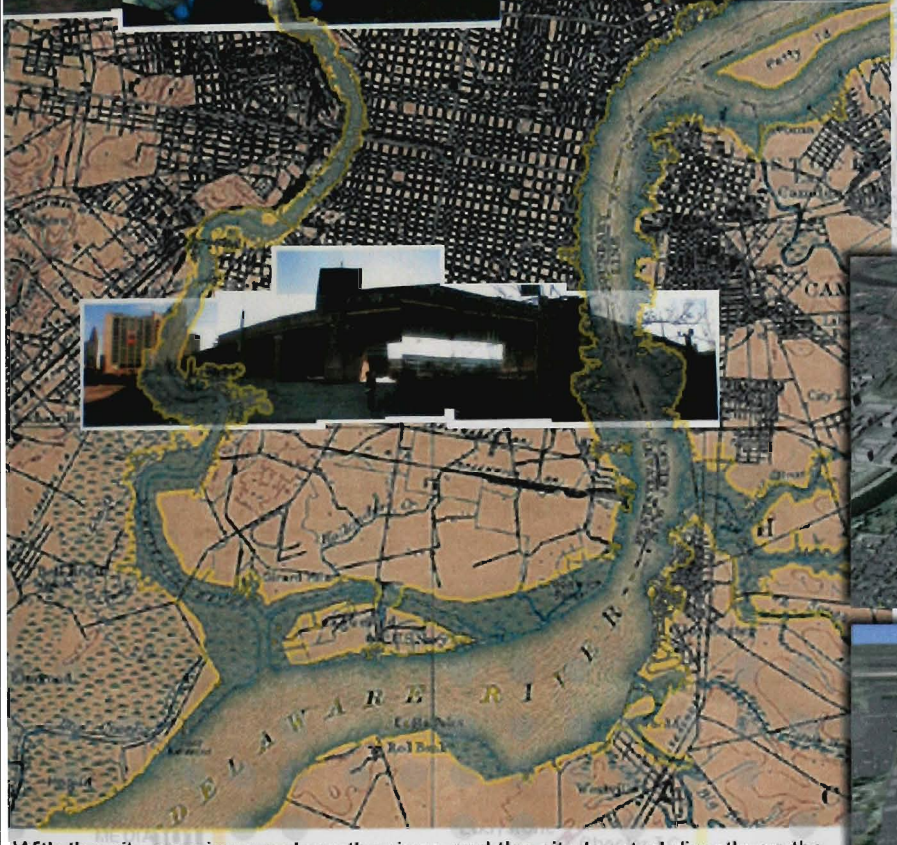
In 1876 Philadelphia hosted the World's Fair, known as the Centennial Exposition. Memorial Hall and the expansive mall in front of it are remnants of this fair.

In 1926, the city held the Sesquicentennial Exposition, but Philadelphia was not the central focus of the United States Bicentennial observances that took place nationwide in the United States in 1976, a distinction that went to New York City.

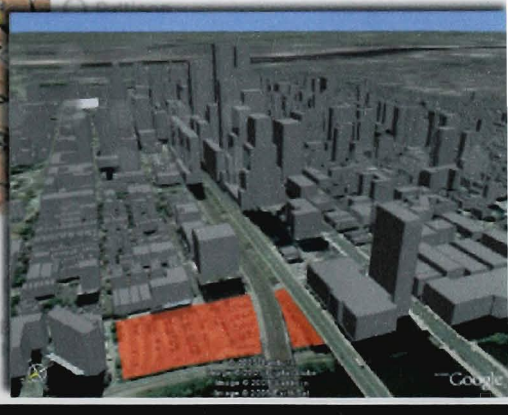


Site Analysis





Bridges become a major boundary for the site, however because of their layering and height that offer unique oppurtunies for architectural exploration, and development of pedestrian thuroughfares which can act as links to the sight, and the existing riverwalk areas.



With the city growing up along the river, and the site located directly on the river a way of bridging the waterfrontage back to the people of the city becomes important. Also within the project, if this natural boundary is exagerated by a physical form, it pays homage to a past boundary of the city, this time though demarcating the limits of the CBD, and other highrise developments.

Project Program

Project Identification

The idea for this program is to create an area of urban density of approximately 500 housing units, but also to create within the site a set of mixed use structures that will correspond with the needs of the people within the area, not just those in the new structures. The arrangement of spaces will consist of a street frontage responding to the surrounding area with retail and commercial spaces of one to two stories, while the towers will be beyond them, creating a vertical edge to the development. The purpose of the commercial spaces is to prevent the residential towers from over powering the area, but give a gradual rise from the street and bringing the adjacent area's residents into the site to shop and interact in the park spaces that are created. Within the towers there will be an emphasis on light and movement, through the use of large glass facades and kalwall the building will give an appearance of floating rings of concrete. Outdoor spaces will be used by the residents as gathering spaces, circulation spaces, and play areas that help to connect the residents socially, as well as giving the building a defined aesthetic. The project development will also focus on connecting this section of the city back to the main thoroughfares of pedestrian traffic, as well as the river-walk through the use of elevated greenways and further connections to the park behind the commercial development. The structures too will give a sense of vitality and create a more vibrant diverse neighborhood within the immediate area.

Articulation of Intent

- Create outdoor spaces for residents to interact in
- Create density within an urban environment
- Allow a mixing of residents with different cultural and economic backgrounds
- Develop a form that questions the standards of vertical living
- Reconnect a lost neighborhood to the city
- Allow a variety of options in the units to create spaces that appeal to differing needs

This thesis's intent is not to create just another high-rise apartment block, but to question the forms and limitations that traditional high-rise living has perceived as unavoidable. This would include providing the resources available that people see as advantages to moving to the suburbs rather than staying in a city. This thesis seeks to create this "vertical suburb" with amenities that make life comfortable and convenient, while not making it a space that functions independently of the city it finds itself in.

Enumeration of Actions

Learn – Grow as a person **[comfort] [play] [family] [organize] [grow] [live]**
-Bright
-Inviting
-Open
-Interesting
-Diverse

Comfort – House becomes a Home **[play] [family] [organize]**
-Privacy
-Quiet
-Warmth
-Pleasant
-Dim

Play – Enjoy Life **[comfort] [organize]**
-Outdoors
-Loud
-Open
-Bright
-Green
-Large

Live – Engage in all realms of life **[comfort] [play] [family] [organize] [grow] [learn]**
-Density
-Bright
-Ease
-Proximity
-Energy
-Open

Family – Foster ties within your group/unit **[comfort] [organize] [grow]**
-Security
-Privacy
-Seclusion

Organize – Reinforce the community **[family] [live] [grow] [comfort]**
-Open
-Inviting
-Connection
-Bright
-Security

Grow – Maturation of the individual **[comfort] [play] [family] [organize] [learn] [live]**
-Open
-Safety
-Comfort
-Interaction
-Bright
-Interesting
-Green
-Density

Work – Creating income within the community **[live] [grow] [comfort] [learn]**
-Bright
-Interaction
-Interesting
-Contact
-Inviting

Community – Building relationships between residents beyond the family **[organize] [comfort] [grow]**
-Bright
-Inviting
-Open
-Large
-Security
-Proximity

Quantitative Program Summary

Site
N. 23rd St. and JFK Blvd
Philadelphia, PA
385506 ft2 = 8.85 acres

Note:
43 560 ft2 = 1 acre

Retail [40,000 ft2 total]
- *2 restaurants*
  - *5000 ft2 each*
- *1 Grocery Store*
  - *25000 ft2 each*
- *2 galleries*
  - *2500 ft2 each*

Commercial [170,000 ft2 total]
- *2 offices*
  - *15,000 ft2 each*
- *1 Fabric Store*
  - *40,000 ft2*
- *1 Exercise Facility*
  - *100,000 ft2*

Dwelling [490 units] [852,000 ft2 total]
- *1 bedroom unit [100 units total]*
  - *1000 ft2 [100,000 ft2]*
- *2 bedroom dwelling [160 units total]*
  - *1550 ft2 [248,000 ft2]*
- *3 bedroom dwelling [150 units total]*
  - *-2000 ft2 [300,000 ft2]*
- *-4 bedroom dwelling [80 units total]*
  - *2550 ft2 [204,000 ft2]*

Exterior Spaces [275,000 ft2 total]
- *10 large outdoor green spaces*
  - *15,000 ft2 [150,000 ft2]*
- *10 small outdoor play spaces*
  - *7,5000 ft2 [75,000 ft2]*
- *5 outdoor hardscape spaces*
  - *10,000 ft2 [50,000 ft2]*

10% mechanical = 85,200 ft2 per tower
20% circulation = 170,000 ft2 per tower

PROGRAM TOTAL SQUARE FOOTAGE: 2,613,000 ft2

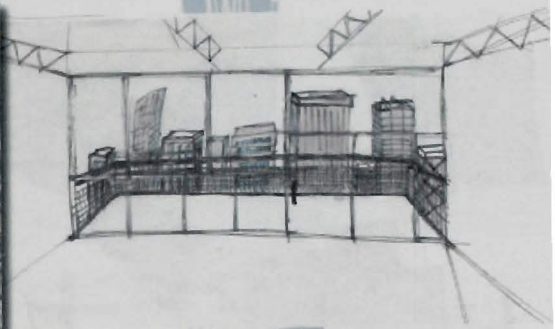
Parking
- *1 space per housing unit*
- *500 spots*
- *1.5 spaces per 1000 ft2 of commercial space*
- *257 spots*
- *retail parking on street*

General Conditions

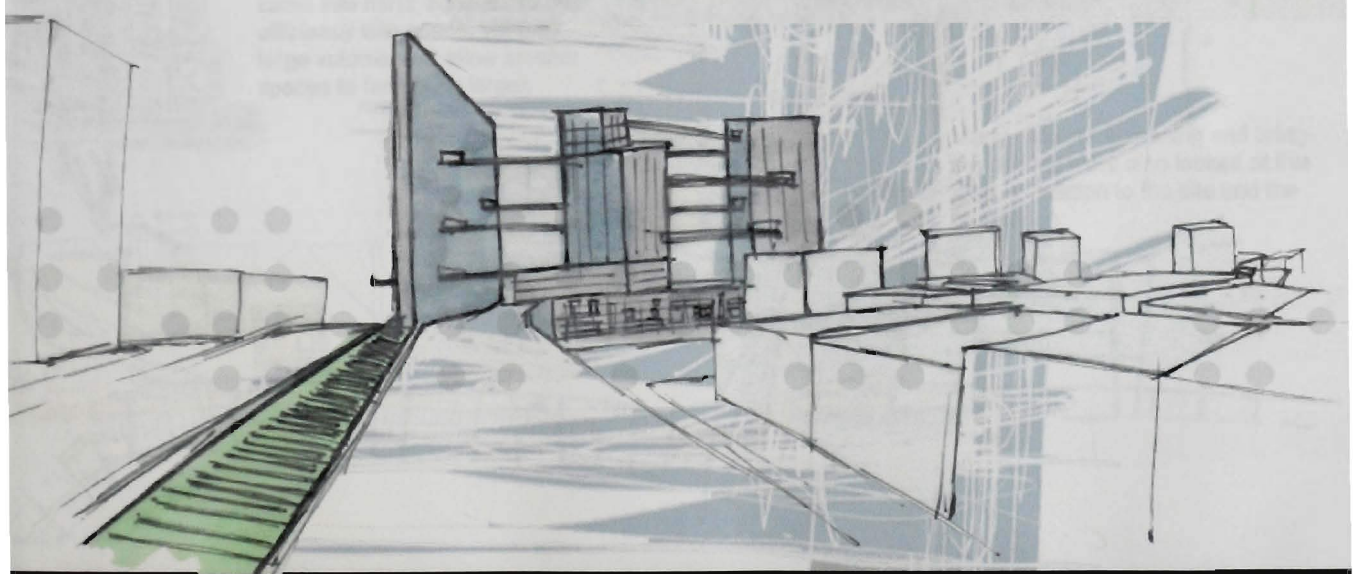
All residential units will take advantage of day-lighting with 2 story living room spaces, which will maximize the sunlight coming into the units. Also along the window wall will be a "monsoon window" which will allow fresh air to enter the units regardless of their height off of the ground, or any adverse weather conditions. Another unique feature within the units is a double layer of Kalwall that faces the circulation spaces of the building. These walls act as a privacy barrier, an area that hides structure, a vertical chase, and as a reminder for your neighbors and their movements within their own units. However this shadow play is not at the expense of anyone's privacy, which if anyone should choose to hide their movements, the space between the two Kalwall layers will be lit, which when turned on, both side will merely glow giving privacy to the inside and creating a glowing wall for the rest of the building. The units themselves are designed with this shadow play in mind, and the floor plans are laid out to allow large amounts of sunlight to reach the Kalwall uninterrupted but dividing walls thus taking full advantage of the possible effects.

