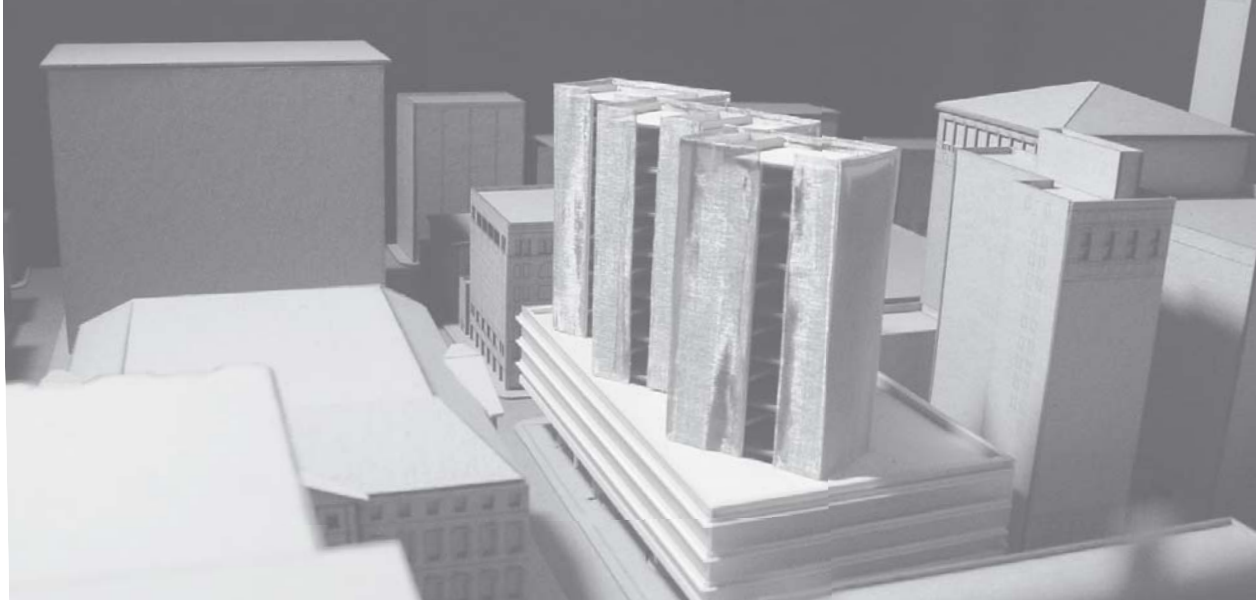


# where learning meets dwelling



anne michael jordan

Thesis submitted to the faculty of Virginia Polytechnic Institute and State University  
in partial fulfillment of the requirements for the degree Master of Architecture

May 16 2006

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Key words: mixed-use, school design, apartment residences, urban community

# where learning meets dwelling

anne michael jordan

If a city is to undergo a re-birth then why not start from the beginning of life: childhood. This project explores the place of the child in the city and how a re-urbanizing area can benefit from the presence of the child. The thesis also looks at the home and what makes a good urban dwelling for a family.

The program for the thesis evolved as a reaction to these queries as a mixed use urban center that brings together family residence towers with private yards, and a school that incorporates day care and teaches pre-school through fifth grade.

**Abstract**

“We shall not cease from exploration. And the end of all our exploring will be to arrive where we started and know the place for the first time”.

- T.S. Eliot

First of all I must thank my greatly influential colleague and most admired friend, Edward, without whom this experience would not have been nearly as enjoyable.

I would like to thank my parents for their continuing love and support through whatever I choose to do with my life.

I would also like to thank my committee for their patience and assistance in bringing this project to conclusion.

And lastly, I would like to thank those professors who first introduced me to architecture, without their inspiring influence I would never have made it this far.

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**Process**



St. Louis, Missouri

The choice of program for this thesis started with a consideration of the de-urbanized city. As an important American city in the late 19th and early 20th centuries, St. Louis experienced a rapid growth in its downtown population. This boom caused a large number of buildings to be constructed during this period, buildings that would long outlast those who built them.

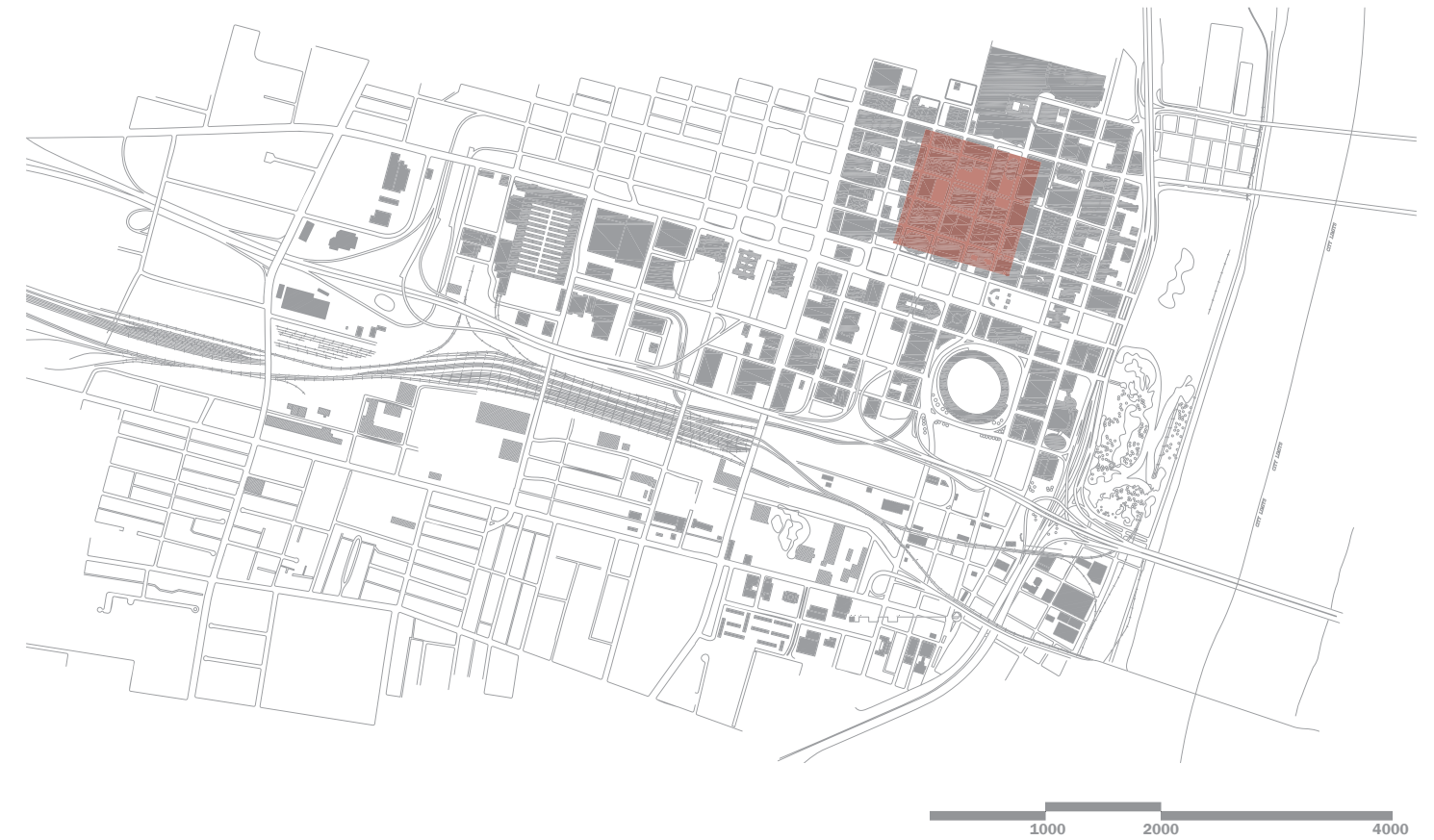
Years later, many saw these abandoned industrial warehouses as scars on the city. Due in part to the forces of urban renewal in the 1960's and 1970's the city experienced a strong deflation in its urban population resulting in an urban ghost town.



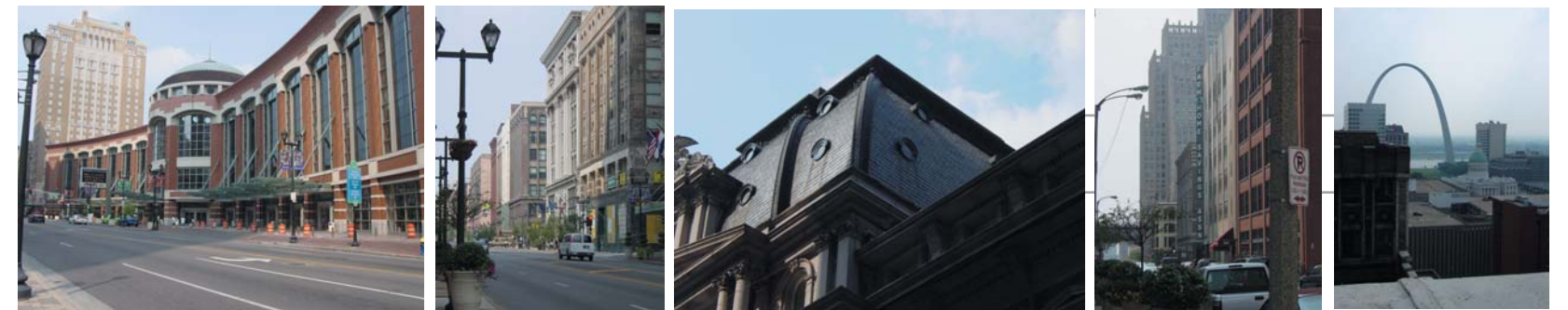
Drawing of Downtown St. Louis in 1914



Photograph of riverfront after urban renewal



Downtown

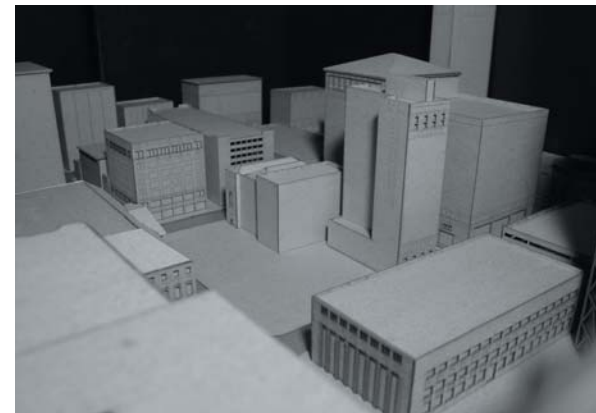


## History of a City

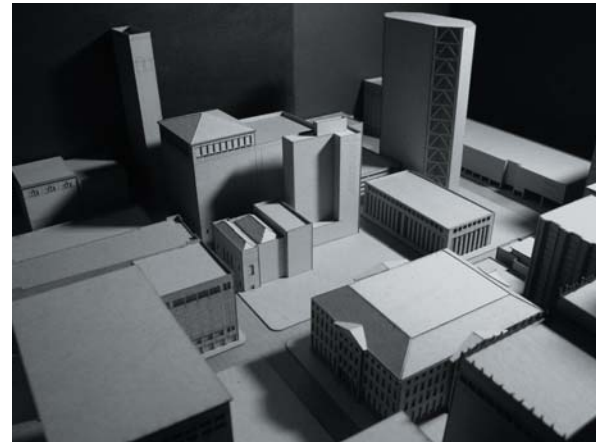
Recently, civic efforts and developer investment have spurred momentum in the revival of the downtown. However, walking down the streets of the city, banners advertising the newest artists' lofts or luxury condominiums greatly outnumber the fellow pedestrians encountered.

Necessities for urban living are just beginning to make their way back to the city. A corner grocer with a modest inventory of goods, an even smaller drug store and retail stores here and there are the extent of the services that the downtown has to offer an urban dweller.

Unfortunately, the real signs of life are even harder to find. Essential neighborhood elements like schools, libraries and parks remain absent from developer plans, as they rank low on the scale of investment returns.



