

Sub**Urban** Highrise

# Suburban Highrise

By

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

Master of Architecture

Approved:

Kay Edge, Co-Chair

William Galloway, Co-Chair

James Jones

## Abstract

Urban homes are vertical. Suburban homes are horizontal. They are two distinct typologies. Both urban and suburban homes relate to their location, vertical like the city, and horizontal like the suburbs.

These homes are very recognizable in the American landscape. Suburban homes are 1-2 stories with a garage, a yard, and tree-lined streets. Urban homes are many apartments stacked on top of each other within a single building, each with a small balcony and a parking garage underneath.

What about the in between? What happens in the spaces that are not quite urban, and yet not quite suburban? So many people live in these spaces today. They want the excitement and jobs the city offers, but they also want the comfort and space of the suburbs, especially for their families.

This building is a response to those spaces, a building that is urban, but is also suburban.

## List of Images

1. Suburbia  
[www.wikipedia.org](http://www.wikipedia.org), David Shankbone, photographer
2. Suburbia  
[www.solarroadways.com](http://www.solarroadways.com)
3. Detached House  
<http://www.bdwalshproperties.ie/property-in/Dromod>
4. Small Single Family Home  
[http://upload.wikimedia.org/wikipedia/commons/b/bc/Small\\_Single-family\\_home.jpg](http://upload.wikimedia.org/wikipedia/commons/b/bc/Small_Single-family_home.jpg)
5. Editt Tower  
<http://www.trhamzahyeang.com/project/skyscrapers/ed1.htm>
6. Elephant & Castle Eco Tower  
<http://www.trhamzahyeang.com/project/skyscrapers/ele1.htm>
7. 2 World Trade Center typical floor plan  
[http://www.arneault.com/travelpix/2001\\_wtc/wtc-aol/](http://www.arneault.com/travelpix/2001_wtc/wtc-aol/)
8. 5th floor plan  
<http://www.carloft.de/v0/htdocs/index.php>
9. Apartment floor plan  
<http://www.prudentialelliman.com/Listings.aspx?ListingID=877818>

All other images created by the author.

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SubUrban Highrise

## Introduction

The thesis evolved from the basis of the spring 2007 Atelier Olgiati project (see appendix A). That project was developed as a response to the work of Malaysian architect Ken Yeang.

From that basis I began to explore what the building was really about. What are the elements that make up the building and when they are all put together, what do they create?

In the urban home movement is vertical. In the suburban home movement is horizontal.

In the city the car is driven up and down the floors of a parking garage, or moved floor to floor by an elevator. The person rides an elevator or takes the stairs up or down to enter or exit the apartment. There are rooftop terraces, or small balcony gardens.

In the suburbs the car is driven around the winding streets of developments and parked in a driveway or garage. The person walks from room to room, in and out doors to enter or exit their home. There are lawns and gardens and trees surrounding estates.

Urban expansion is vertical. Suburban expansion is horizontal.

Urban expansion is creating skylines that are constantly growing taller and taller. The skyscrapers of yesterday pale in comparison to the mega-structures of today. Buildings are no longer just an apartment building or just an office building; they are multi-function, multi-use, cities within themselves.

Suburban expansion has overtaken countless acres of land. Communities of houses, some of which are gated, surround urban centers. Some of these developments do not even surround an urban center, they surround other suburban areas. "McMansions" and "big box stores" have become commonplace in what we tend to classify as suburban sprawl.

How can a family still have the features of the suburban or urban life they desire? Is the sprawl of suburbia the only answer?

In these ambiguous areas the line is blurred between the urban and suburban. This thesis is a response to the ambiguous space between the urban and suburban, specifically relating to the home to create an urban home that is suburban, and a suburban home that is urban.

“Much of U.S. settlement can be characterized as low density one- or two-storey buildings equally distributed on privately owned lots. This low-density pattern has proliferated, fueled by a view of the country as a land of open horizons with landscape to spare a belief in technologies, a reliance upon mass production, and abundance of wood, and economic policies that favor decentralized home ownership.” (Chow, p.139)



1. "Suburbia". David Shankbone, photographer

2. "Suburbia". Image from [www.solarroadways.com](http://www.solarroadways.com)





3. Detached house on Harbor Rd.



The 3 main elements of the suburban home:

the house

the yard

the driveway

These are the defining features of a typical suburban home. Driving down the street in any residential neighborhood this is what you will see, spread out horizontally over acres and acres.

There can be a fourth element as well, the garage. This can be its own element, such as a detached garage, or can be included as part of the house as an attached garage.