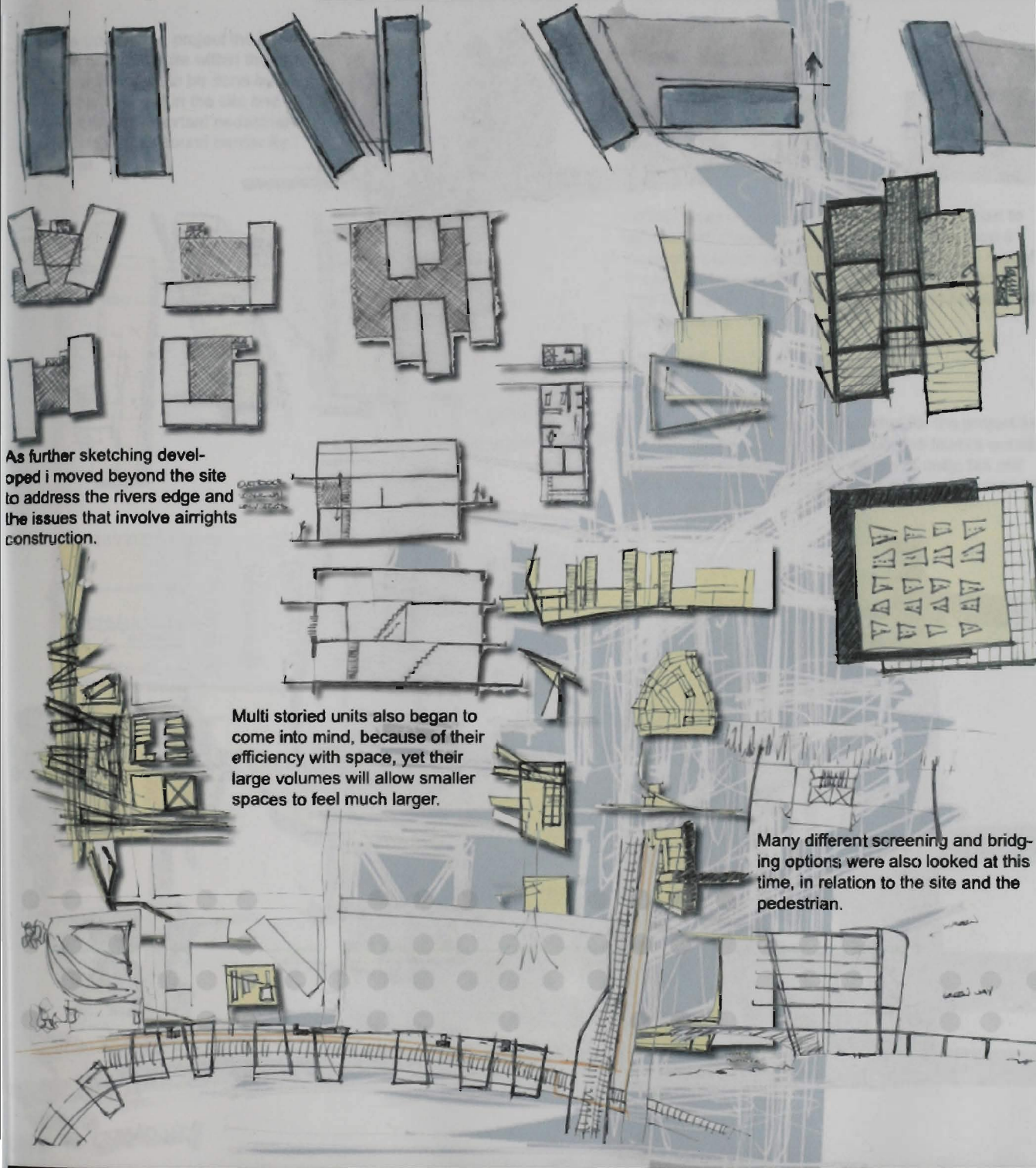
Another common feature throughout the design is the second floor mezzanine which becomes the master suite for every unit. This upper floor contains at a minimum a large walk in closet, bedroom, and full bath, and often times an office/nursery and other sitting spaces. These multi leveled spaces also allow for unique interactions from floor to floor as well as taking advantage of the views out over the family room without taking away from the air 2 story feeling within the units.

Design Process



In initial developments of the project I only began looking at the site as a singlular entity, but still how this one place could connect back to major areas throughout the city itself. The other theme that is readily appearant is the idea of elevated bridges and outdoor spaces that help to connect the towers both physically, and socially, ideally these outdoor spaces would be places of interaction and entertainment.





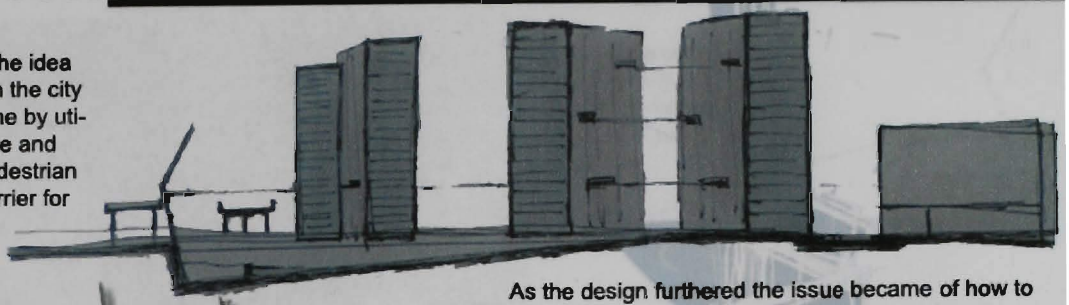
As further sketching developed i moved beyond the site to address the rivers edge and the issues that involve airrights construction.

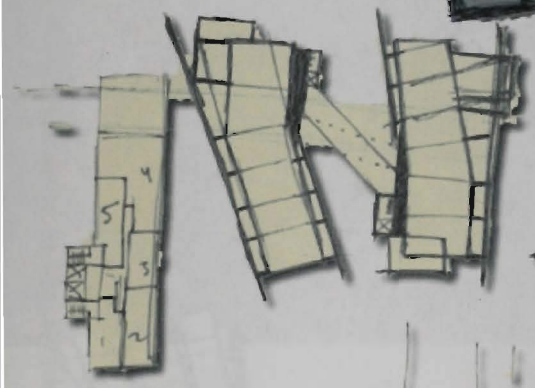
Multi storied units also began to come into mind, because of their efficiency with space, yet their large volumes will allow smaller spaces to feel much larger.

Many different screening and bridging options were also looked at this time, in relation to the site and the pedestrian.

Design Process

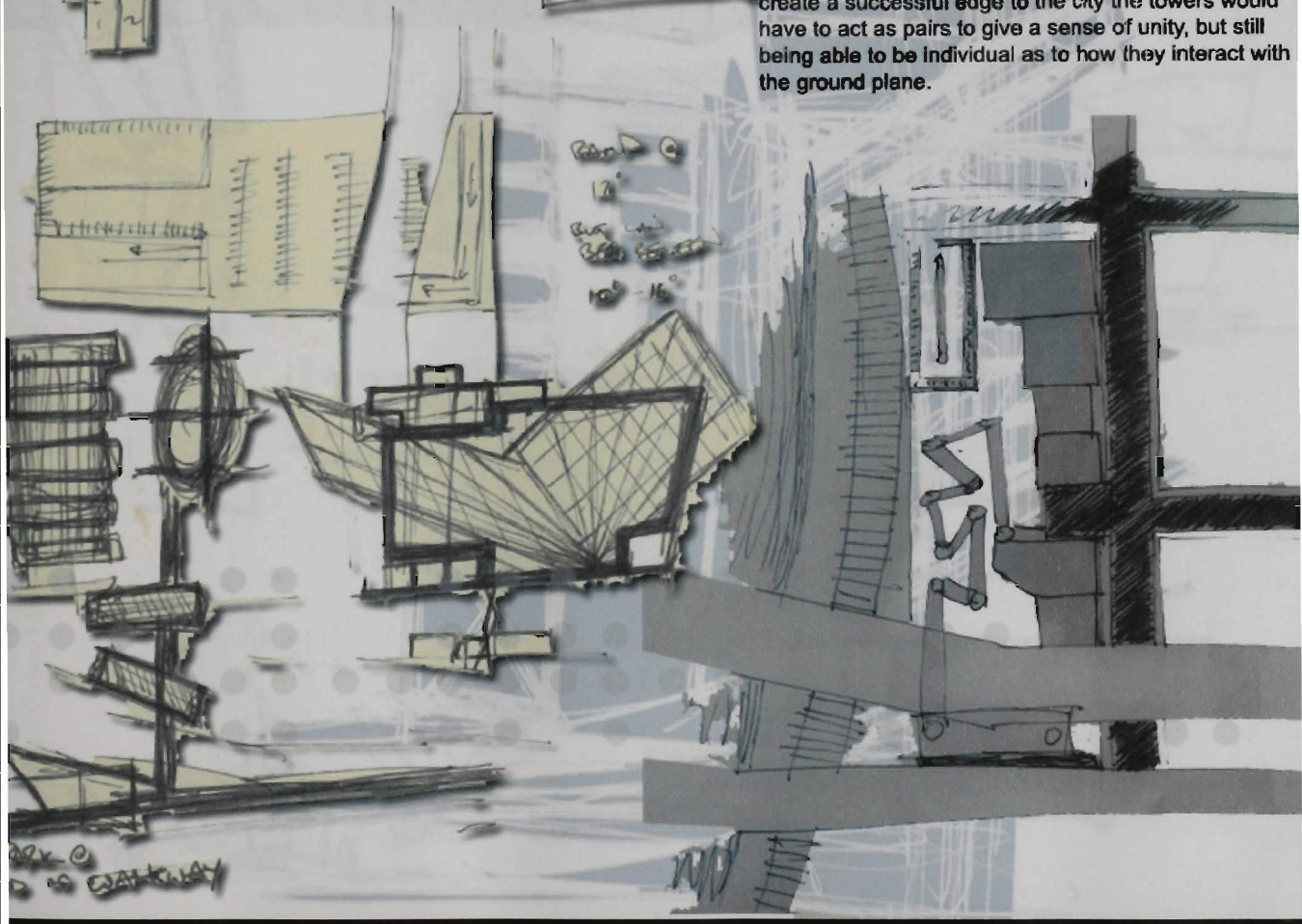
At this point in the project the idea was to brand the site within the city which was hoped to be done by utilizing the "wedge" in the site and using it as an important pedestrian piece, as well as sound barrier for the area

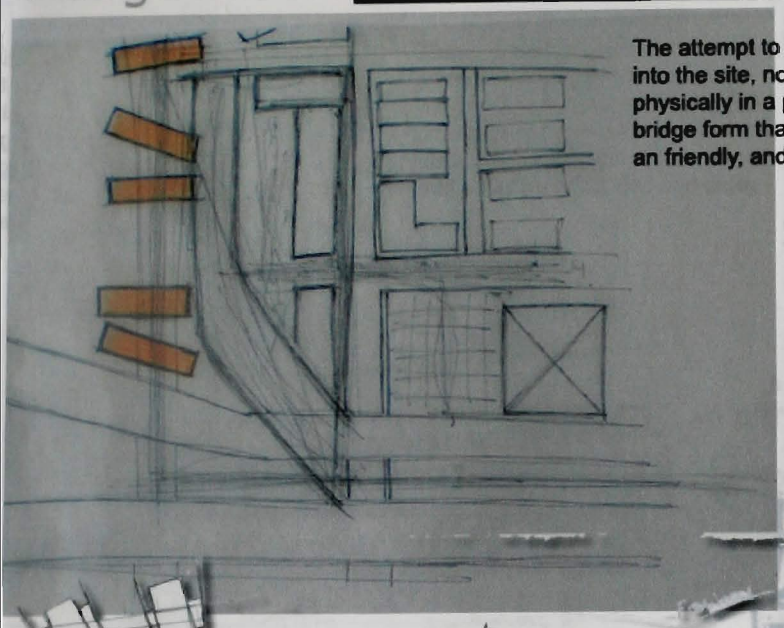




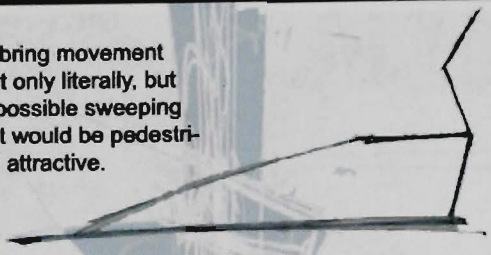
As the design furthered the issue became of how to address the riverfront, yet at the same time keep a pedestrian connection to the riverfront and the rest of the city. A connecting factor also was how to bridge over the existing train tracks to reconnect the site with the river front.

By now it had become apparent that for the project to create a successful edge to the city the towers would have to act as pairs to give a sense of unity, but still being able to be individual as to how they interact with the ground plane.

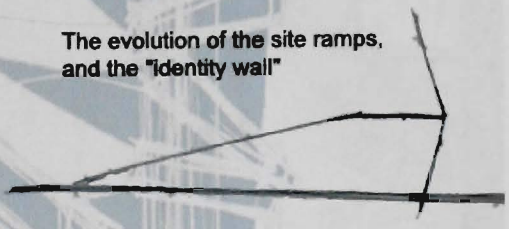


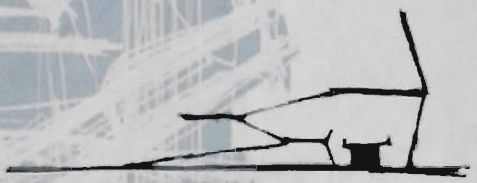


The attempt to bring movement into the site, not only literally, but physically in a possible sweeping bridge form that would be pedestrian friendly, and attractive.