Looking north toward site



Site from the west



Western corner of site



The idea behind the thesis was to make a move toward a more livable downtown by taking into consideration what is required for a family to dwell in an urban area.

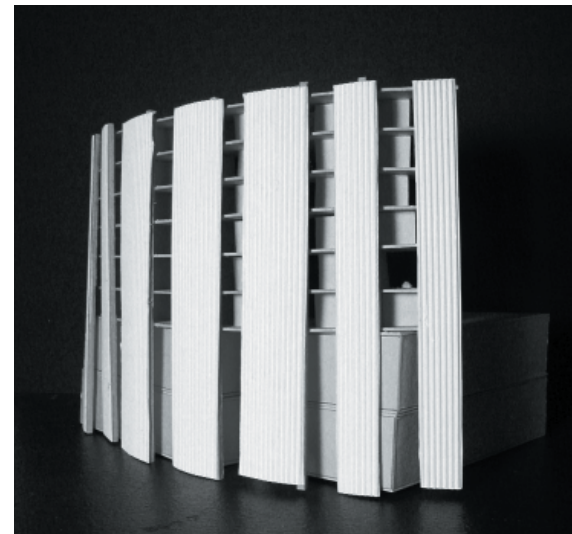
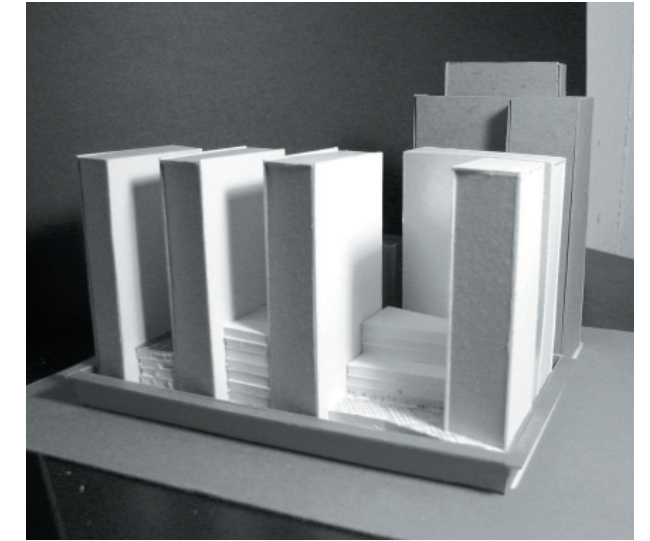
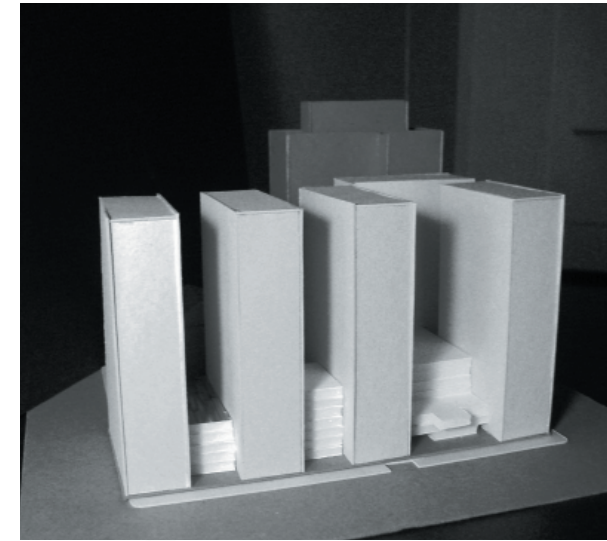
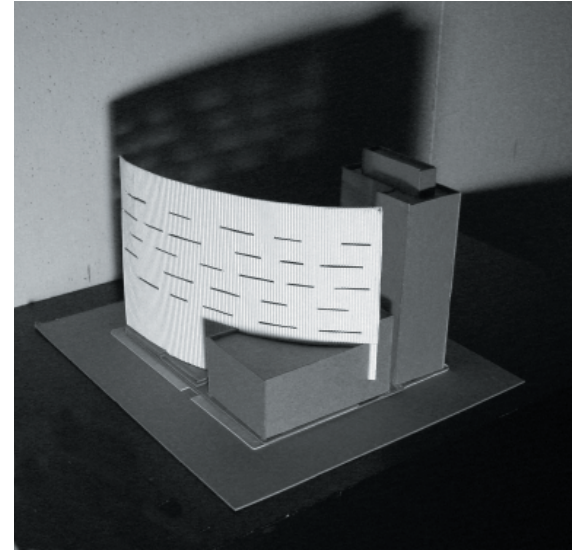
Where are the places for a child in the city and what role can they play to improve the urban whole?

The program established was a mixed use facility that brings together family residences with private yards and a school for day care through fifth grade that incorporates an adult learning center.

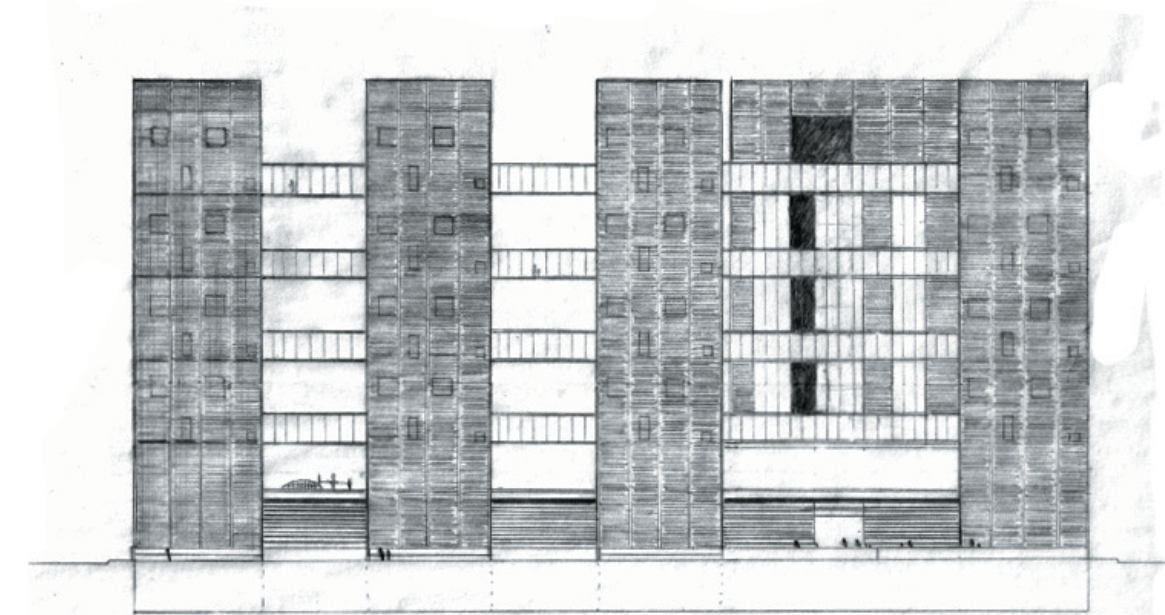
Site and Program Analysis

Initially the two parts of the building seemed to be struggling against one another. There was difficulty in making the building appear as a continuous whole.

Further consideration of the program made it clear that the two elements needed to be their own distinct parts of the building. Thus the tower evolved from the residential element and the school at the base.



## Formal Studies

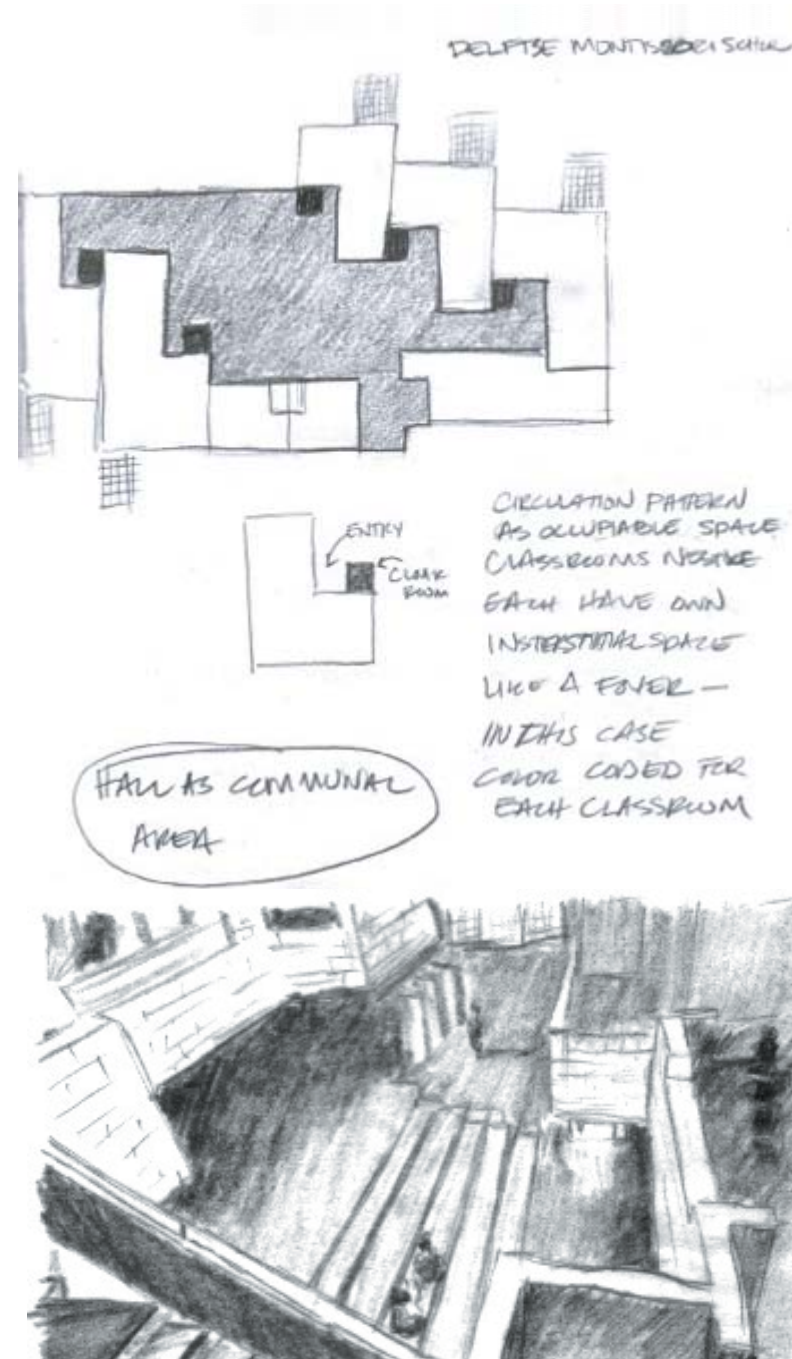


Preliminary elevation of towers and school

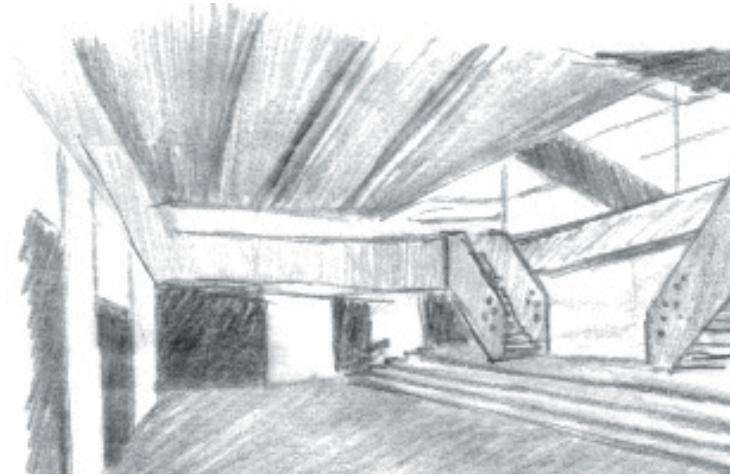
## Herman Hertzberger

In studying the work of Hertzberger, the importance of the child in the city became clear. Allowing others to hear children at play, to see glimpses of their energy, brings a level of life to the street that is not obtained in any other situation.