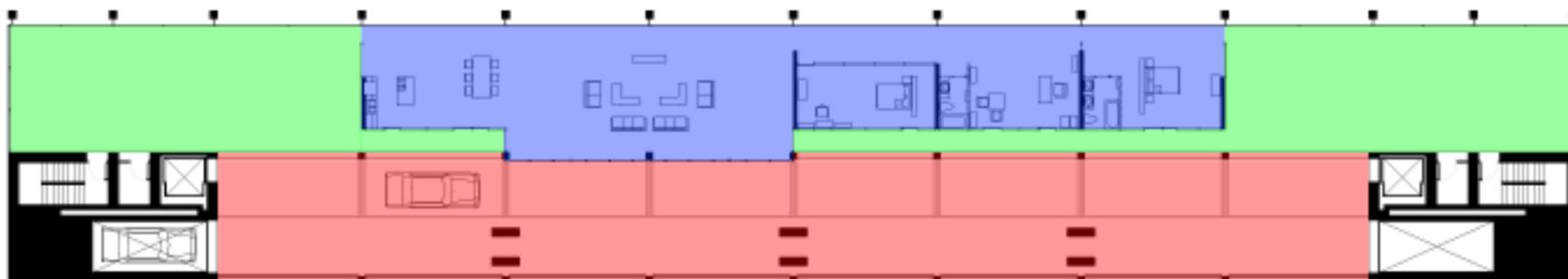
Each apartment floor of the building is a single family home with the same amenities you would find in any suburban housing development. So essentially, each floor is a housing lot, but instead of the lots being stacked side by side, they are stacked one on top of the other. This creates a situation where the line between suburban and urban is blurred by the use of suburban elements within an urban framework.

“Narrow lots, shallow lots, nonrectangular lots – the reordering of the subdivision at the lot level is now the normative way to achieve greater density.” (Chow, p.140)





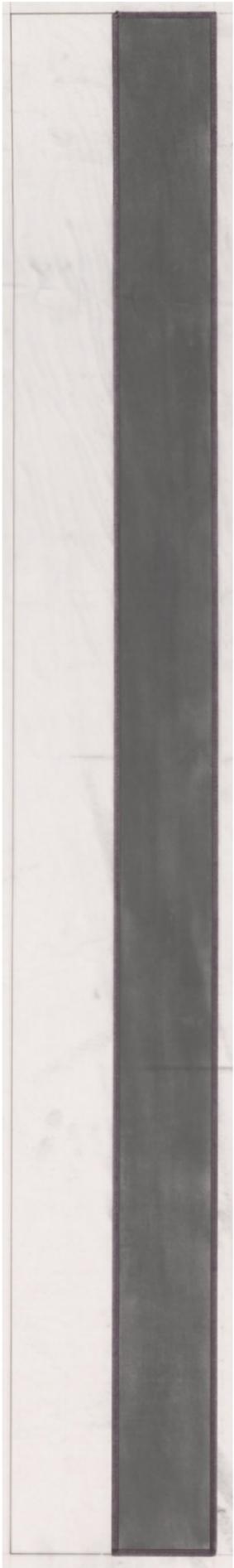
The home, the yard, and the driveway are shown in a suburban home and typical apartment level of the building.



The building itself is a dual use building. This is expressed with the structure and is visible on each floor. There is a space for people, and a space for cars. The structure needed to support cars is much different than what is needed to support just people. This led to the expression of the two different structures, one massive and one light.

The multiple people uses of the building also contributed to the overall design and look of the building. While the structure is expressed through the use of materials and mass, the occupant uses of the building are expressed through the separation of spaces using the structure.