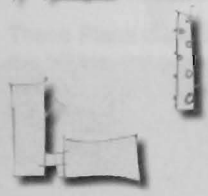


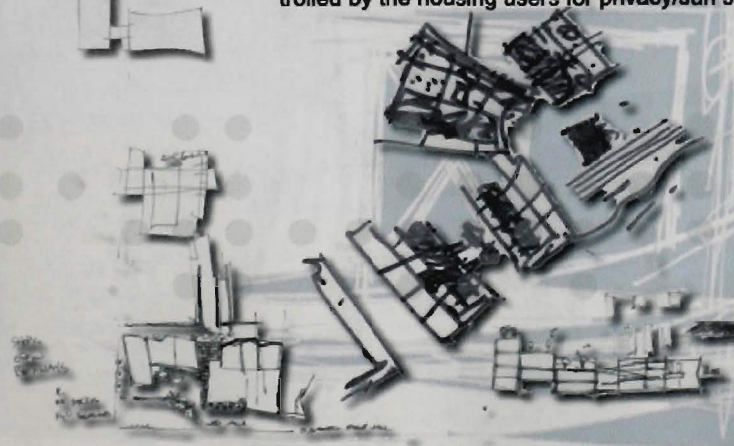
The evolution of the site ramps, and the "identity wall"

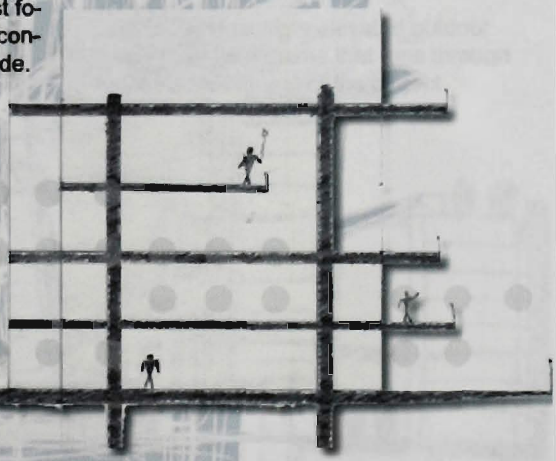


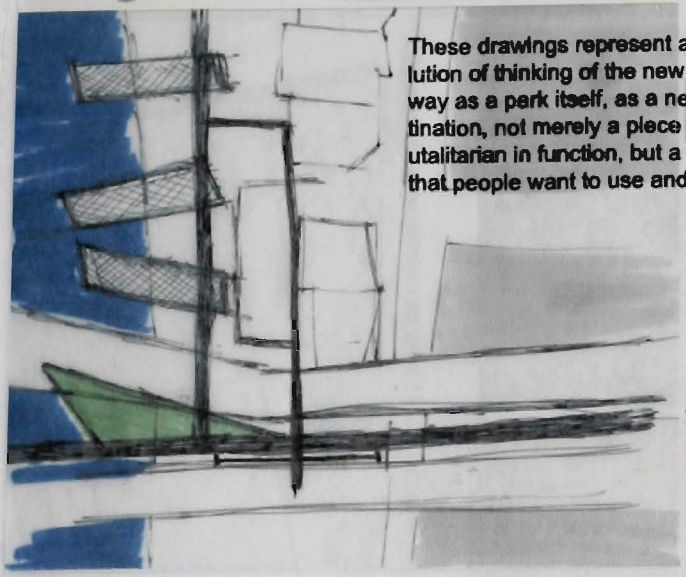


As the idea of facades that interact with the things around them many studies began to occur, most focused on the idea of LCD panels that could be controlled by the housing users for privacy/sun shade.

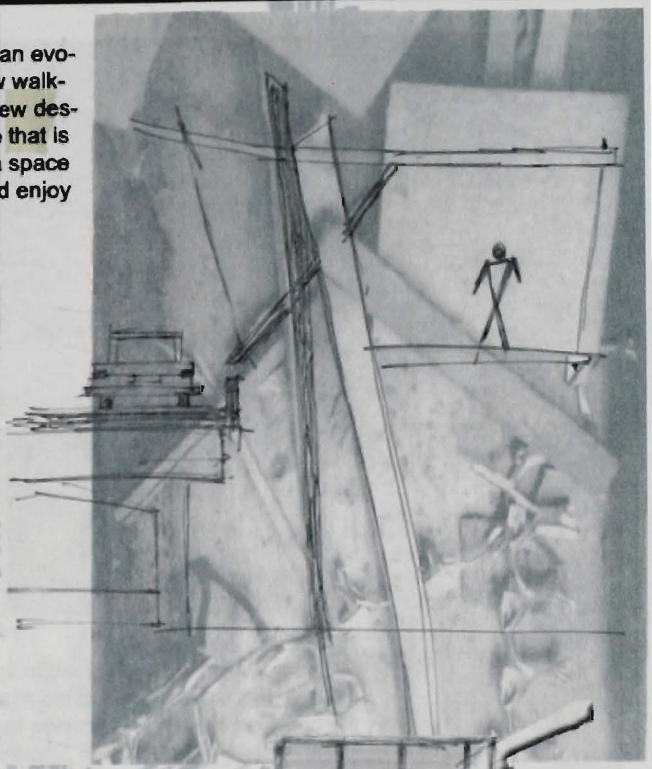


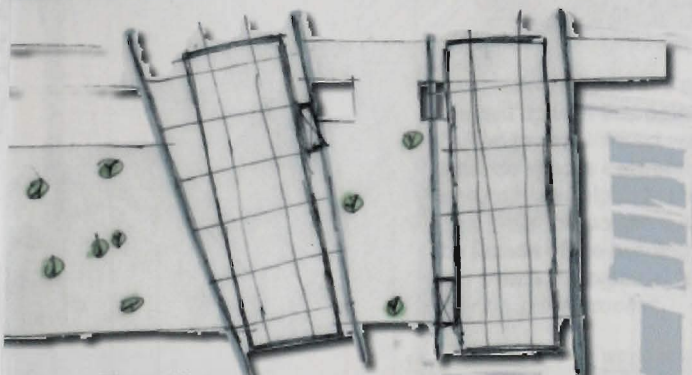




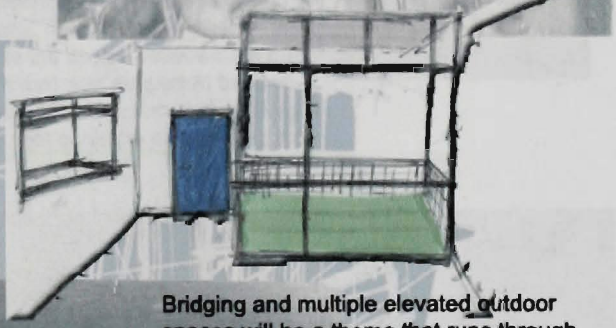


These drawings represent an evolution of thinking of the new walkway as a park itself, as a new destination, not merely a piece that is utalitarian in function, but a space that people want to use and enjoy

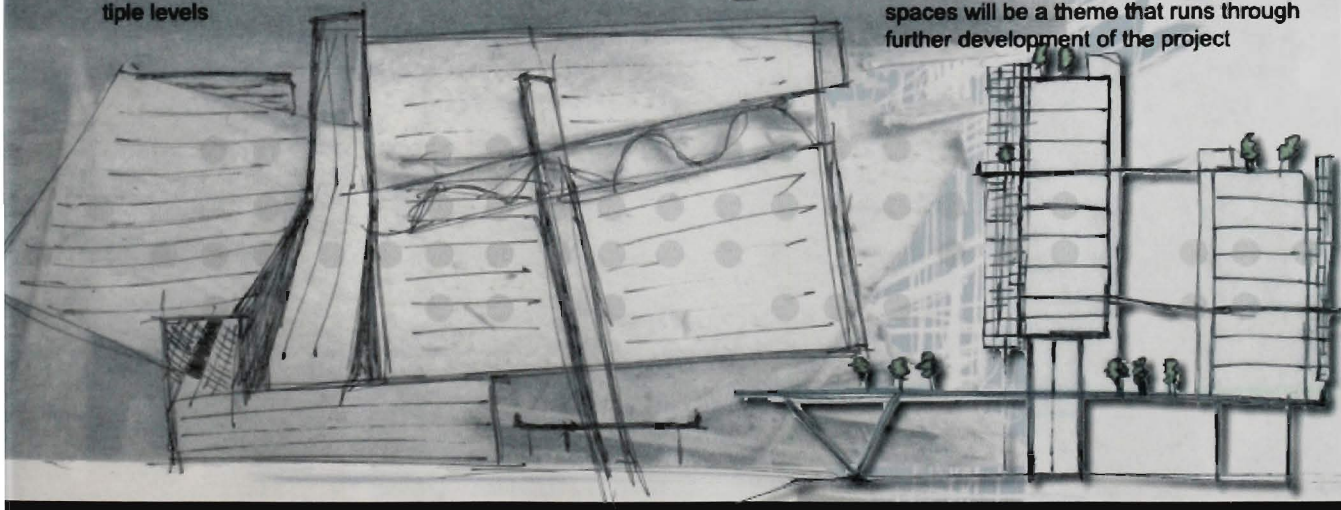




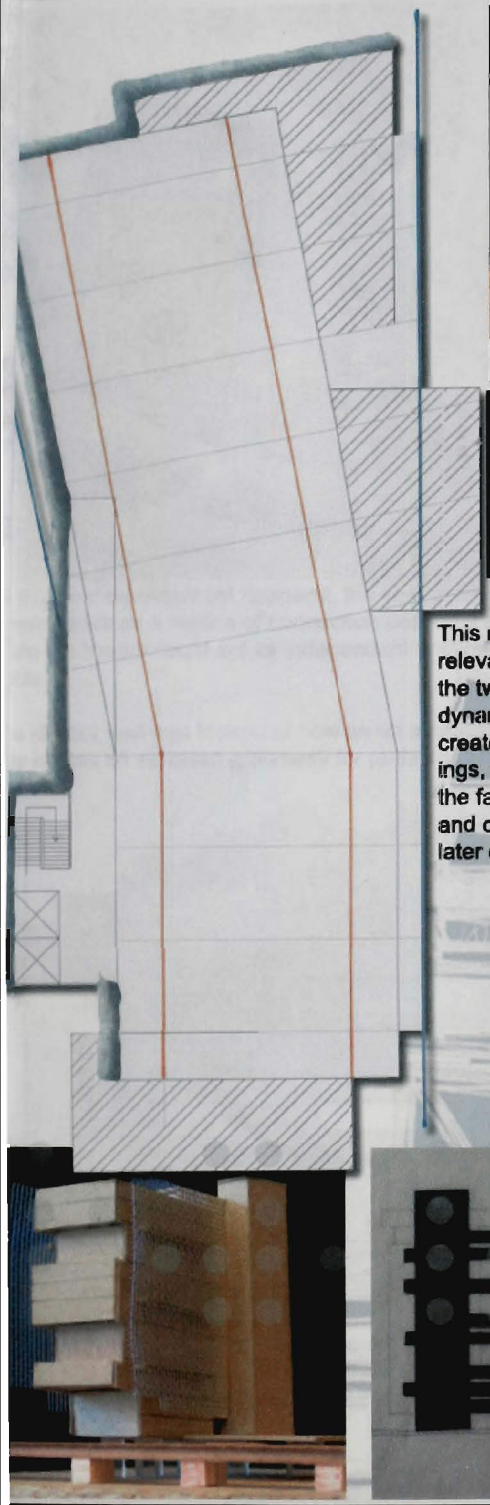
These Plans show the ideas of parks elevated off of the bridge, yet preivate enough to be used by the towers residents, which are now connected on multiple levels

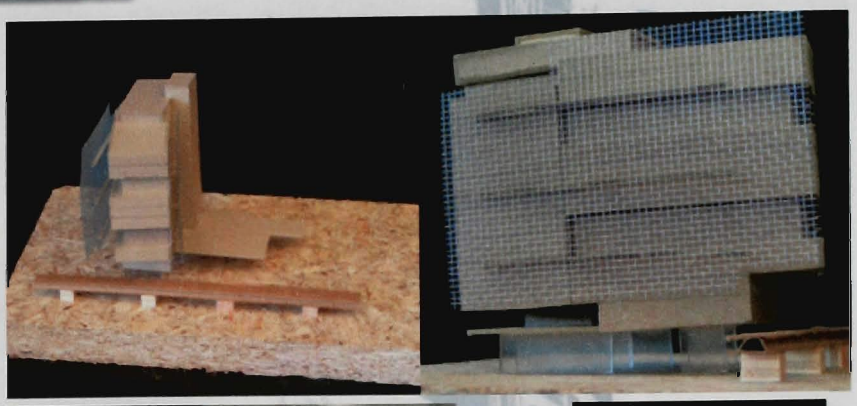


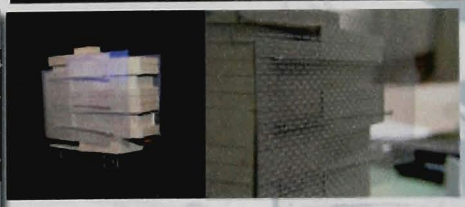
Bridging and multiple elevated outdoor spaces will be a theme that runs through further development of the project