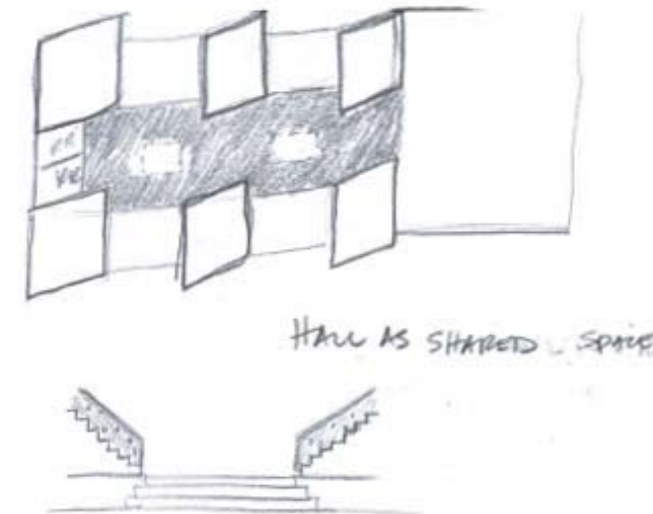
“The school playground is not a closed courtyard, but a public open place, it is therefore part of the street, which makes it attractive for the children in the neighborhood outside school hours, too.” -H. Hertzberger



Sketch of stair as gathering space



Sketch of hall as a central street in Hertzberger's school



In his schools, Hertzberger demonstrates the importance of spaces for gathering. Hallways and staircases become rooms for meeting and learning at the scale of the large group.

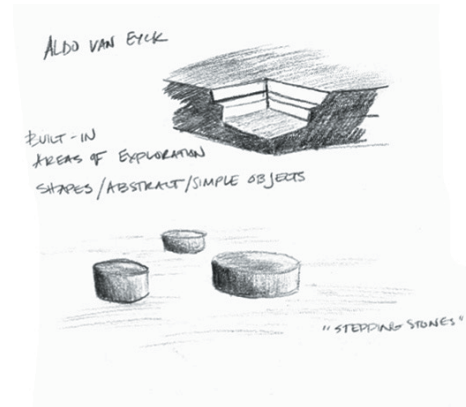
Identification of a child's space is also important. Children will look for ways to distinguish their classroom from another in order to landmark their territory. Classrooms that are identical can confuse and frustrate a child so Hertzberger often color codes the vestibule areas of each classroom to prevent this from happening.

Precedent Studies

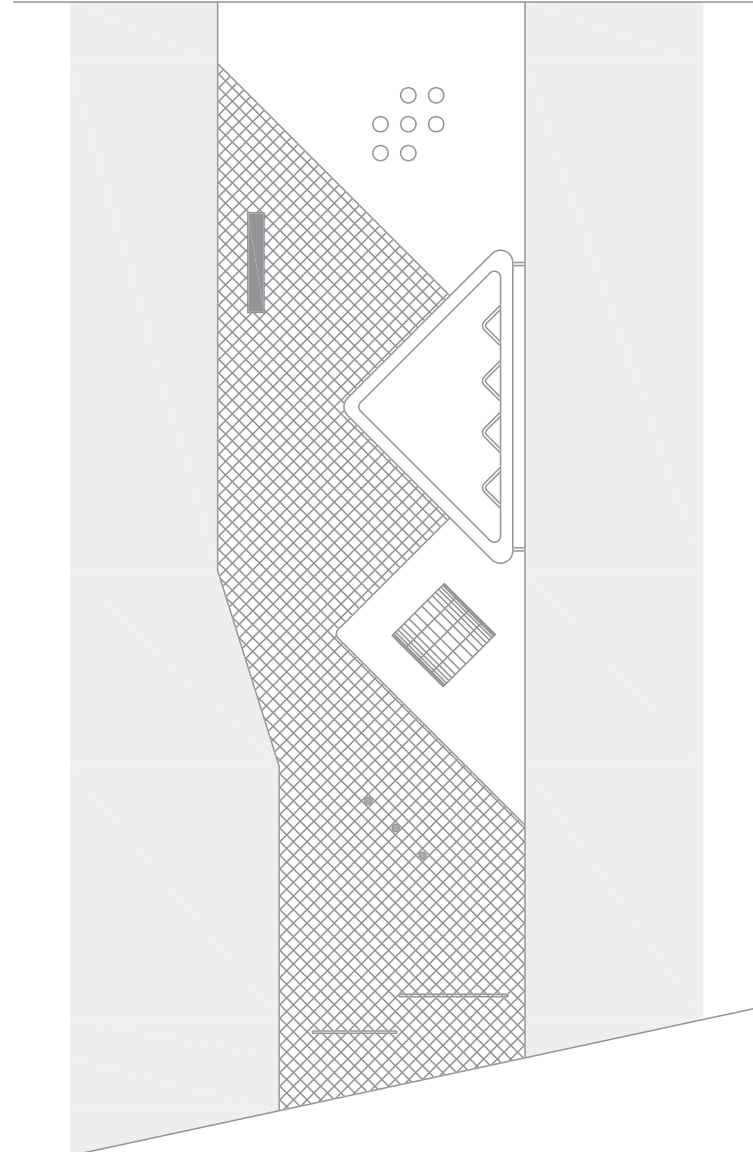


## Aldo Van Eyck

Van Eyck's playgrounds in Amsterdam utilize the child's imagination in the creation of a world of fictional play from simple objects. He allows children to make up their own games when playing with his cylindrical concrete pads or pylons and sand pits.



### Precedent Studies



Plan for Dijkstraat playground designed by Van Eyck



Sketch of Van Eyck's Dijkstraat playground in Amsterdam

Van Eyck also wrote on his ideas about the child in the city. In speaking about cities, he states,  
"If they are not meant for children, they are not meant for citizens either. If they are not meant for citizens - ourselves - they are not cities."  
- A. Van Eyck, *The Child the City and the Artist* p.310

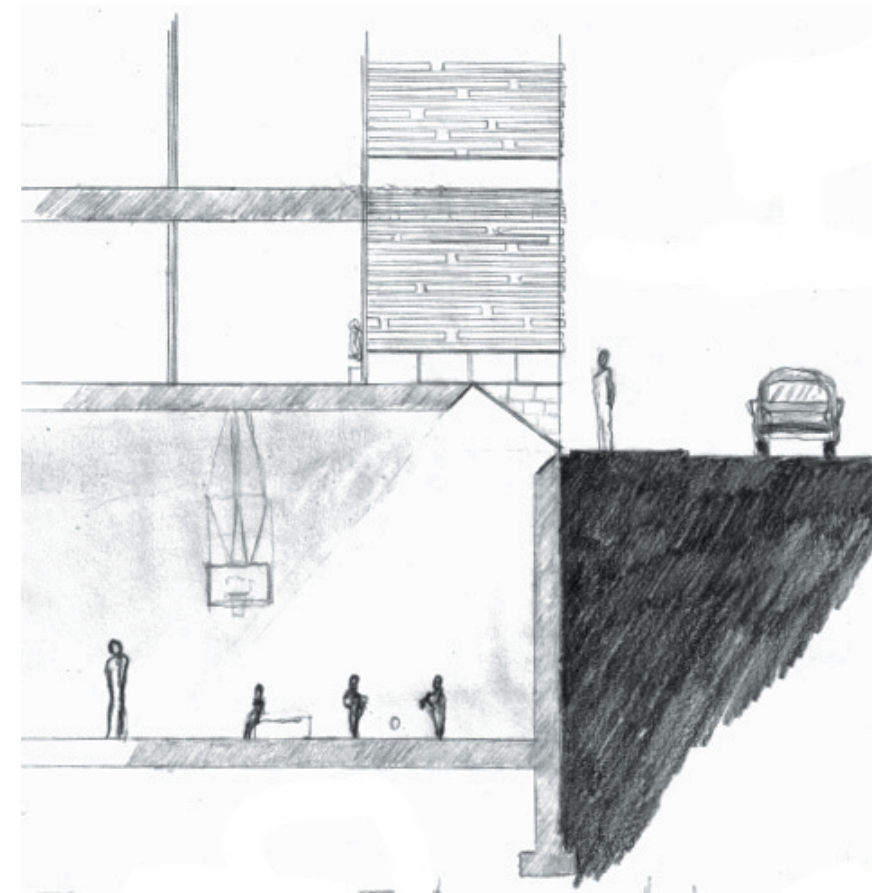
In the preliminary design ideas for the school, emphasis was placed on making the presence of the child apparent to the larger community.

In this design for a classroom, the children hang their coats and backpacks along a recessed window, so they are visible from the street. The facade of the school is glazed but on the inside lined with wooden slats that are pulled apart creating spaces for children to display work. Also important in this design were the windows looking down into activity spaces sunken below grade.



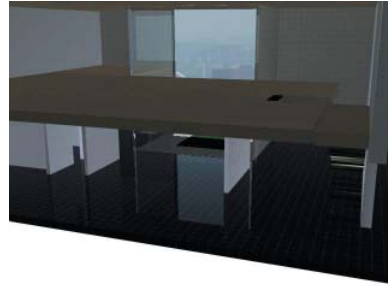
This proposition on learning begins with the individual. Learning is a very personal process, thus, a place for education should foster the individual. In attending to the needs of the individual the school should also be simple and easily navigable to promote comfort and security.

Learning should take place at many different scales of interaction; at the scale of the individual, in private spaces within a classroom; at the scale of small groups, within the classroom and other gathering spaces in the school; and at the scale of the community, in spaces that allow for the gathering of many people from various places within the city. Many are involved in educating a single individual and that should be acknowledged in a place for learning. For this reason, the school should reach out to the community so that there is a permeable relationship between the school and its surroundings.