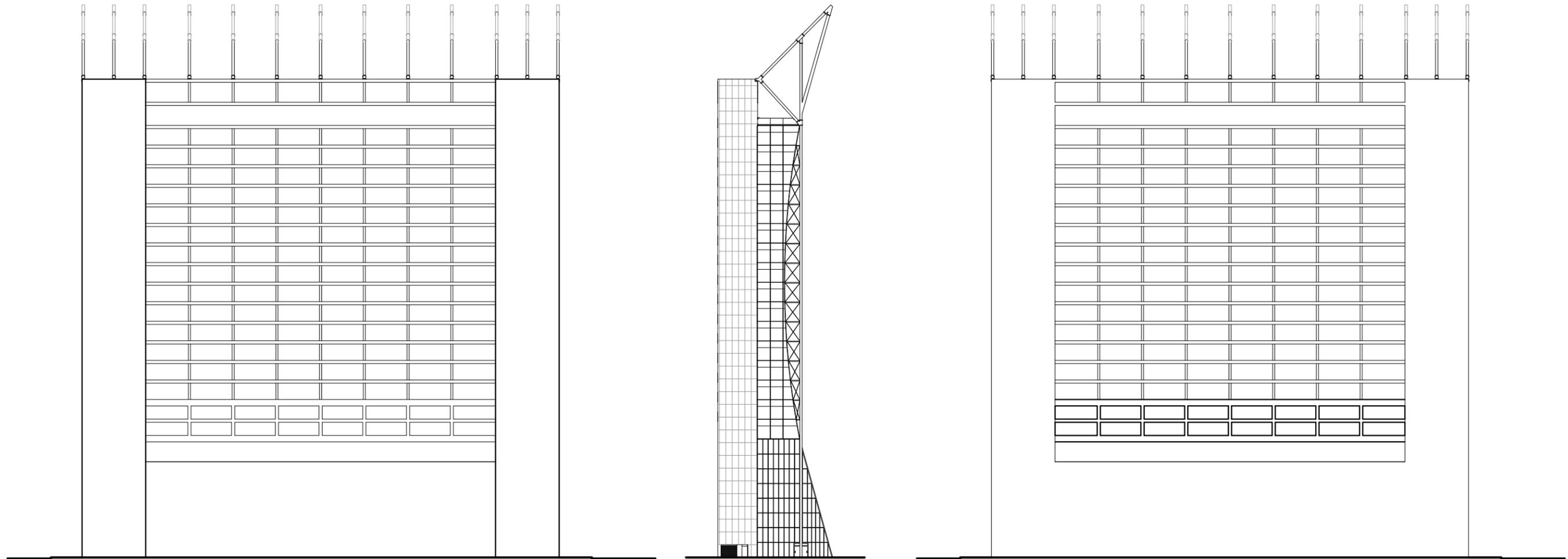
The mass of the structure needed for the cars also contributes to the separation of the occupant uses within the building.



## Main Structure Elements

End Cores

Main Spanning Truss

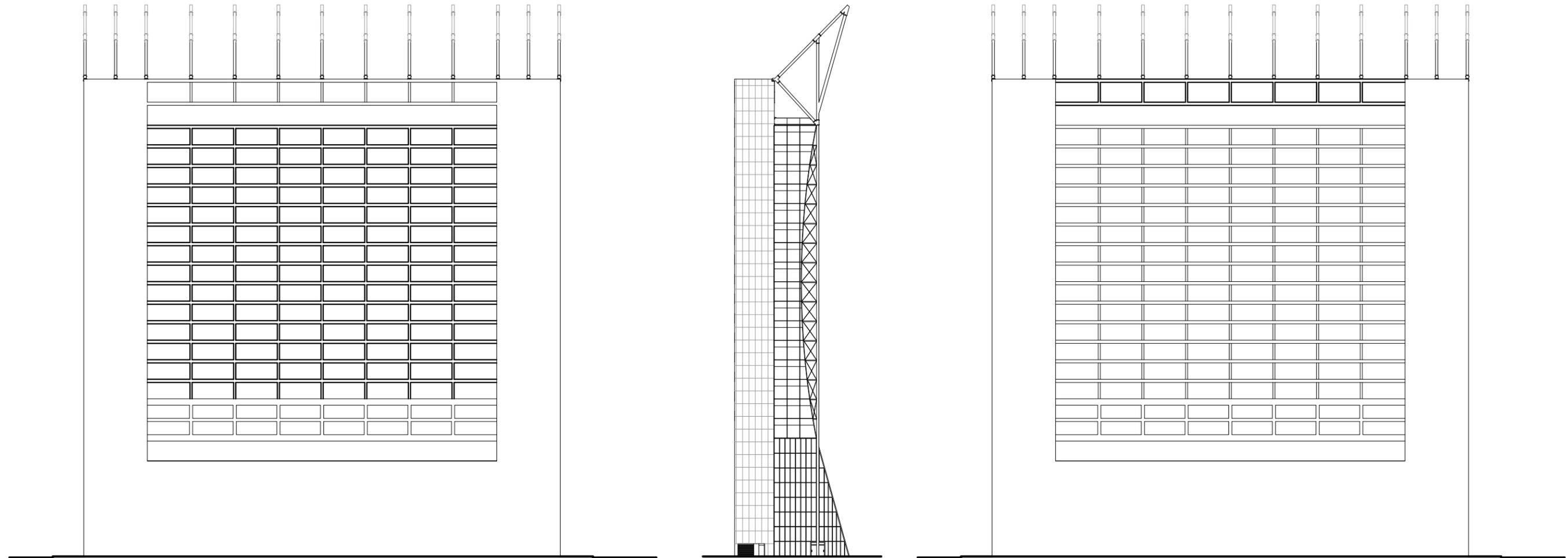


A large 2-story vierendeel truss carries the main load of the driveways. This truss allows the driveways to span freely between the two end cores.