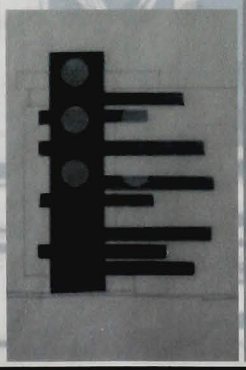
Design Process

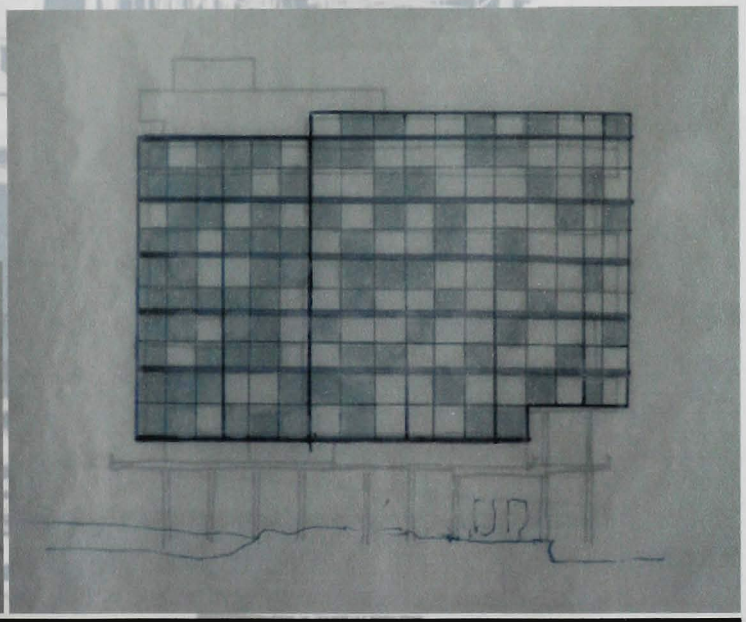


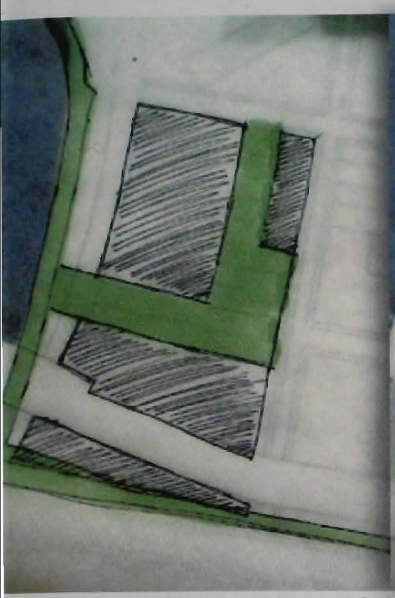




This model represented all of the ideas that had seemed relevant up until that point, most importantly the idea that the two towers interact with eachother to create new and dynamic spaces between them. The "cradling" that was created here helped to identify the space between the buildings, while the screen system that was suspened beyond the facade of the building helped to ad layers to the design and create the areas of "slip" that could be explored further later on in the process.

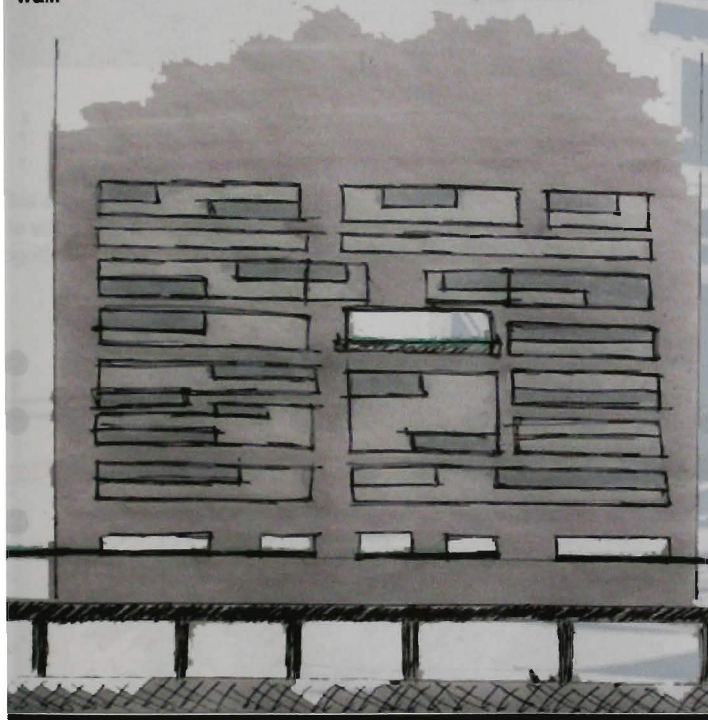




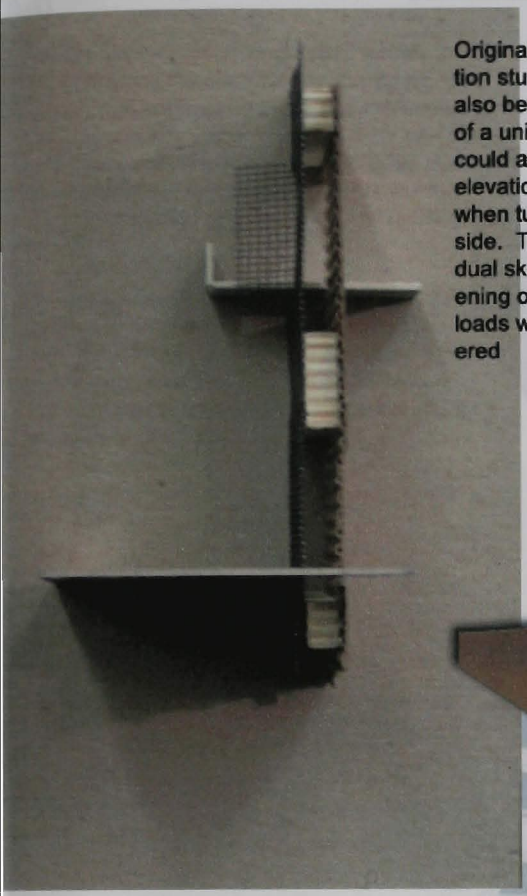


As this final development happend, the idea of the layering of outdoor greenspaces as a means of connection becomes appearant. With these the towers could act as independant entities, yet remain a whole.

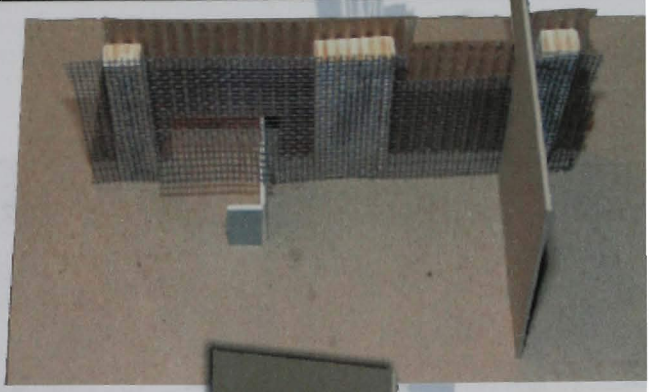
The identity wall was looked at now as an inhabitable space that not only carries an elevated greenway for pedestrians, but acts as a living wall.

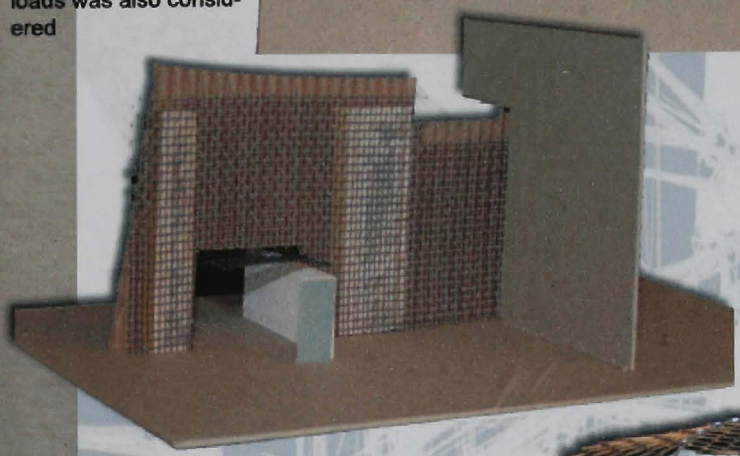


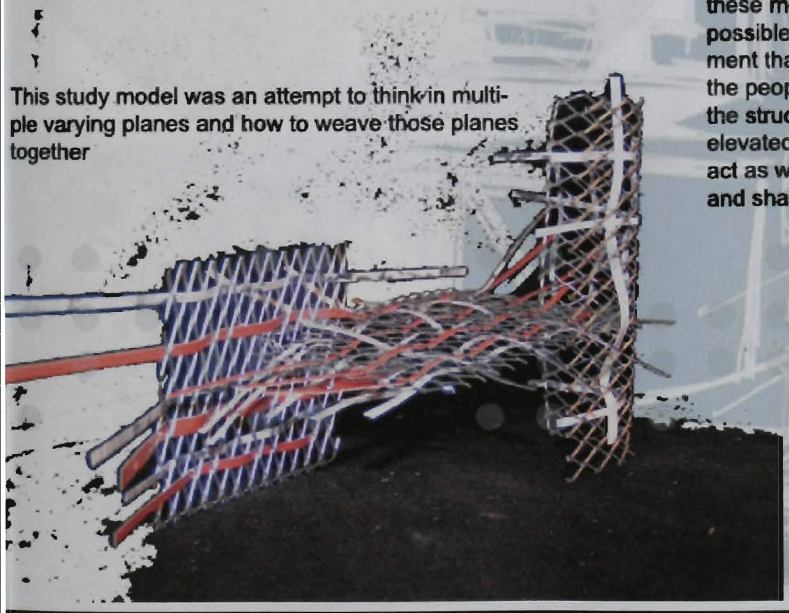
Design Process



Originally a wall section study model, it also became an idea of a universal unit that could also incorperate elevation elements when turned on its side. The idea of a dual skin for the lessening of mechanical loads was also considered

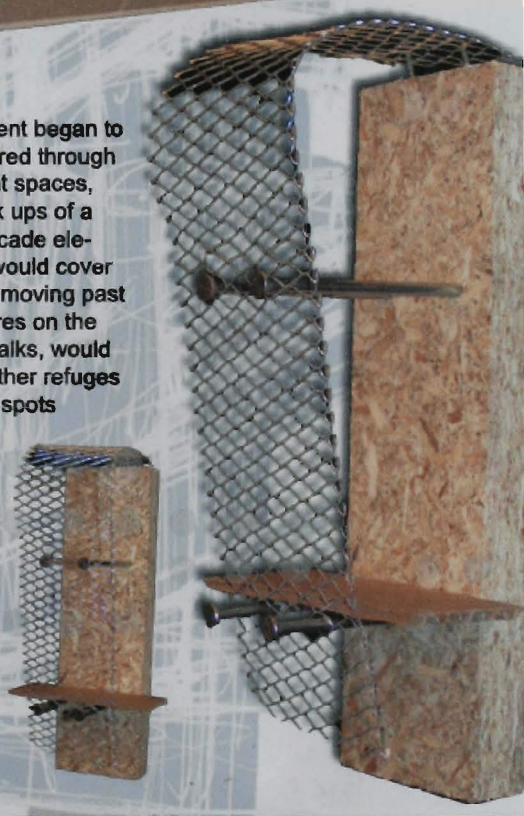






This study model was an attempt to think in multiple varying planes and how to weave those planes together

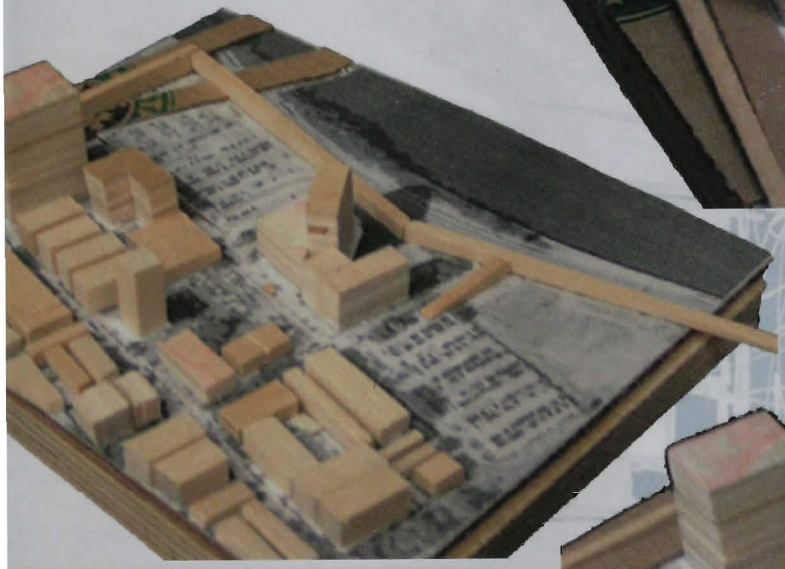
As movement began to be considered through the different spaces, these mock ups of a possible facade element that would cover the people moving past the structures on the elevated walks, would act as weather refuges and shade spots