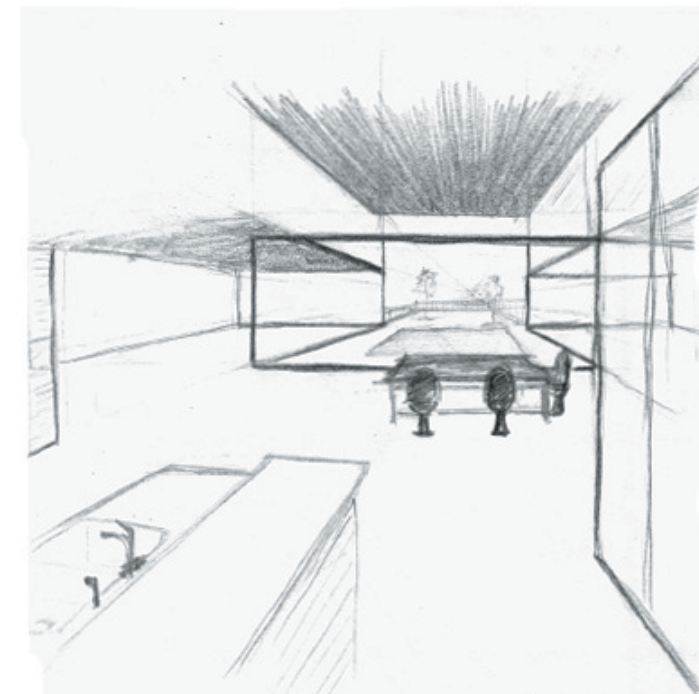
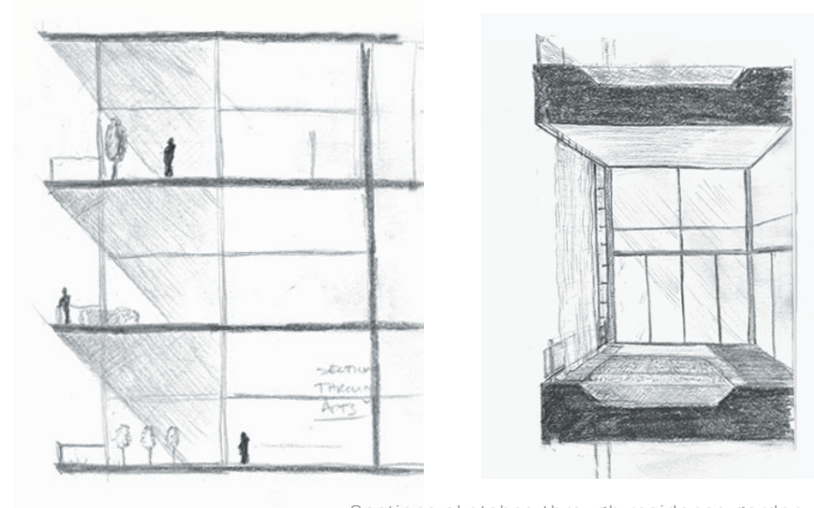
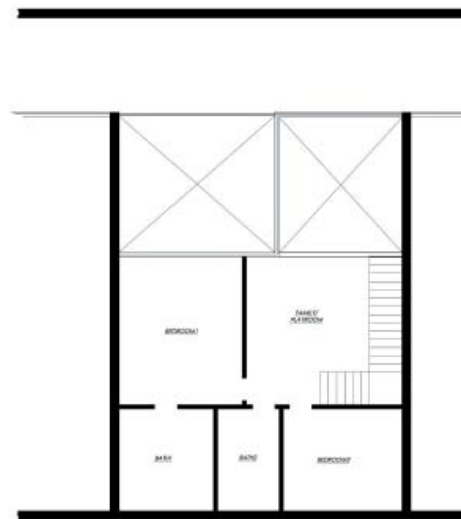
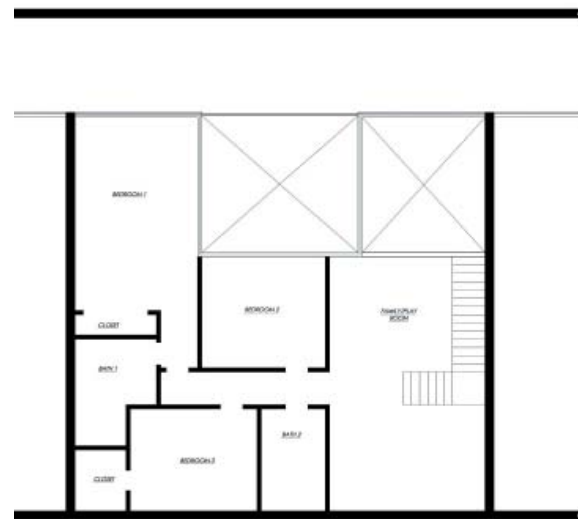
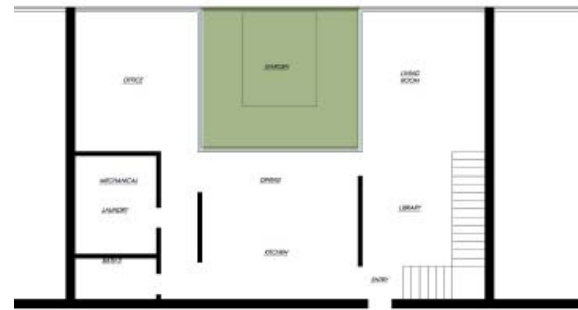


**Proposition on Learning**

The previous studies, along with preliminary design ideas, lead to the formation of propositions on both learning and dwelling in the city.



The idea of an urban yard for the family became important as the proposition for dwelling in the city developed. The open plan envelopes the garden as a room in itself and brings the outside into the home.



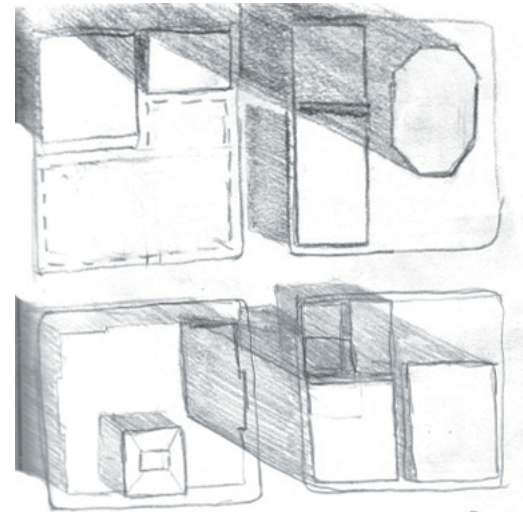
The proposition on dwelling considers the expectations of a house. In a house we seek refuge and a place of our own, separated from the rest of the world. The house should be simple and easily understood, allowing reflection upon experiences from the outside world. It should be a place where one feels calm and secure. The center of the house is most important, it is necessary to have a spatial figure that orients one within the house. This is the space around which the rest of the house is organized.

A house must also offer a sense of personal identity; a private outdoor space adjacent to the home becomes a small piece of the world as one's own. The home should provide that sense of ownership. It is here that one returns after venturing out into the world and here that the sense of self is restored.

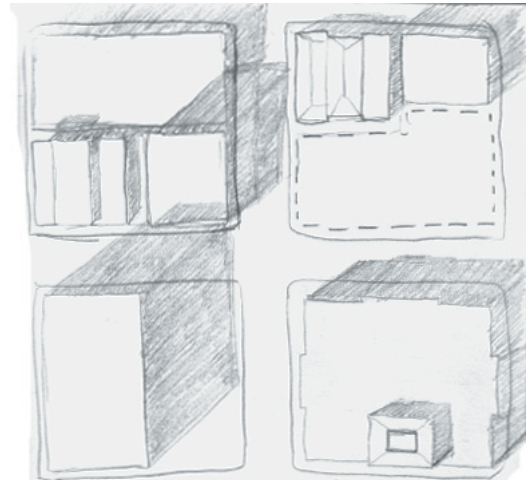
**Proposition on Dwelling**

Based on the idea of bringing the life of the school to the street, the roof of the school was utilized as an outdoor playspace. This required a certain amount of light available to the roof of the school and also the private garden terraces in the residence towers.

Several light studies were conducted on Dec 1, nearing the darkest days of the year, to determine the configuration of the towers in relation to one another and the school. While the site itself is not heavily shaded by surrounding buildings, the initial design proved unacceptable due to the shadows cast by the towers on each other for the duration of the day.

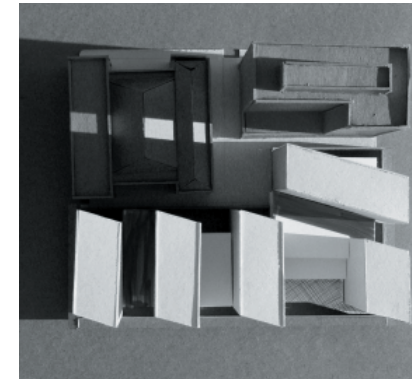


Morning shadows on site

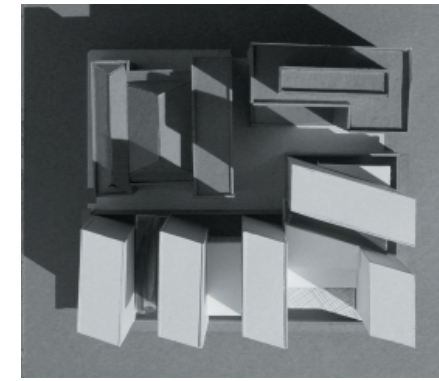


Evening shadows on site

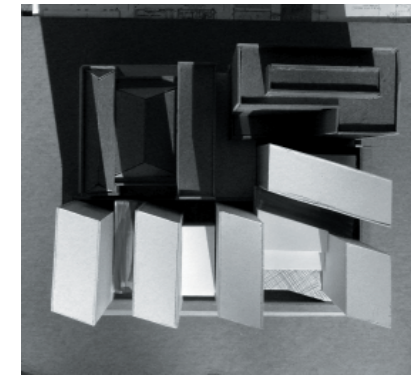
**Light Studies**



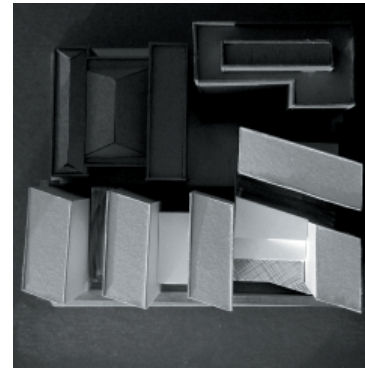
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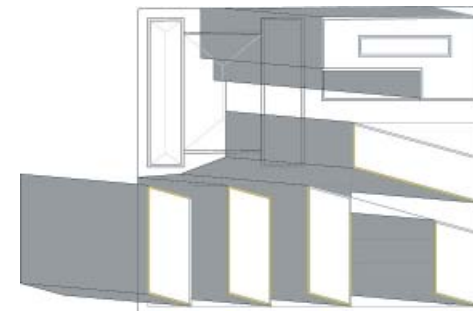
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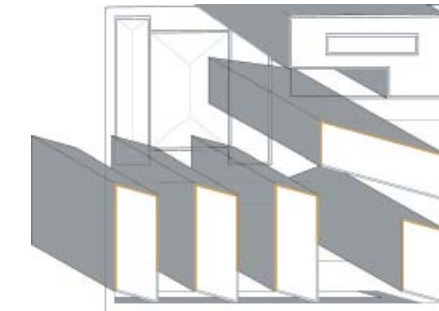
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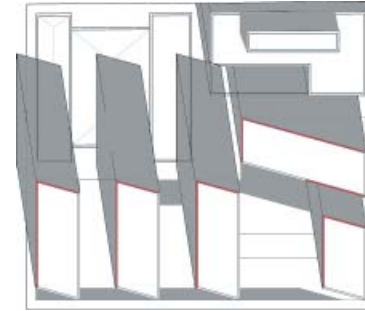
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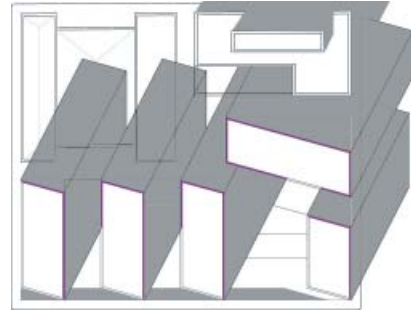
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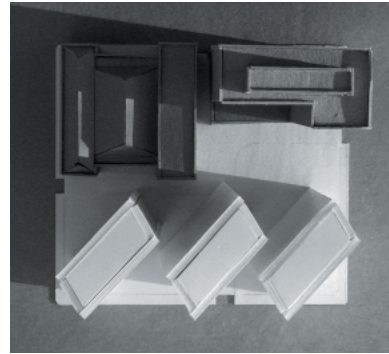
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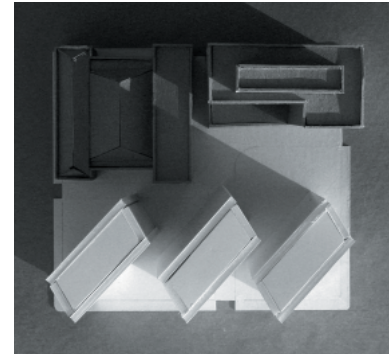
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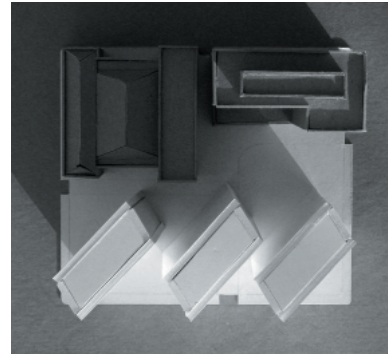
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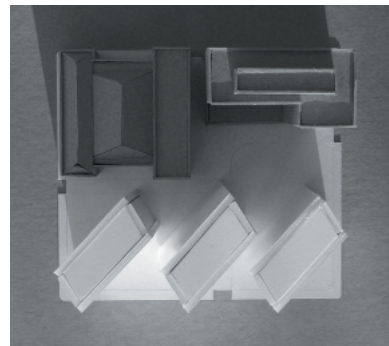
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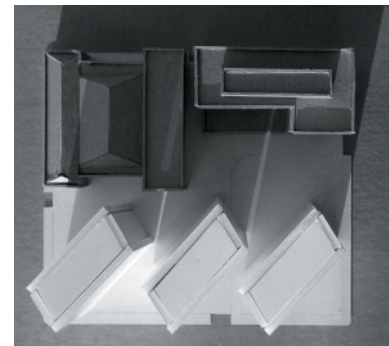
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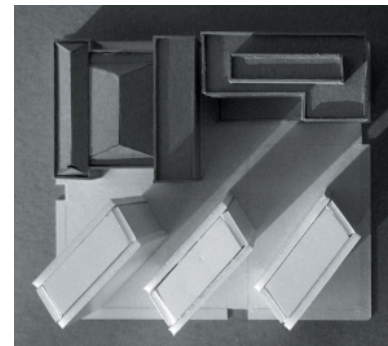
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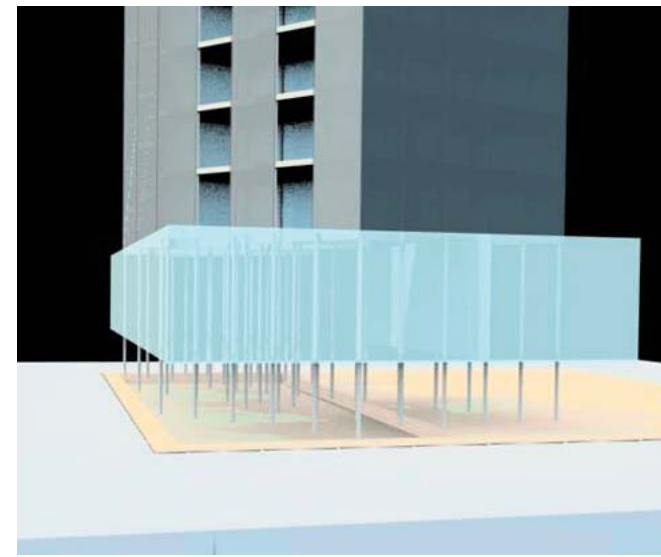
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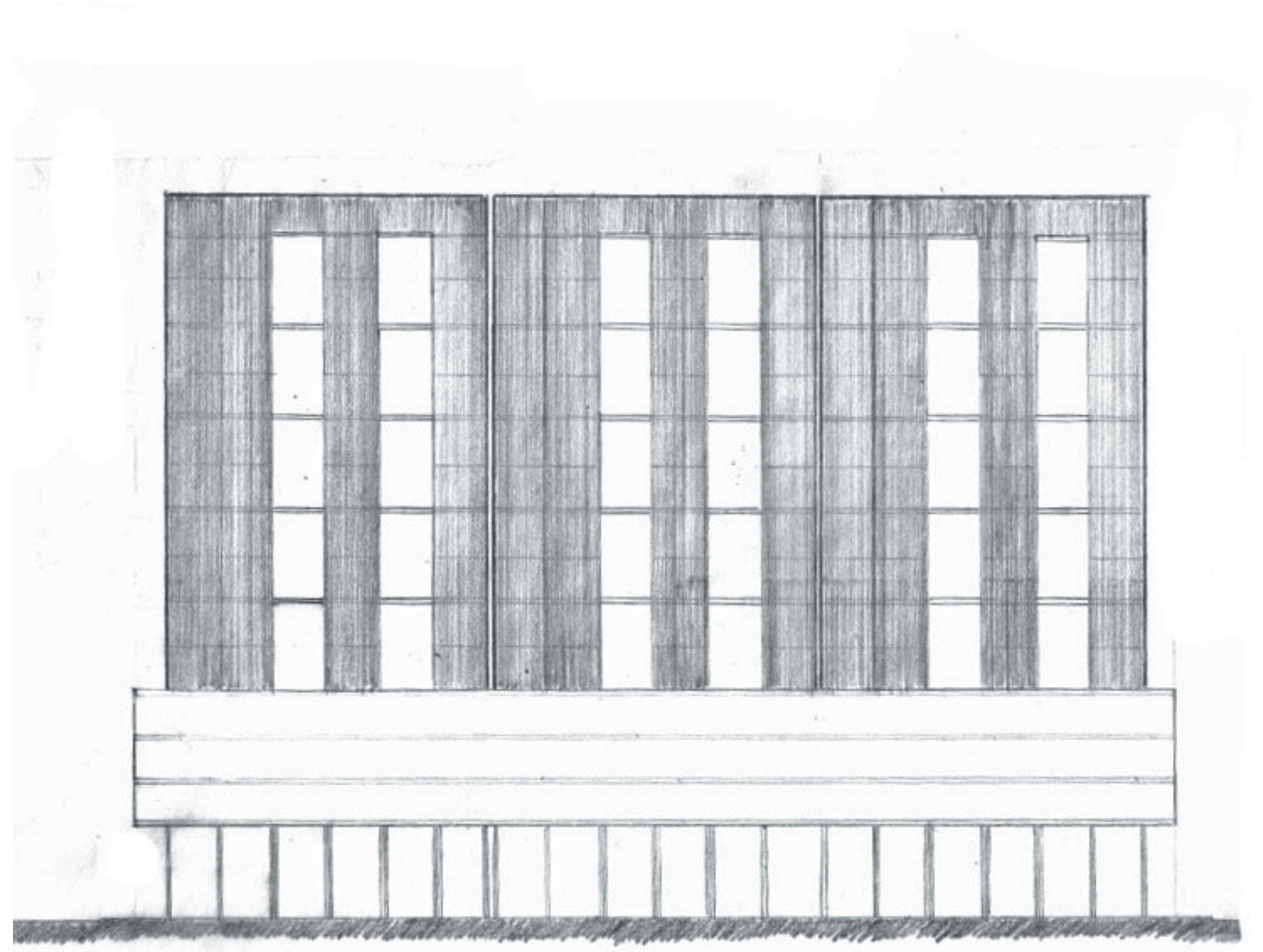
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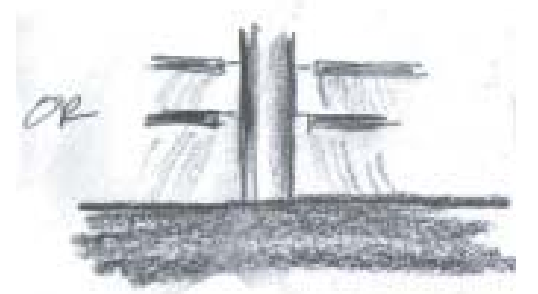
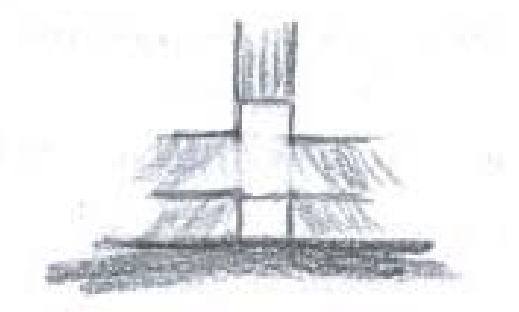
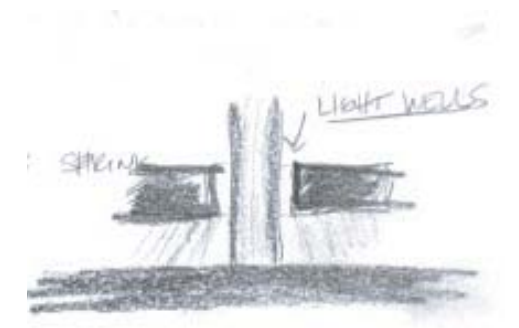
In the next design iteration the sunlight was maximized by orienting the shorter walls of the tower in the direction of the North-South axis, which in St. Louis is not orthogonal to the street grid. The resulting configuration for the residential towers became skewed parallelograms in order to let enough light to each garden without shading one another for an extended period of the day.

Along with this new tower configuration, the school was elevated from the ground level to accentuate the contrast between it and the vertical tower elements.

**Light Studies**



Elevation of revised design for towers and school



It became critical to determine how these two main elements of the building come together. This involved several different explorations of the word “joint” and the contrasting structural systems of the school and residences.

It was important that the meeting of the two pieces of the building benefitted both programs. The sketches at the left represent some of the initial ideas on how that could be achieved.