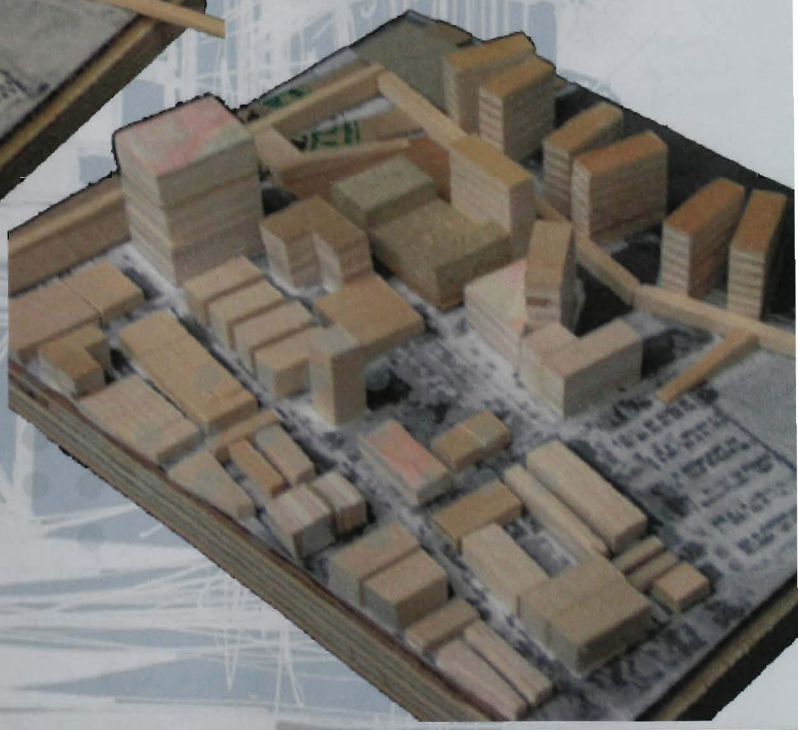


Design Process

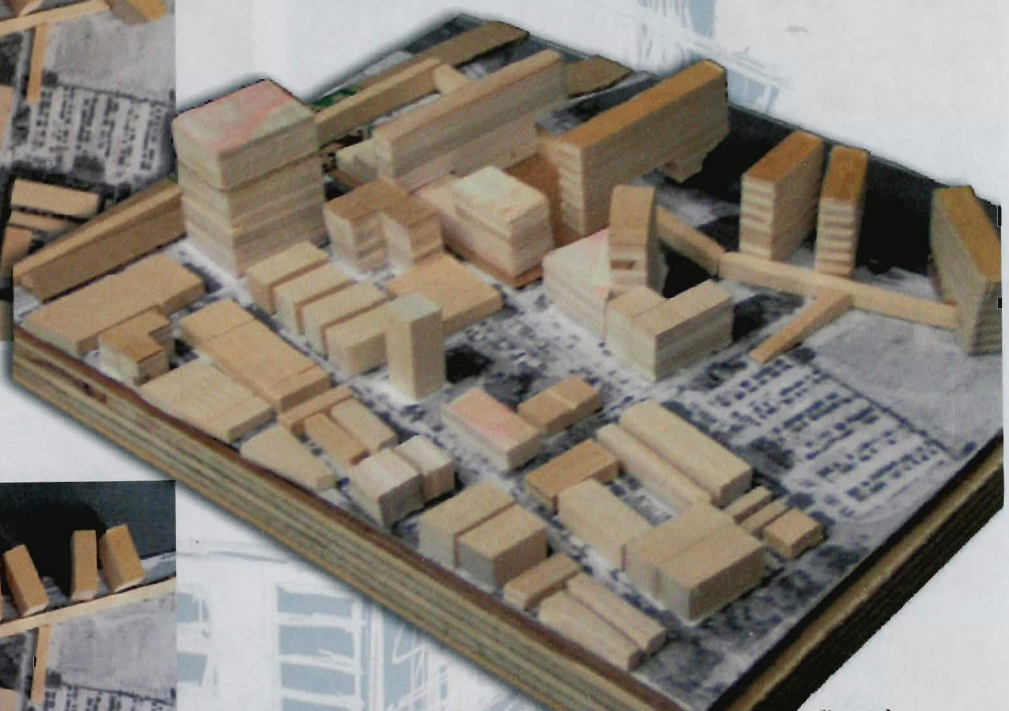
As site development progressed further the idea of spanning and reconnecting to the surrounding areas, and connecting disjointed regions became a major concern. Another factore that was always considered was how to create an edge along the river and how any housing towers would interact with the elevated bridgethat connected them.

The other point of exploration was the city block site itself and how it could interact with the surrounding context and to create a softer edge to lessen the impact of highrise construction in an area that is predominately mid rise in character

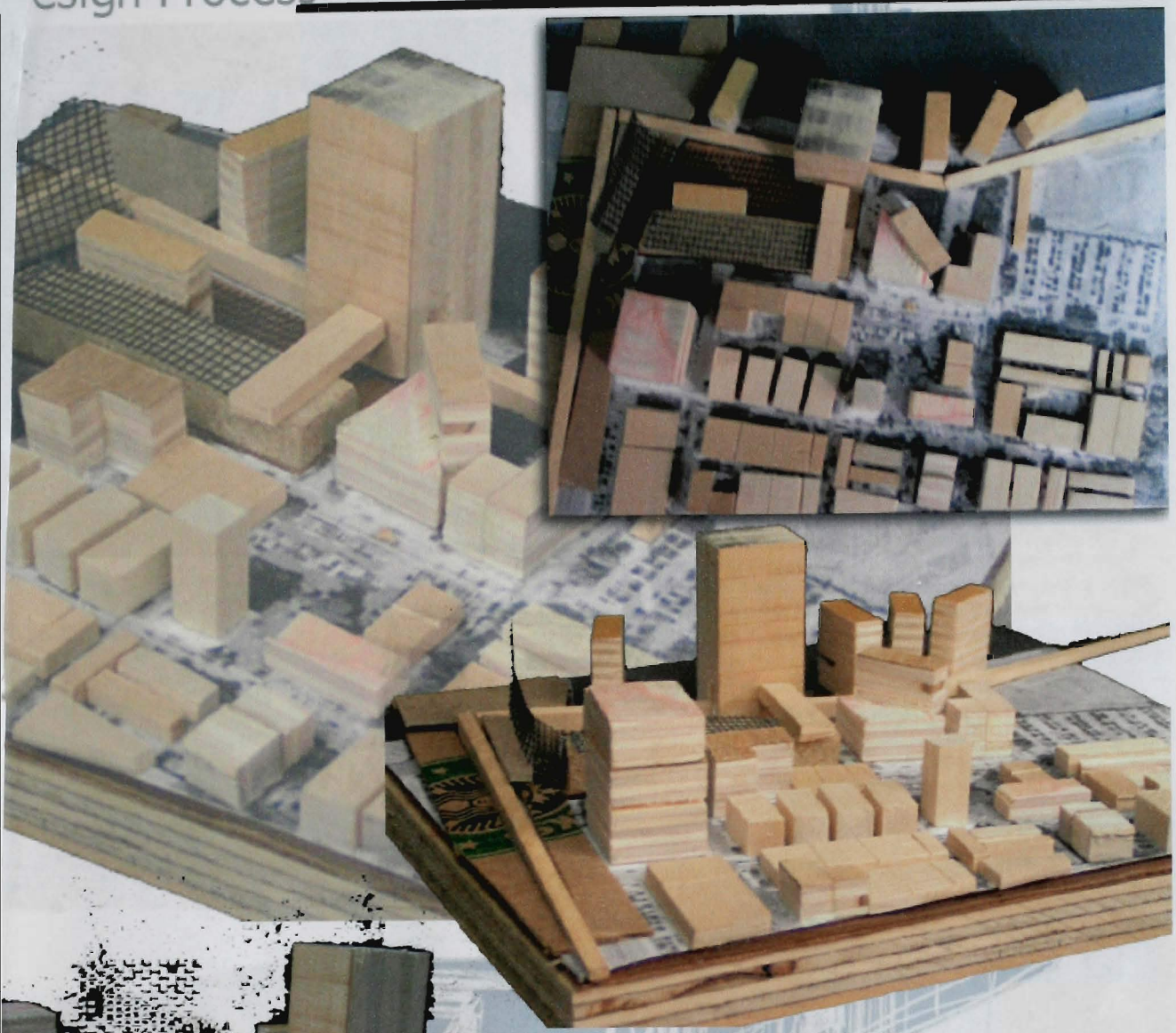




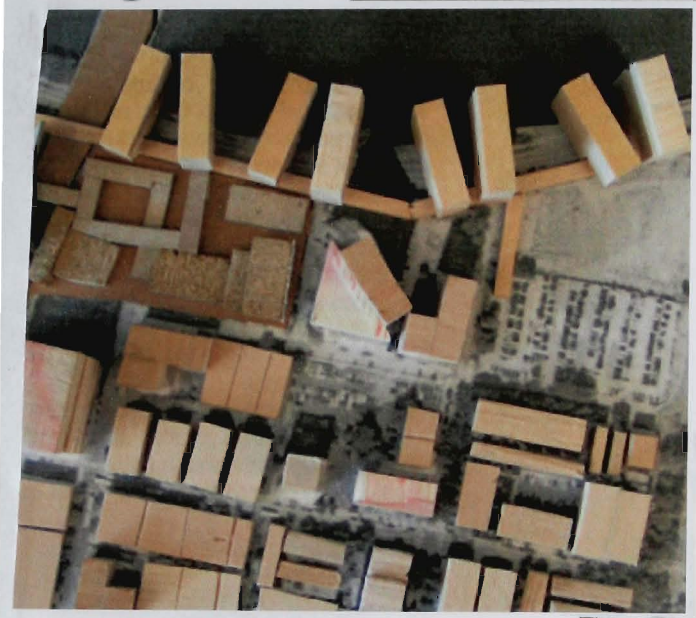
This particular study focused on the idea of bridging the bridge to create unique covered areas as people moved across the walkway. This also created a dynamic within the site, where the housing structures met the ground

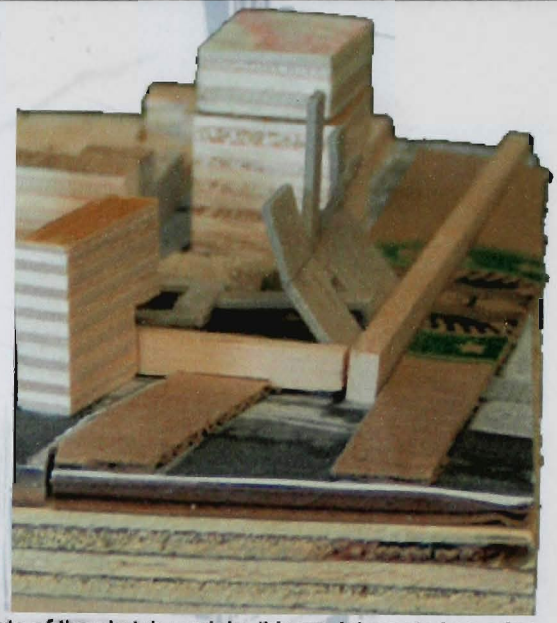


This model was a study of addressing the street edge of the site and creating a park along the elevated walkway, this was one of a series of different attempts of making a street condition that met the esisting area



This model tested many different ideas, the first of which was the possibility of one larger tower that could act as a focal point for the project, while still being flanked by smaller developements so as not to be a stand alone. Then next major idea was the creating of the floor to wall move which was done in screen, to take the idea of the ground plane flowing up to form a protective barrier for the site. Other issues of site frontage are still futher explored with new ideas, and layering of levels for more dynamic spacial characteristics and interactions.





The most complete of the sketch models, this model created an edge along the river, while still interacting with the greenway in such a way as to not seem like it is only to be used by the people who lived there. It developed an intricate ramp system within the site to connect to the greenway and it has a buildings that create a sense of a continued built environment across the front of the site. The identity wall was also developed to its potential of acting as a focal point and sound dampener

Design Process

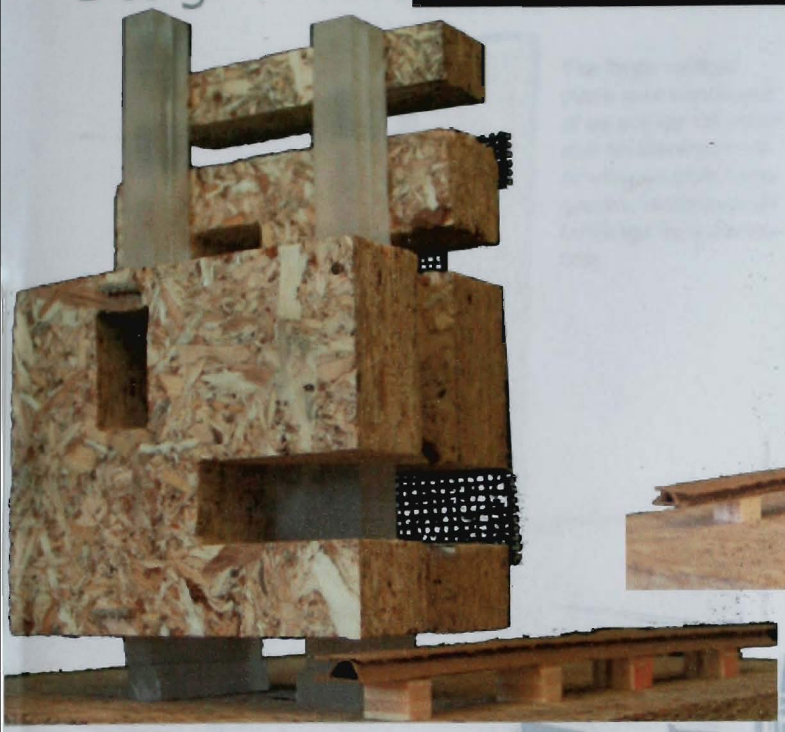
As the site progressed, the towers too began to take form. The initial ideas of haveing an exposed vertical circulation element began to take form, more importantly though, the idea that formed from this model and influenced all the others was how to effectively get the building to meet the bridge. This initial model began to infrom of the necessity to pair the towers for vertical circulation that would be to code.