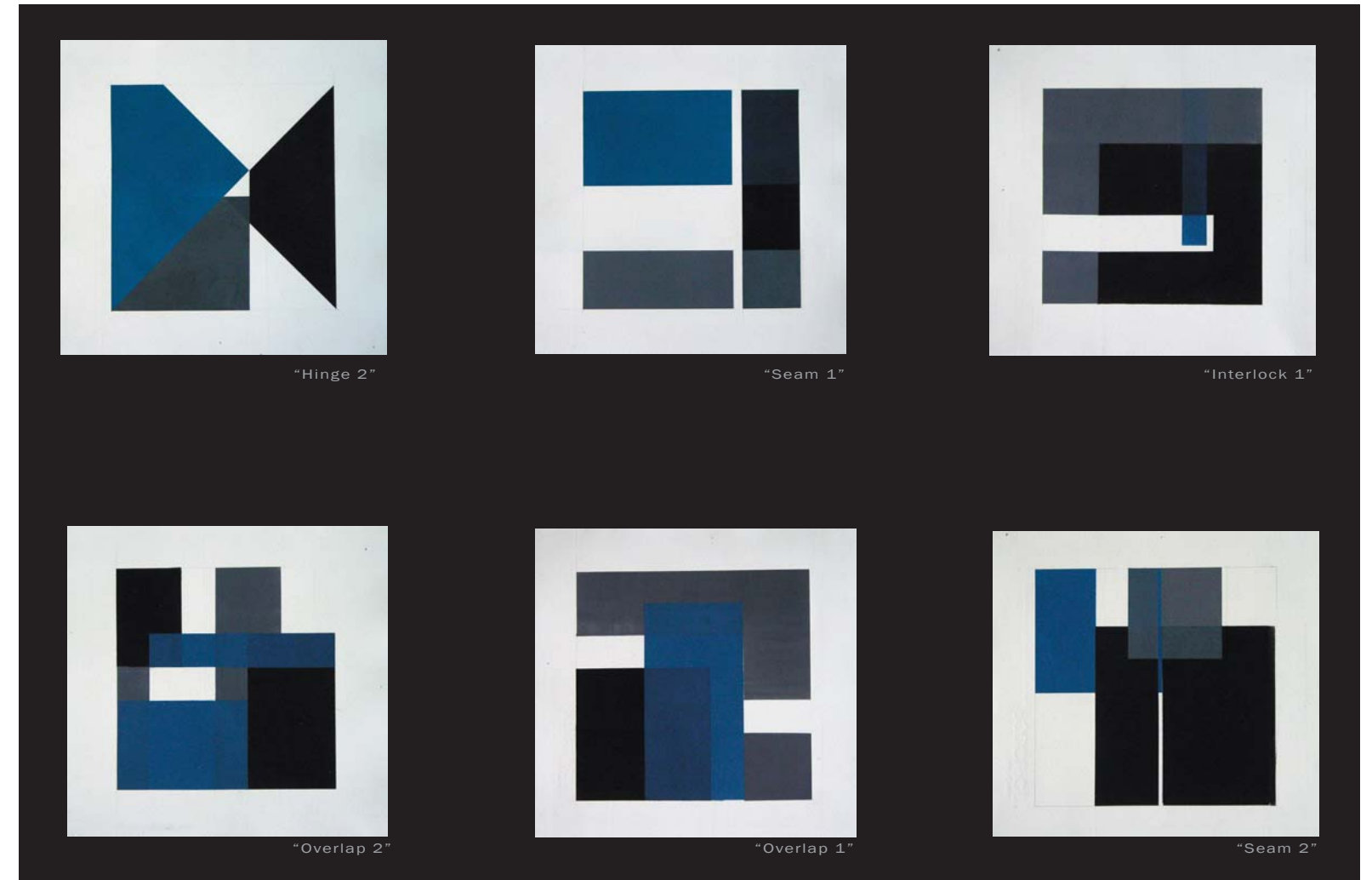
**Joint Studies**

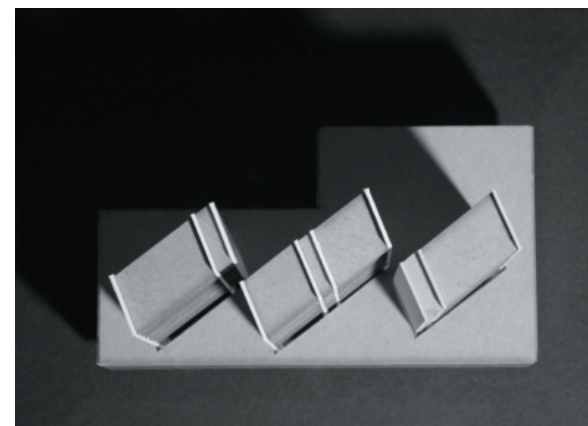
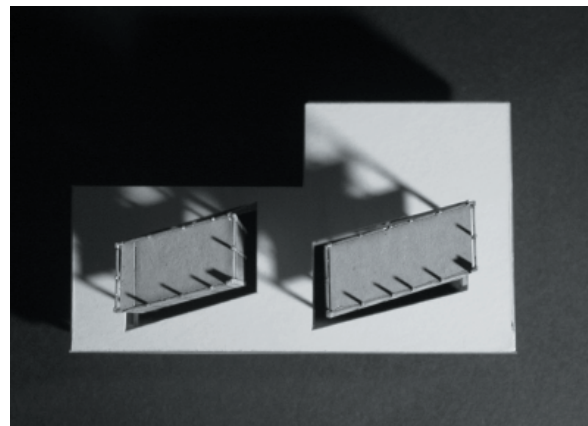
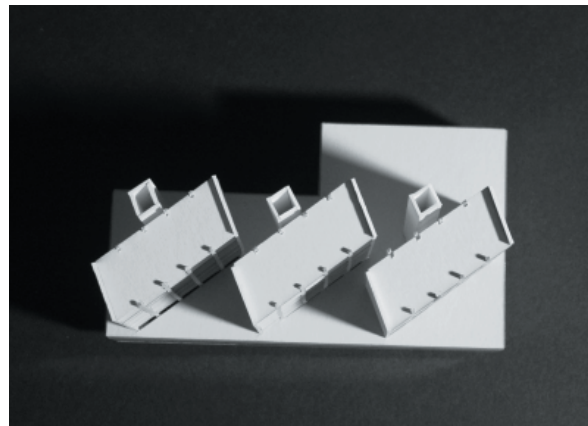
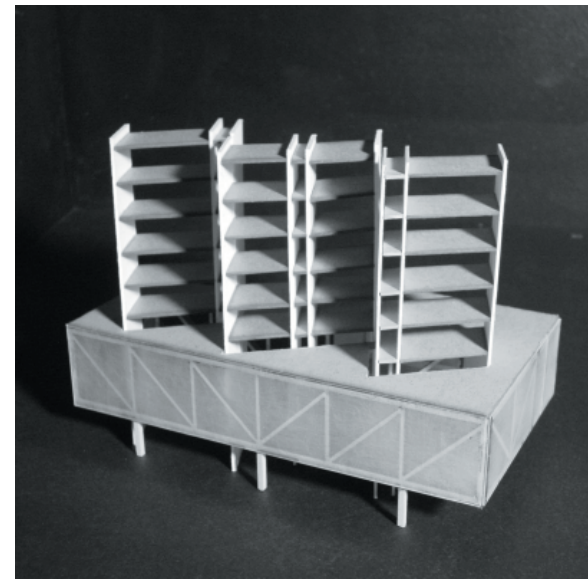
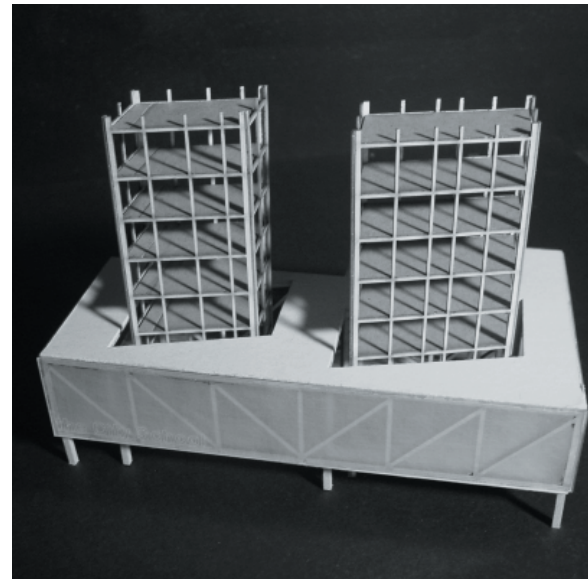
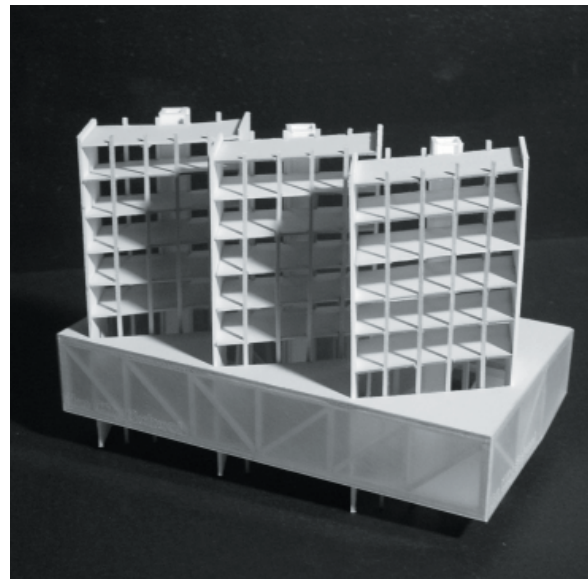
The idea of the “joint” was also the subject of a graphic study of various words for joint and different types of joining.

This study helped to abstract the problem and shed new light on the potential relationship of the two parts of the building.



Joint Studies





As the two programs developed the strongest idea had to do with how the two addressed their connection to the outside. In the residences the outside was brought in to the home with the use of the garden, in the school the inside was brought out by emphasizing the presence of the child on the street. As these two contrasting ideas became more important to the project, the two elements of the building, the strong verticality of the residences and the horizontality of the school, grew in greater contrast to each other.

This study explored the structural interaction of the two parts of the building and how they contrasted with one another.

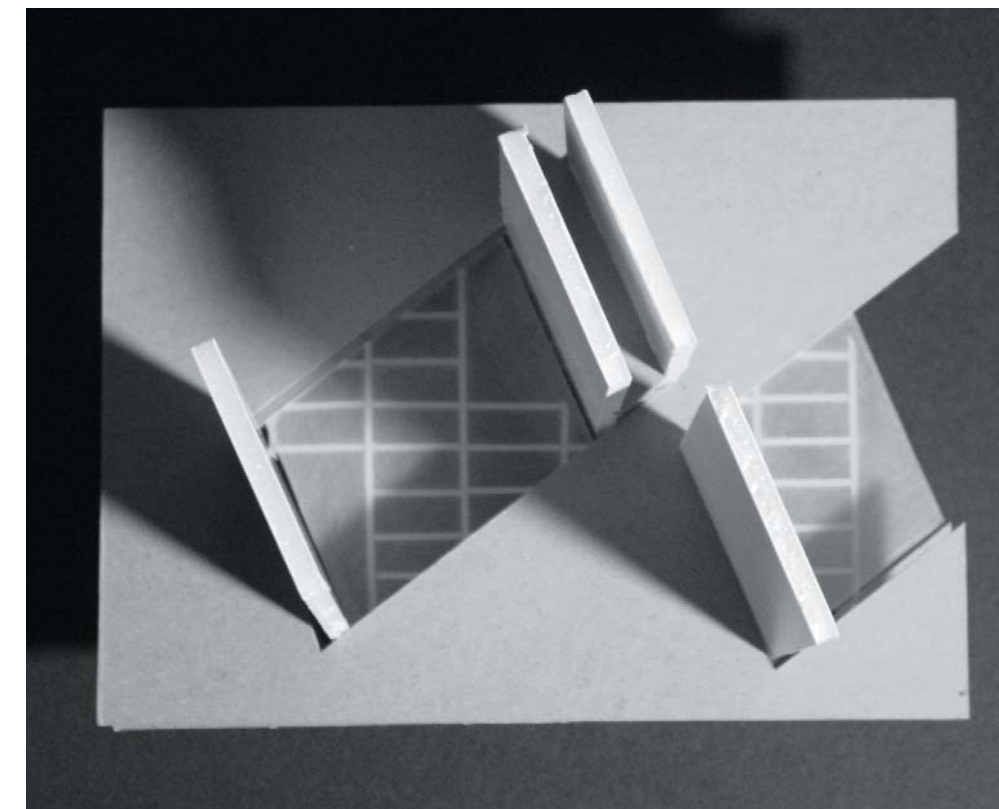
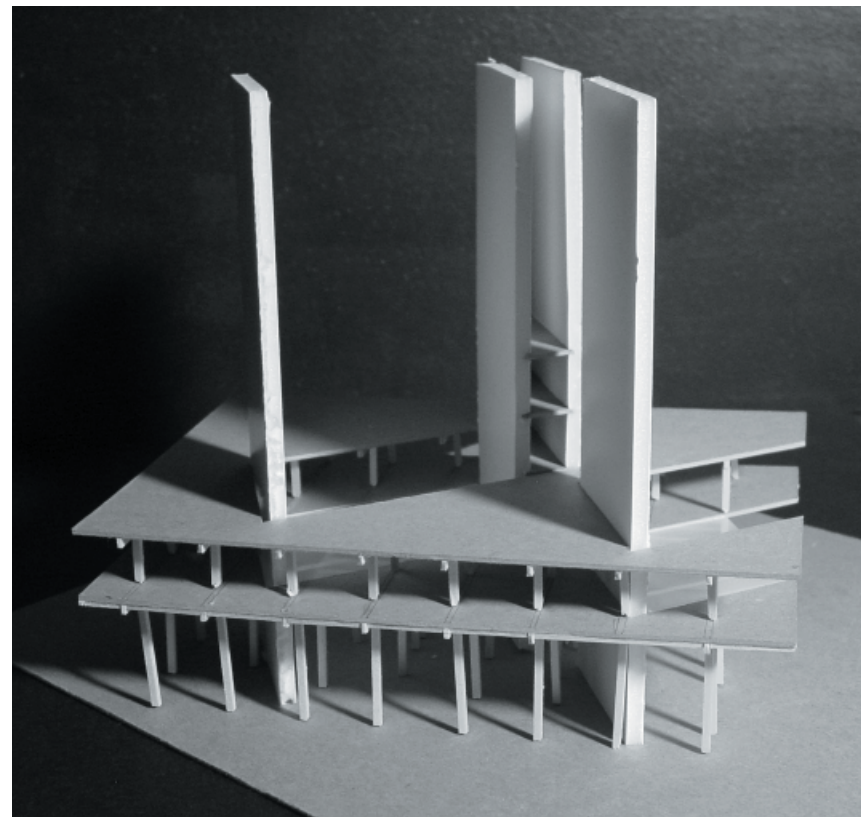
**Structure Studies**



The structure for the residences developed first as large concrete bearing walls that pierced the school volume and were anchored to the plaza.

This move allowed the creation of a circulation core in each of the towers that also incorporated the mechanical shaft for both the residences and the school.

From these studies it was determined that the towers would cut through the school and form atriums lighted by clerestory windows that were created by pulling the first residence a full story above the roof of the school.

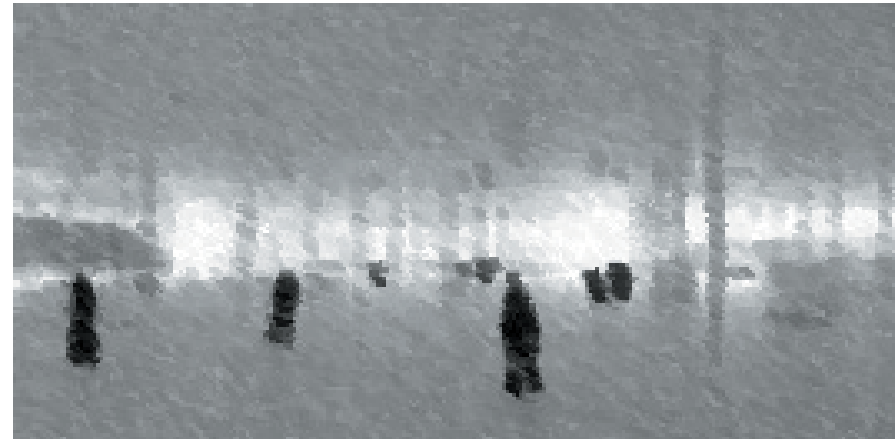


This move, combined with the fact that the school is elevated above the ground, made it more difficult to design the structural system for the school. Initially a steel structure was used in contrast to the concrete bearing walls of the residences. The rigidity of the structure, however, did not allow enough freedom for the placement of the columns, or the angular geometry of the towers as they cut through the school as atriums. The final structure of the school consists of concrete slab and column construction which allows for free placement of the columns creating a unique environment on the plaza level.

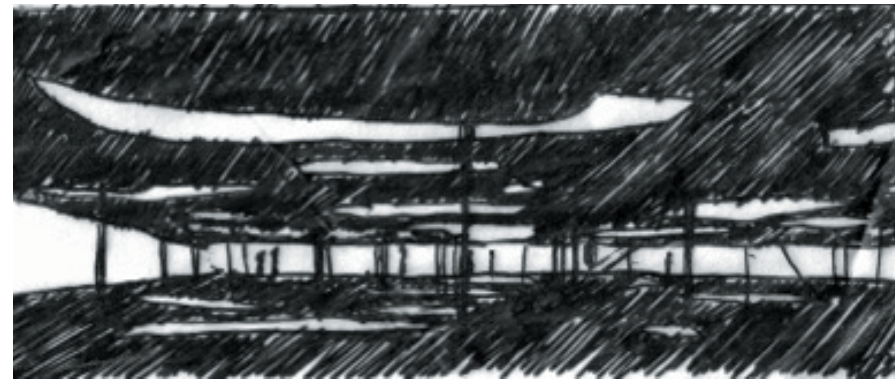
## Structure Studies

The plaza level is important for several reasons. This is where the two structural systems meet and also the part of the building that is a key element of bringing the school to the street. This gathering space allows for more perceived transparency between the school and the street; bringing the community to the school without bringing them inside the school and bringing the children to the street without actually being on the street.

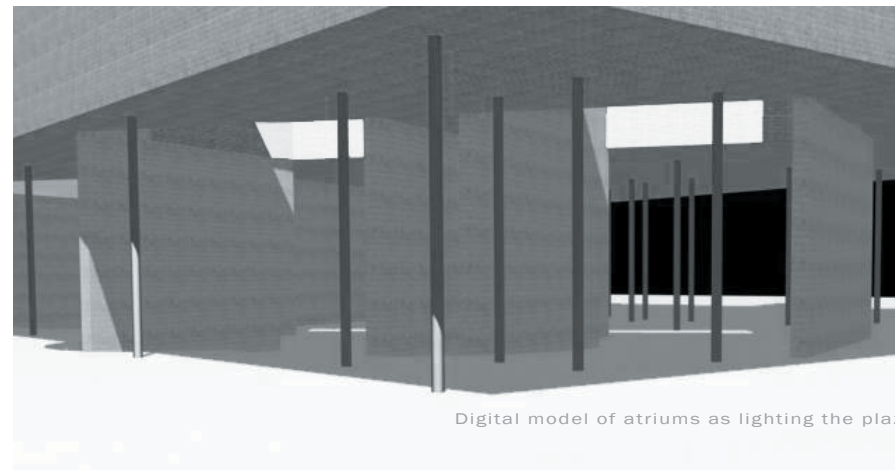
It is important to keep this space well lit, both during the day and at night both for safety reasons and for the experiential qualities of the plaza. The plaza should be like a room of the city; giving the space back to the street.