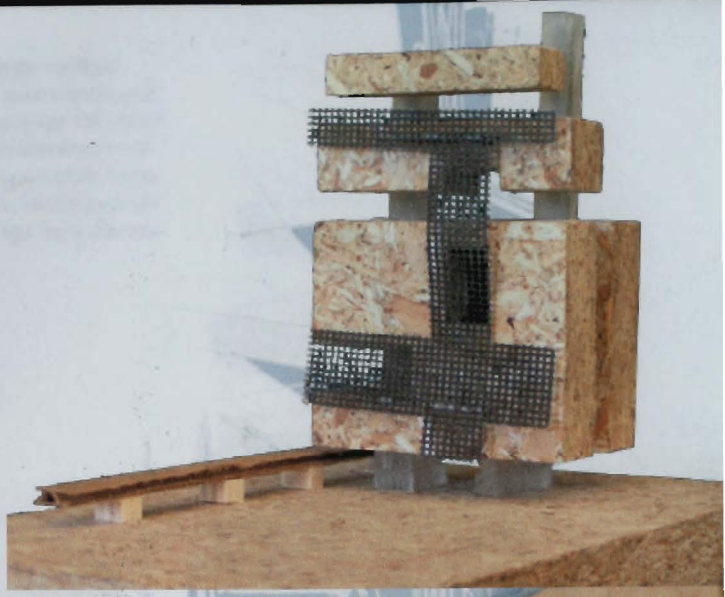
The major critique of the current model is how the "legs" of the building hit the ground and how that condition now is very brutalist, and needed to be handled with more sensitivity.

Tower Development

Fall 2006

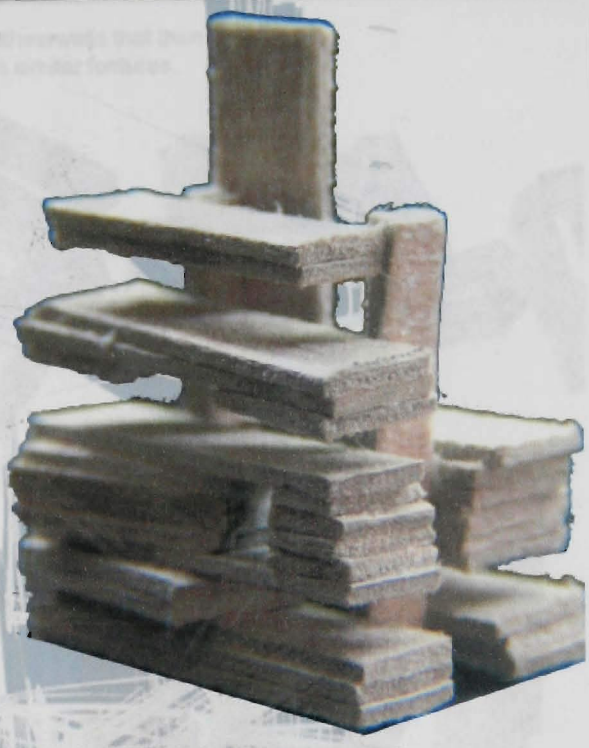
Design Process





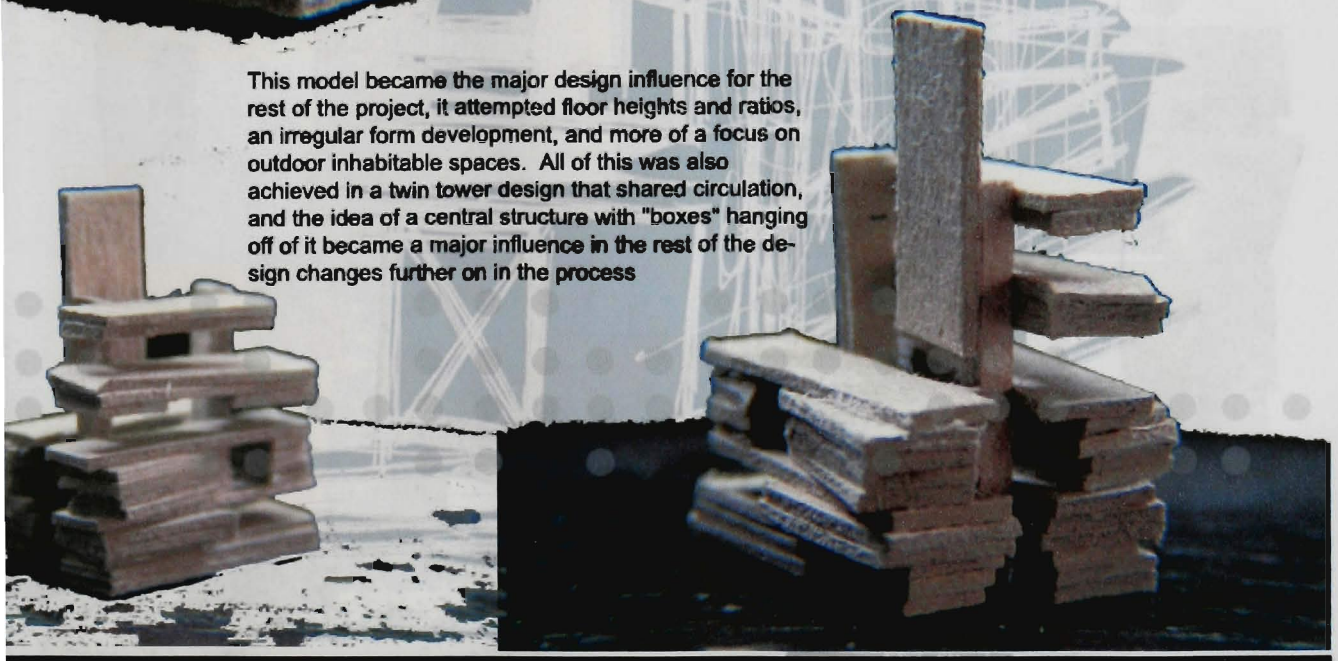
These two models began at the same time. one looking at the building form as a whole, treating with multiple outdoor spaces as you go up the building, continuing the ground plane vertically and beginning to give the building an interesting form. Also the ideas of giving outdoorspaces much like the suburban lawns began to influence the design so that users would actually want to use these spaces. Alternately the lower model is a ground floor section/elevation on how to connect the towers to the ground, and help to tie them to the ground plane, the elevated greenway, and the structure itself

The large vertical plane was concieved of as a solar collector and an identity marker with possible large graphic to distinguish buildings from eachother



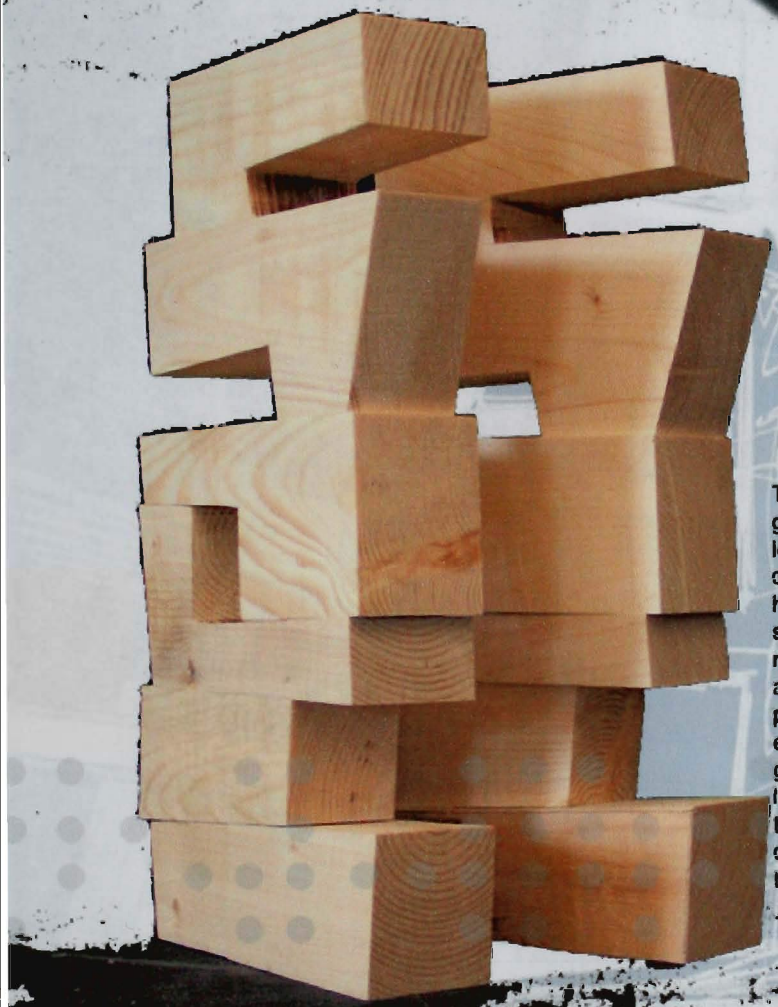
The hole in the lower levels was idealized as continuous and a park like area for the residents to enjoy

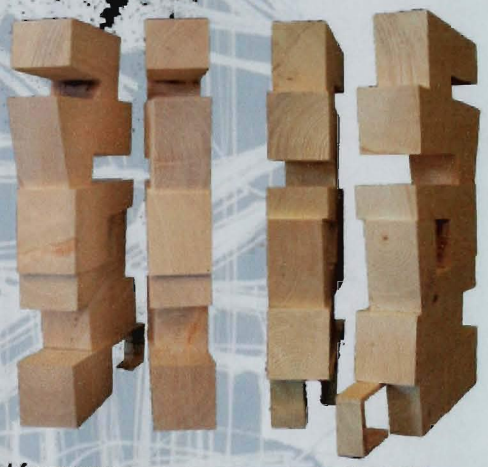
This model became the major design influence for the rest of the project, it attempted floor heights and ratios, an irregular form development, and more of a focus on outdoor inhabitable spaces. All of this was also achieved in a twin tower design that shared circulation, and the idea of a central structure with "boxes" hanging off of it became a major influence in the rest of the design changes further on in the process



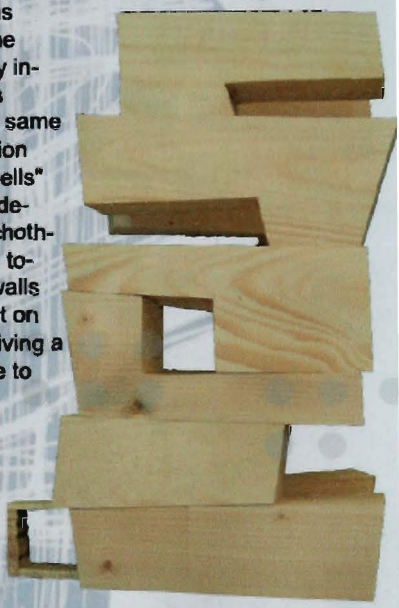
Design Process

These independent pieces are imagained as shaken up and scewerd on the shearwalls that then hold them up. Ideally each pair of towers would vary greatly in form yet retain similar features.





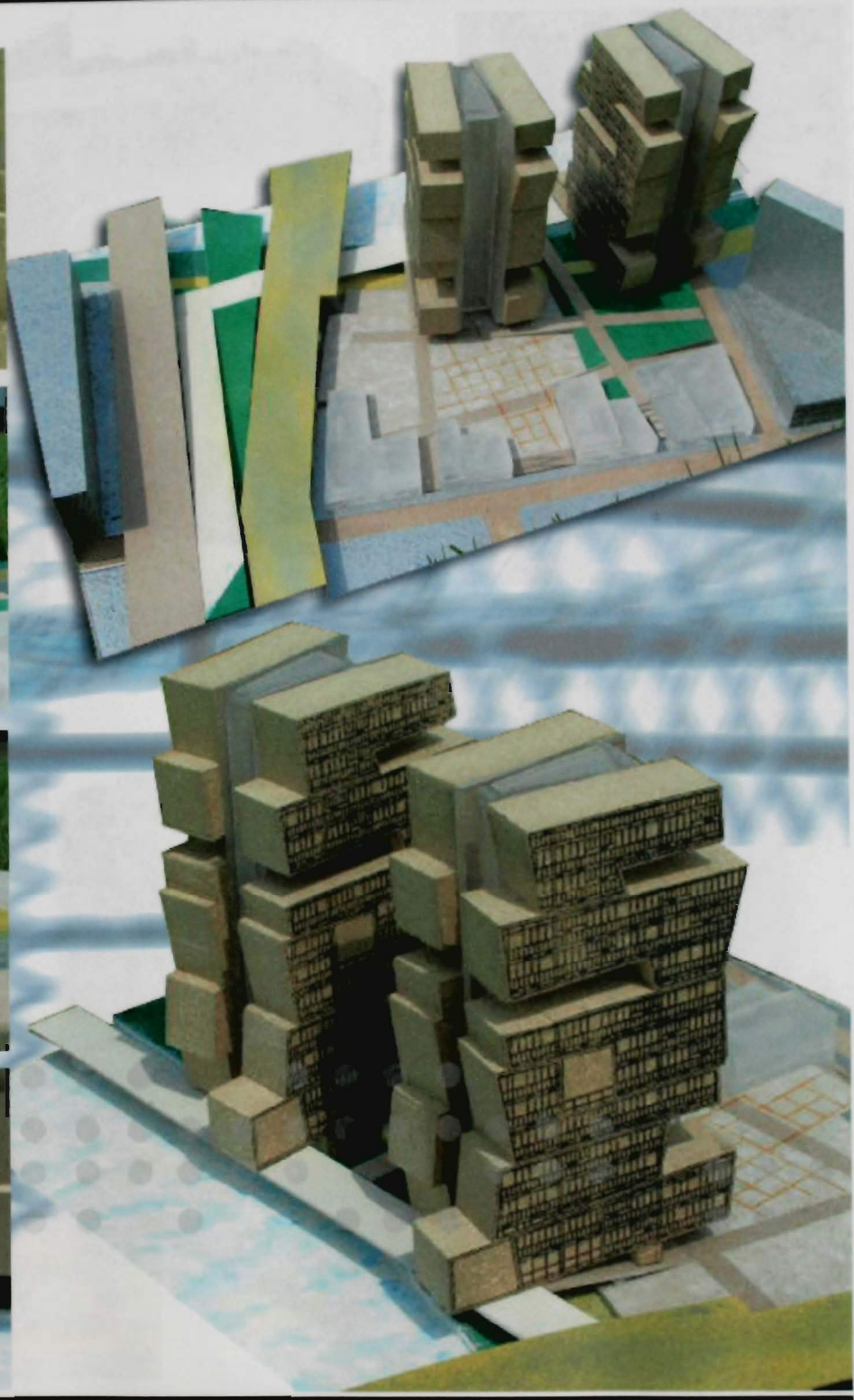
This final form was generated from the idea of completely independent peices hanging off of the same structural-circulation network. The "shells" are completely independant from eachother and are all tied together by shear walls limiting the impact on the ground and giving a clean appearance to the structure