Sketch of Naoshima Ferry Terminal by Ryue Nishizawa, Kochi, Japan

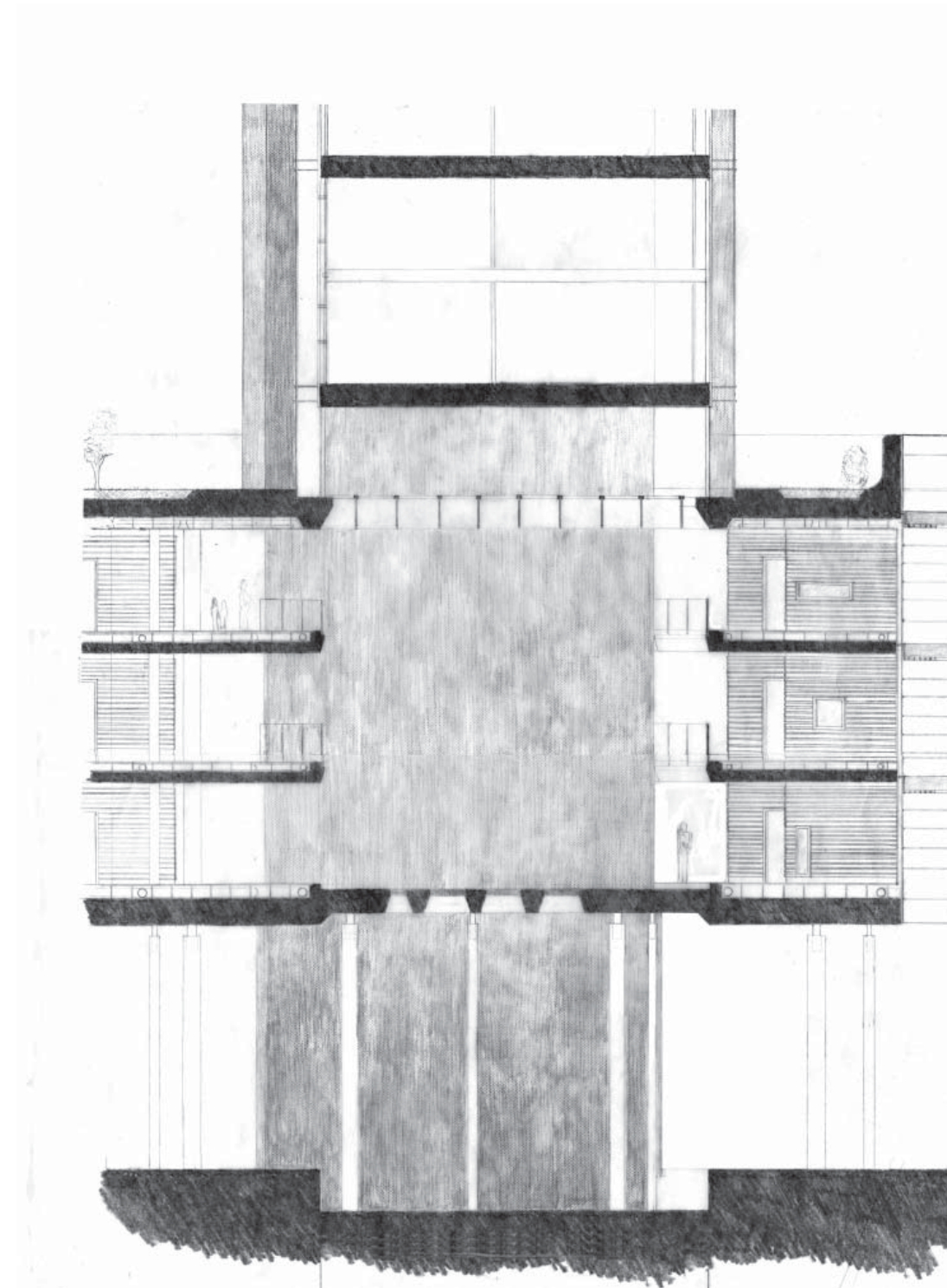


Sketch of Eda Apartments by Ryue Nishizawa, Yokohama, Japan



Digital model of atriums as lighting the plaza

## Role of the Column

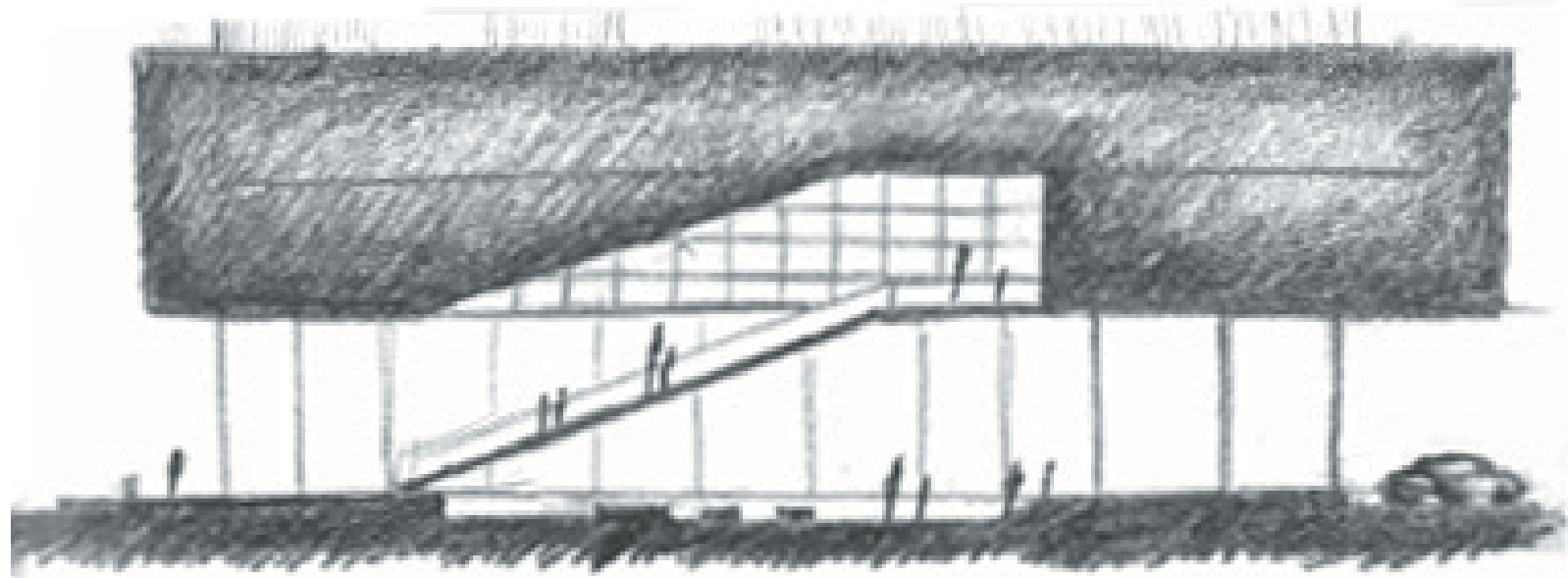


Section through school atrium

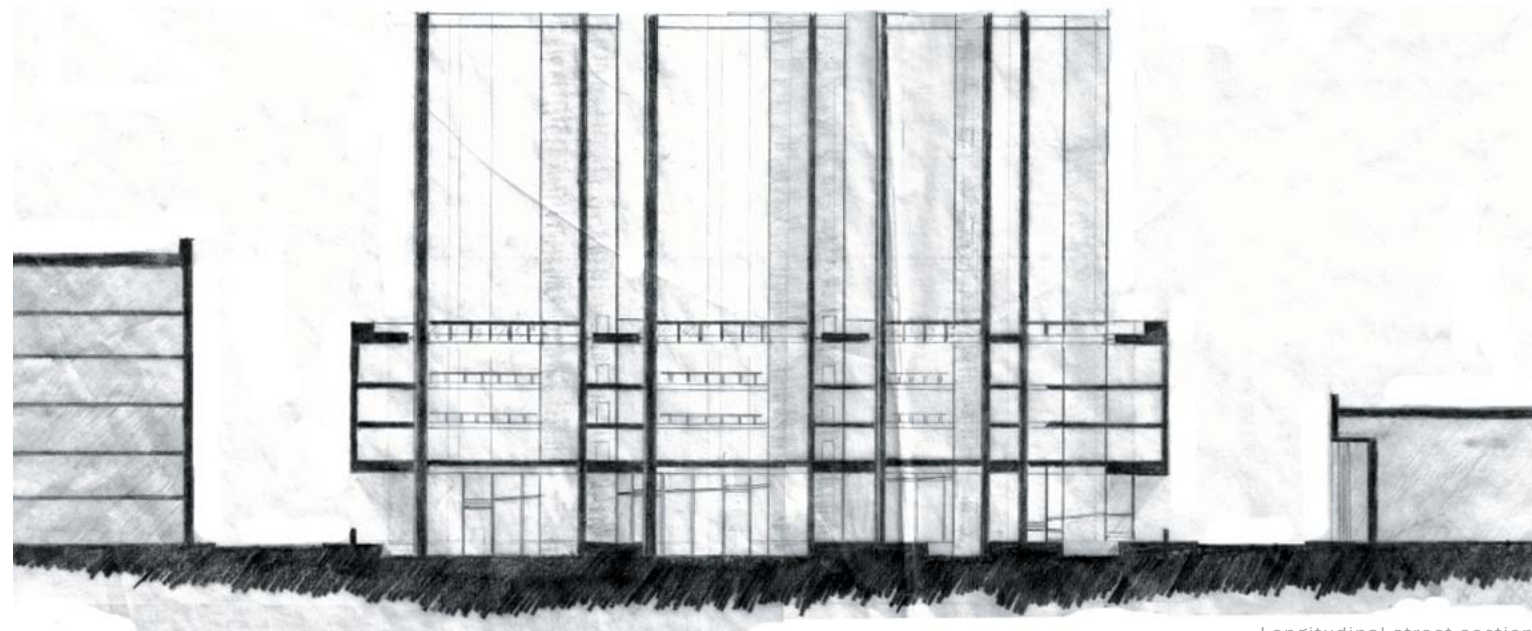
The atrium spaces play an important role in the lighting of the plaza level. In the floor of the atrium spaces, glass blocks in-laid in the concrete slab allow light to filter through to the plaza below.

Another source of light comes from the separation of the school from the bearing walls. Where the bearing walls of the towers pierce the school slabs, the walls are pulled away and a seam of light from the school washes the walls as they enter the plaza.

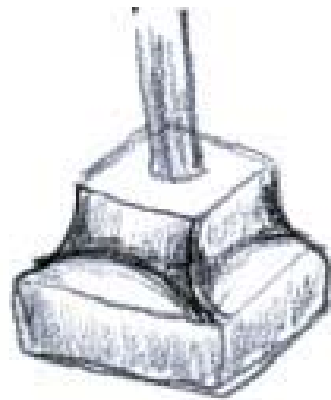
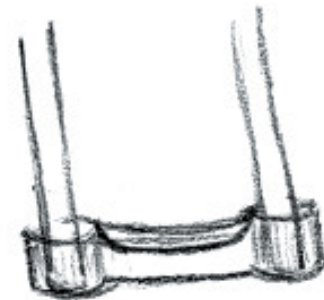
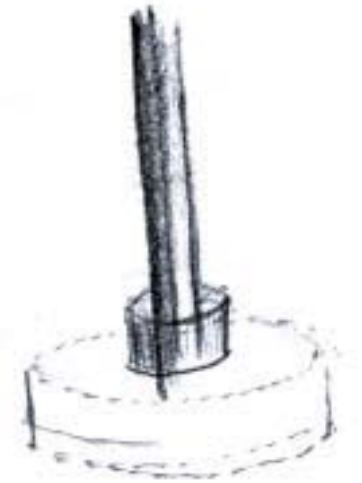
The columns are another key part of the plaza space. Their non-uniform arrangement and varying sizes create a forest-like effect. This is important in the creation of a imaginative place for the children of the school to play. The spaces beneath the atriums are sunken and filled with simple concrete objects that also stimulate creativity through play.



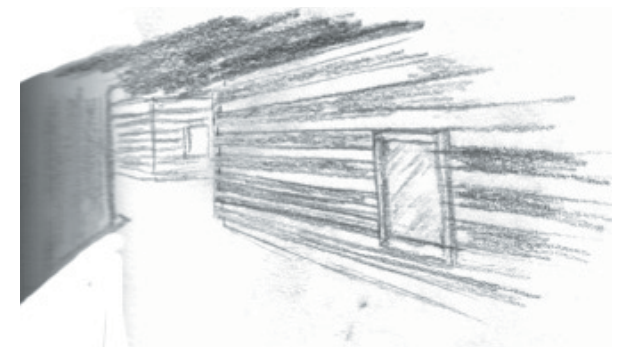
Section through elevated school



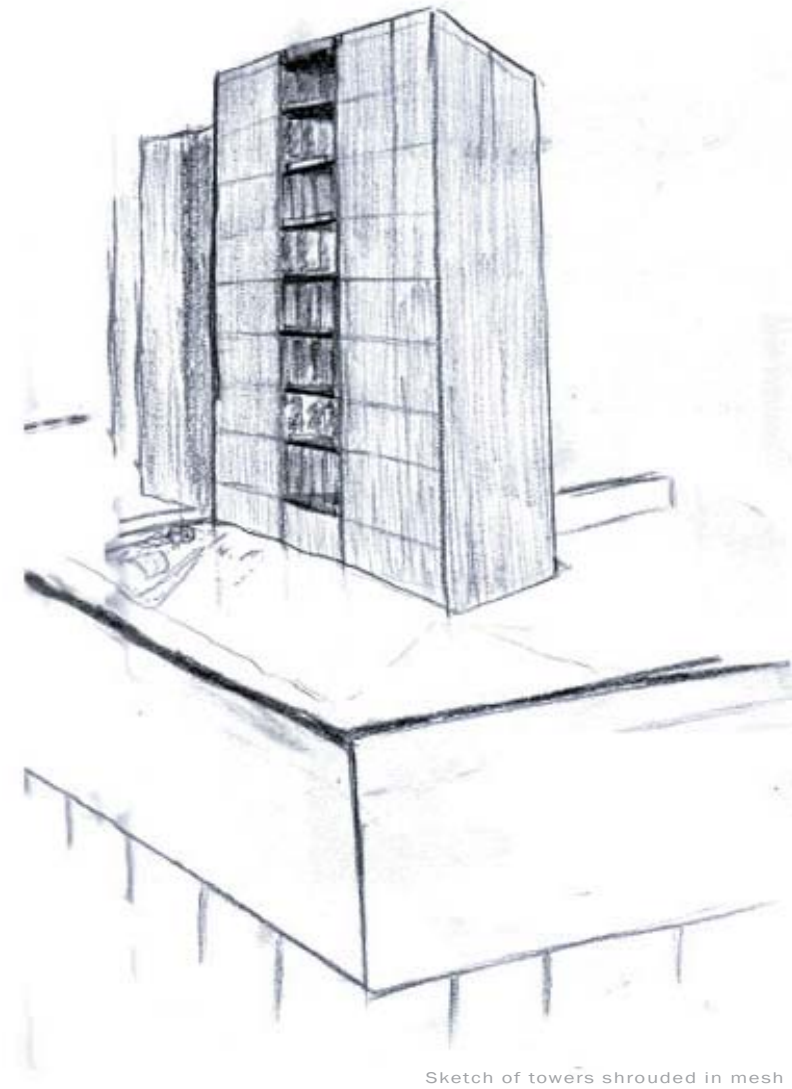
Longitudinal street section



The arrangement of the columns was determined in part by structural needs but more importantly, by the role of the columns in the classroom. As a way to give the children a connection to the structure of the school the columns form play spaces for the individual in each classroom. This move further emphasizes the importance of the scales of learning in the classroom. At the columns built-in furniture forms seats, benches, study carrols, and other places for imaginative play. Each classroom is distinct from every other in the way that these spaces are formed. The classrooms also gain identity from a translucent window of different colored glass in the walls of each classroom.



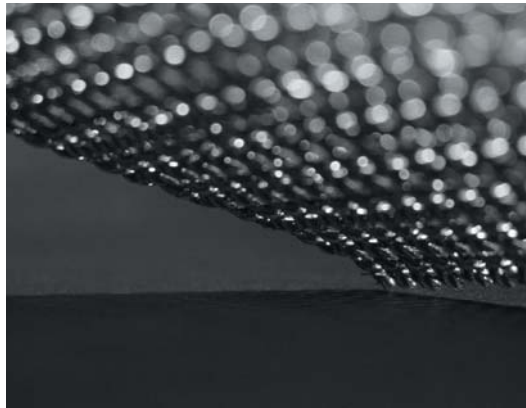
Role of the Column



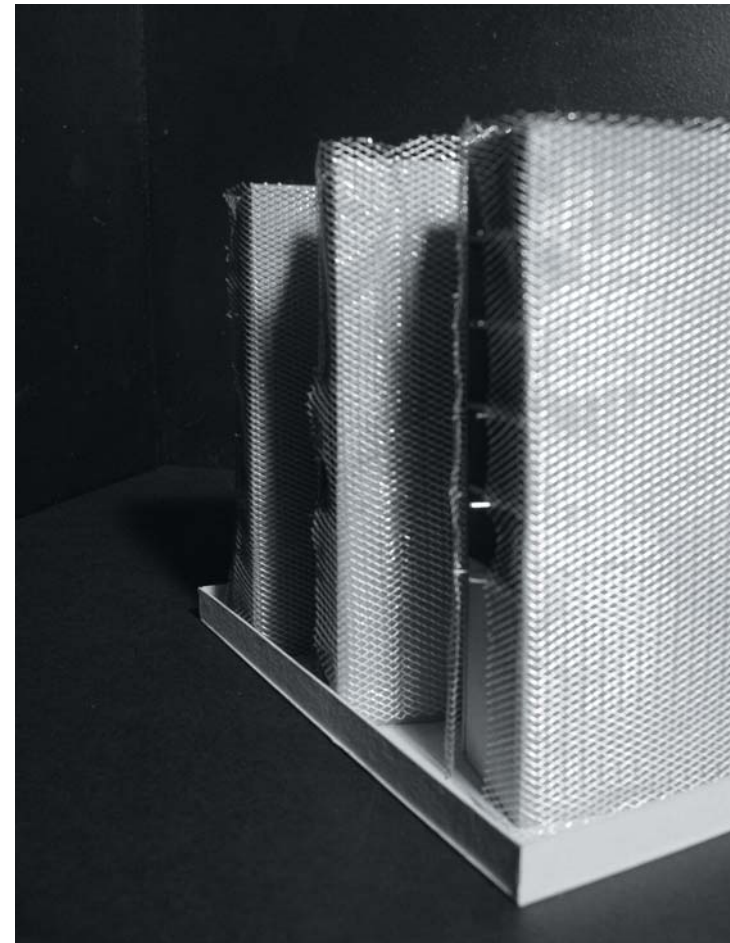
Sketch of towers shrouded in mesh



Study of view through screen



Mesh study



Towers with mesh cloak

With the garden as the center of the residences, it became the gateway to the outside world for the dwellings. As the connection to the outdoors, it was essential to make the garden unique from the rest of the openings in the residence. By cloaking the towers in a metal fabric, it also allowed for a perceived solidity from afar, grounding the towers in contrast to the floating school. The mesh would still allow light into each dwelling and views through thick window openings that appear as black and white photographs framed on the wall. This move contrasts the transparency in the garden space making it stand uniquely alone as the connection to outdoors.

## Residence Tower Facade