Site Plans

Winter 2006

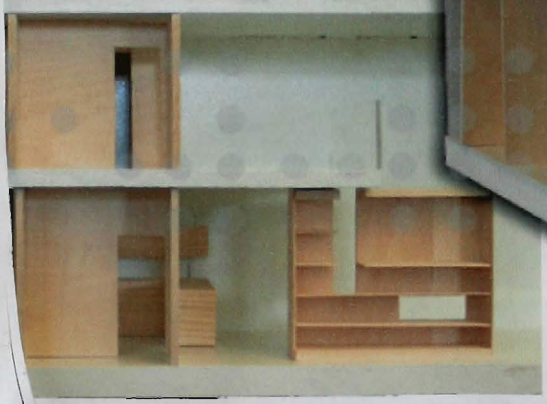
Final Drawings



Site Model

May 2006

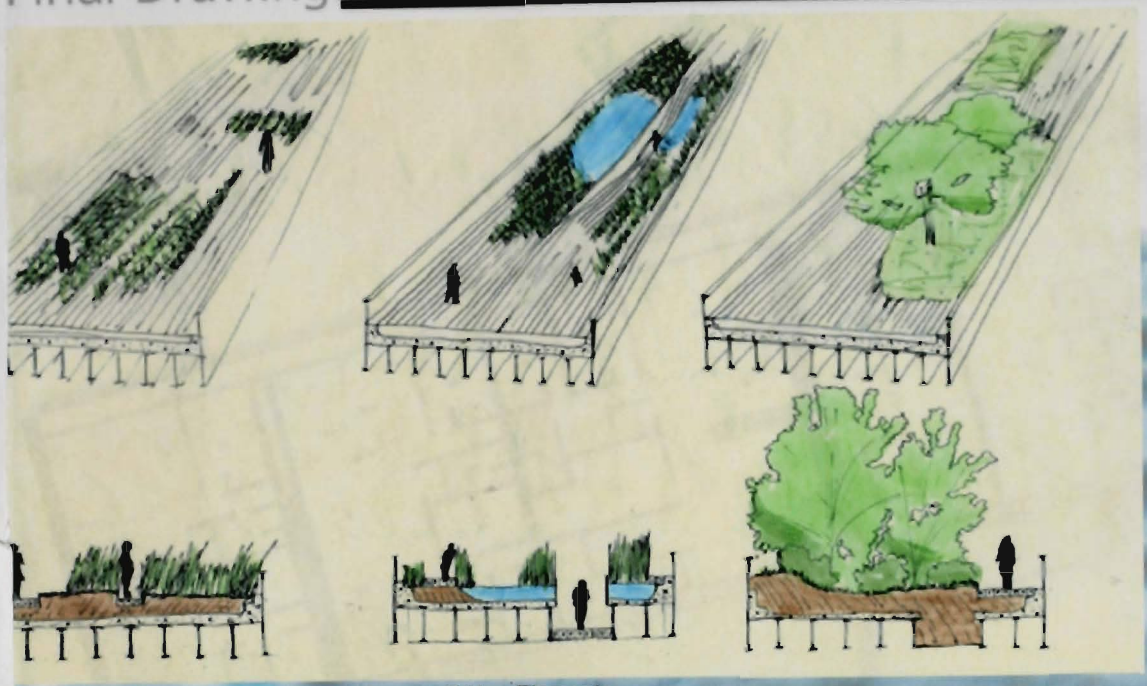
Final Drawings



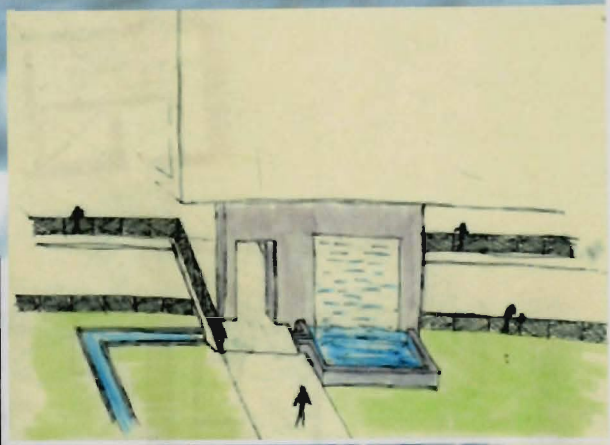
Unit Model

Winter 2006

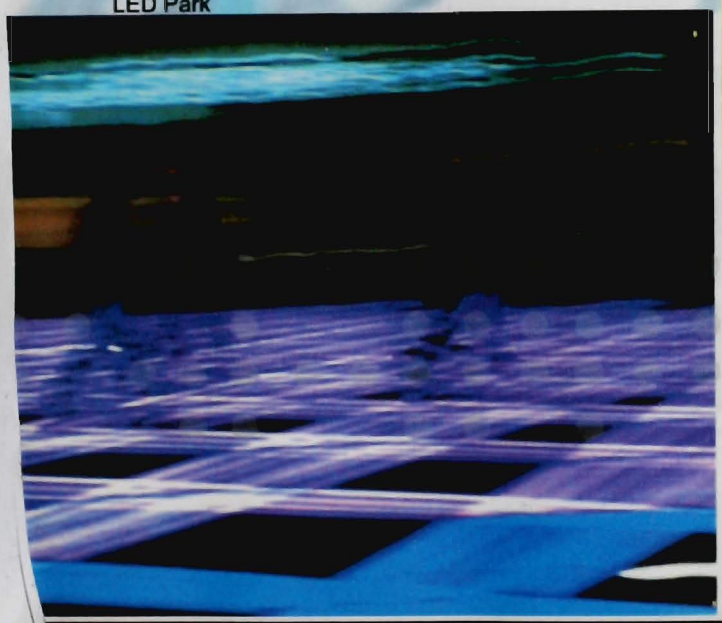
Final Drawings



Bridge Elements



LED Park



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Floor Plans

Winter 2006

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Floor Plans

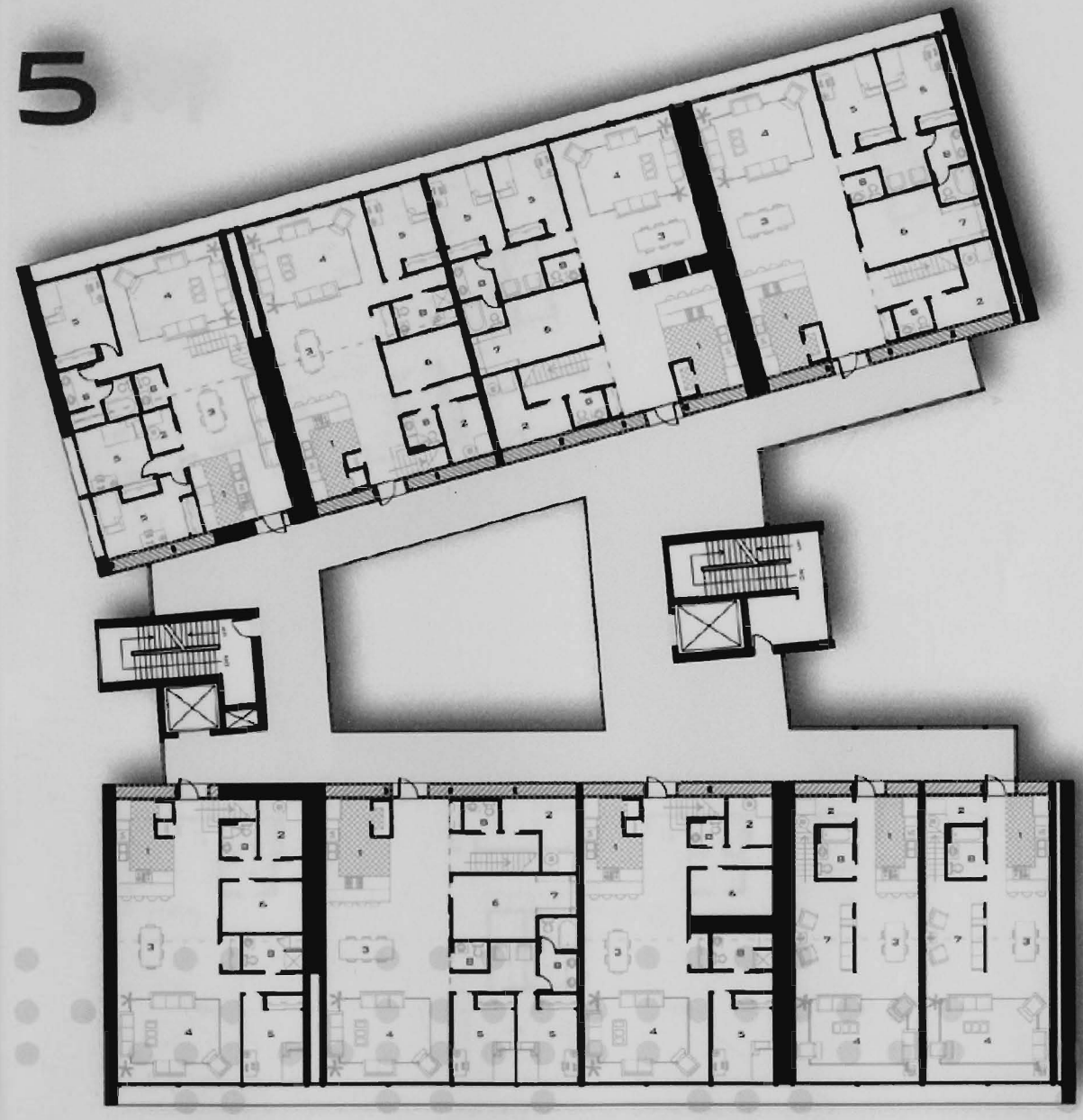
Winter 2006

3

Floor Plans

Winter 2006

5



Floor Plans

Winter 2006

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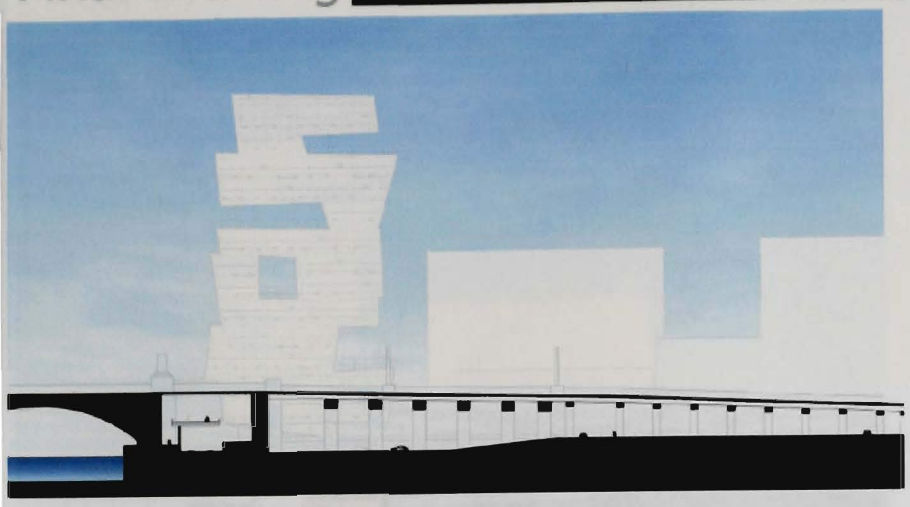
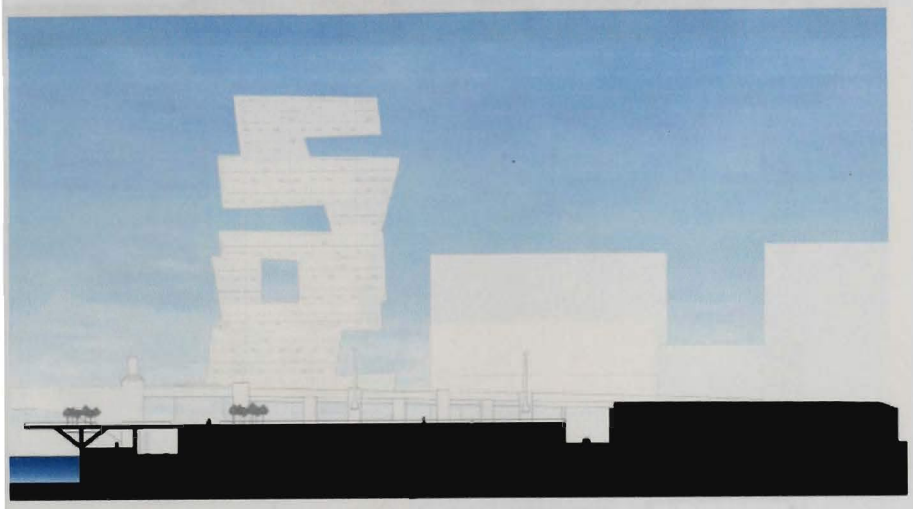
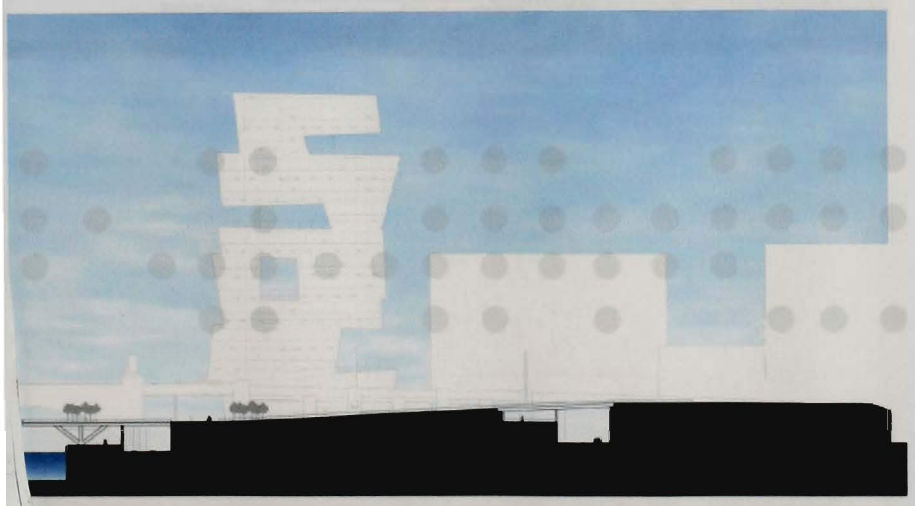
Final Drawings







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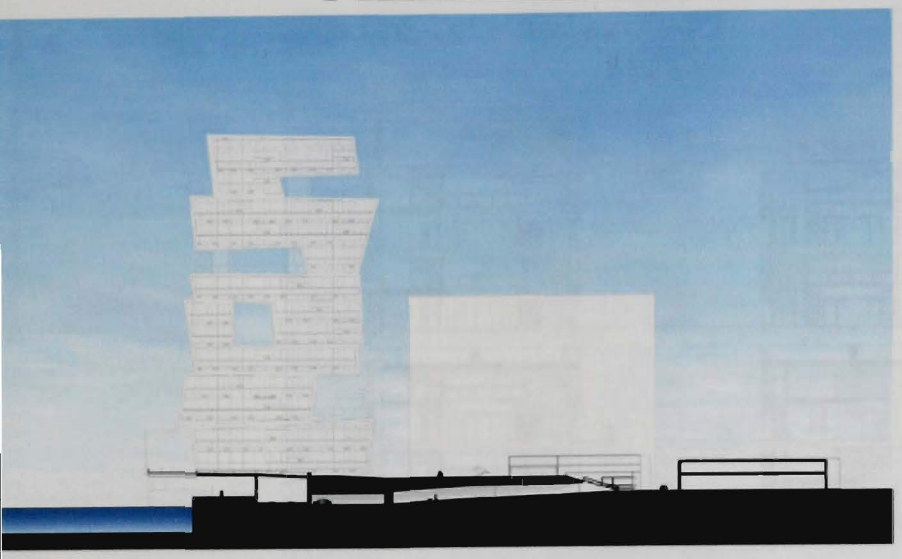
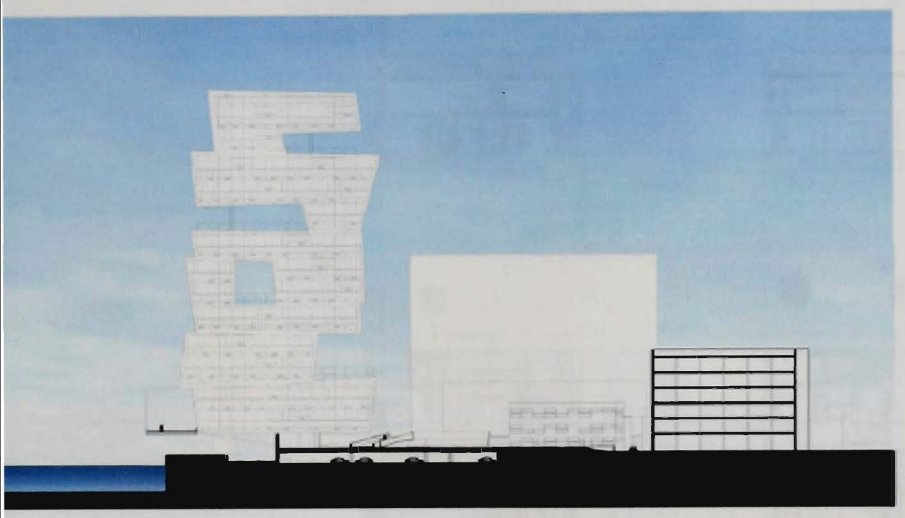
Winter 2006

Final Drawings





Final Drawings

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Sections

Winter 2006

Final Drawings

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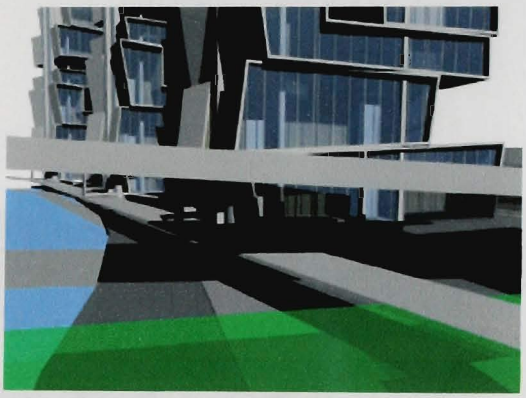
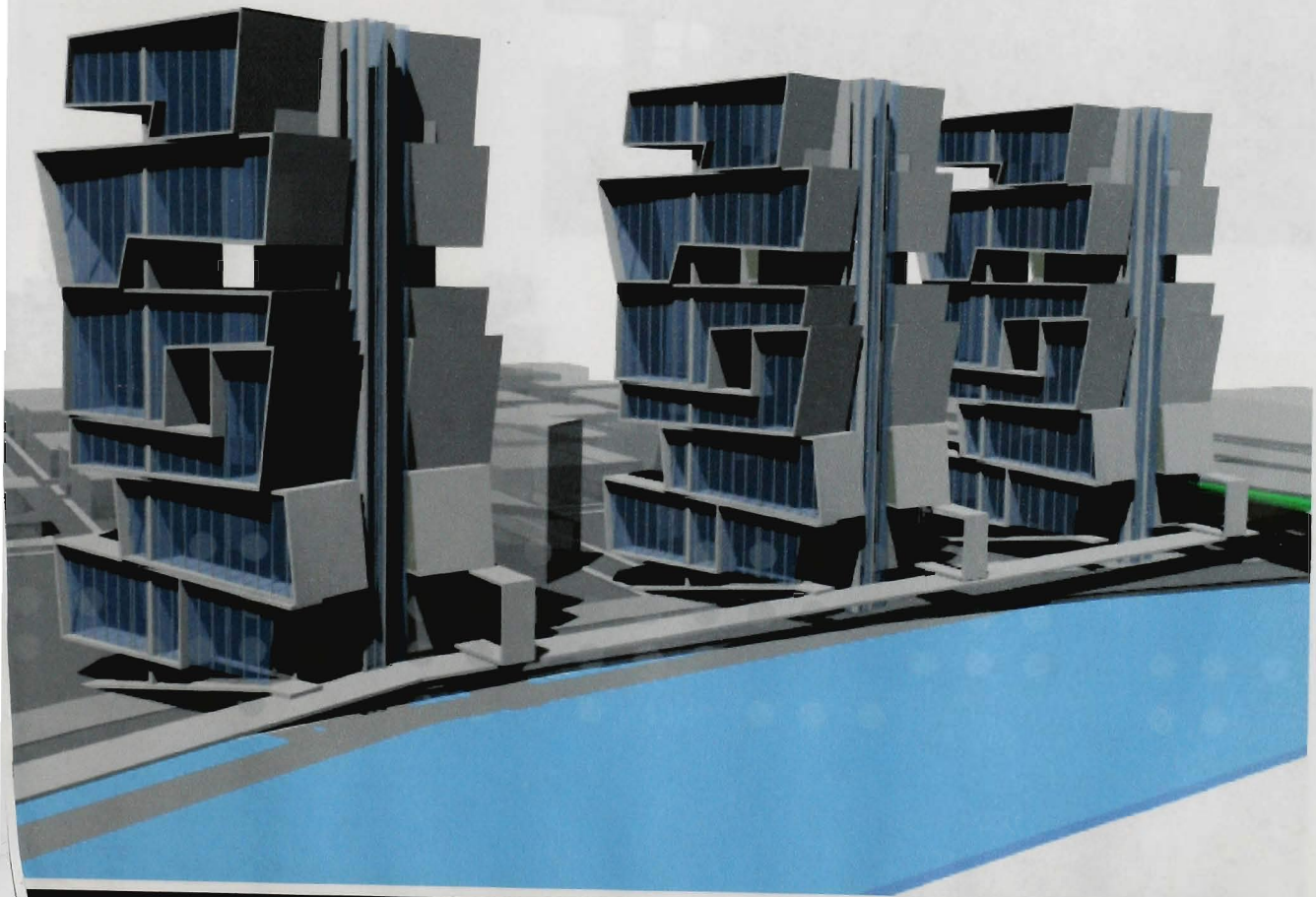
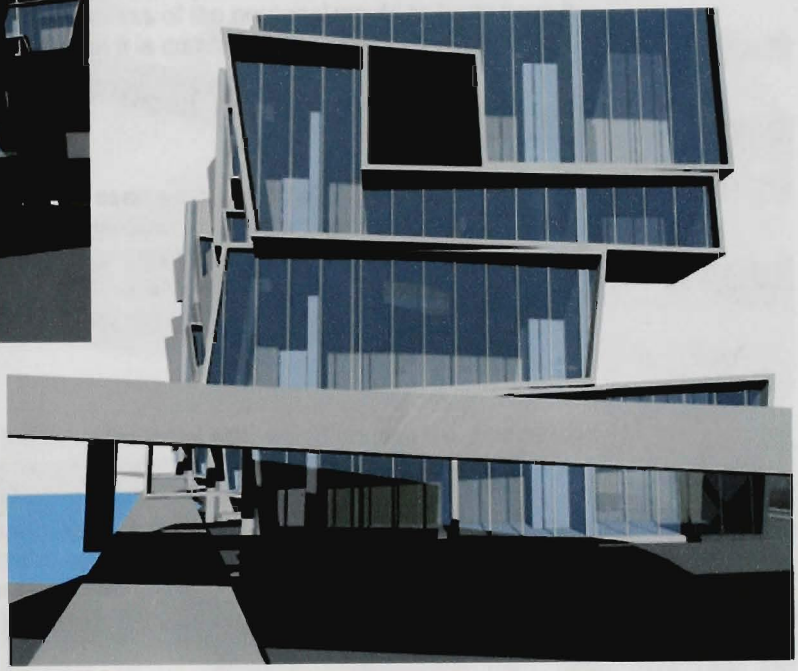
Winter 2006

Final Drawings





Final Drawings



Conclusions

Overall the projected seemed very successful, and the incorporation of outdoor spaces within a high-rise environment could offer new possibilities people had not thought of before. However the only way to really measure the success of the proposal would to be to have it built and let the occupants decide weather or not it is comfortable.

The unit layouts, and the bridge along the river seemed to be the strongest points within the project. Also the use of daylight and operable windows created unique opportunities that users may find very useful. The use of Kalwall to limit the feel of isolation and increase light into the core of the building also seemed to be very strong elements.

The areas that could have been improved were the initial site, which housed the commercial areas and the park, however with more time they could respond nicely with the conditions around them, and the towers. The other major lacking area was the inability for people to claim their own space outdoors. This was raised during the critic and although the thesis was not intending on creating true personal outdoor space, it did seem another desire that is greatly appreciated within the suburban condition.

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