# Main Structure Elements

Floor Trusses

Garden Spanning Truss

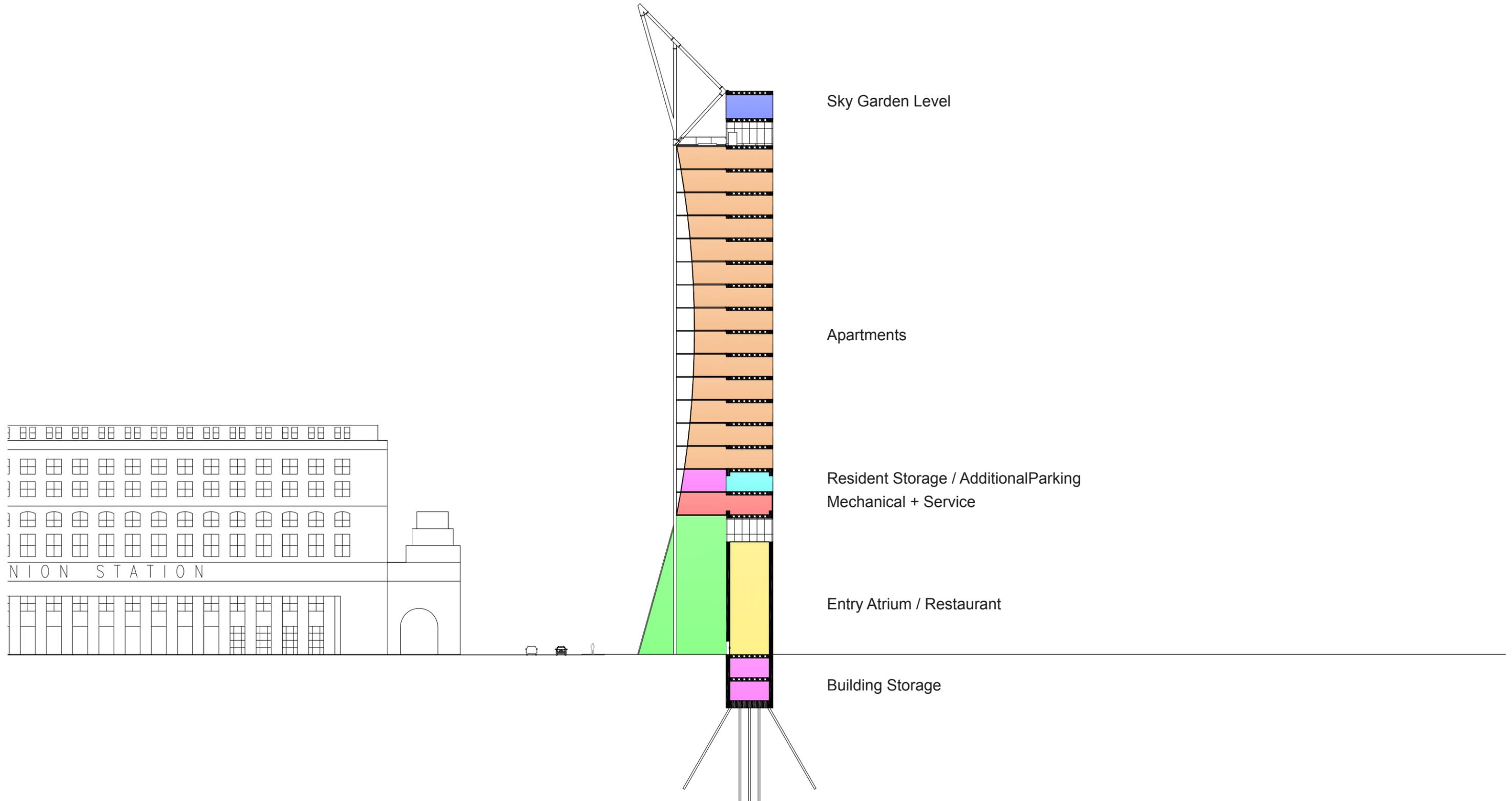


Each driveway floor of the apartment levels is its own truss. These trusses carry loads to the end cores or down to the large truss at the bottom.

The sky garden space at the top of the building is its own truss as well. It allows for the enclosed space to clearspan over the outdoor garden space.

# Diagram

## Building Uses



## Site Images

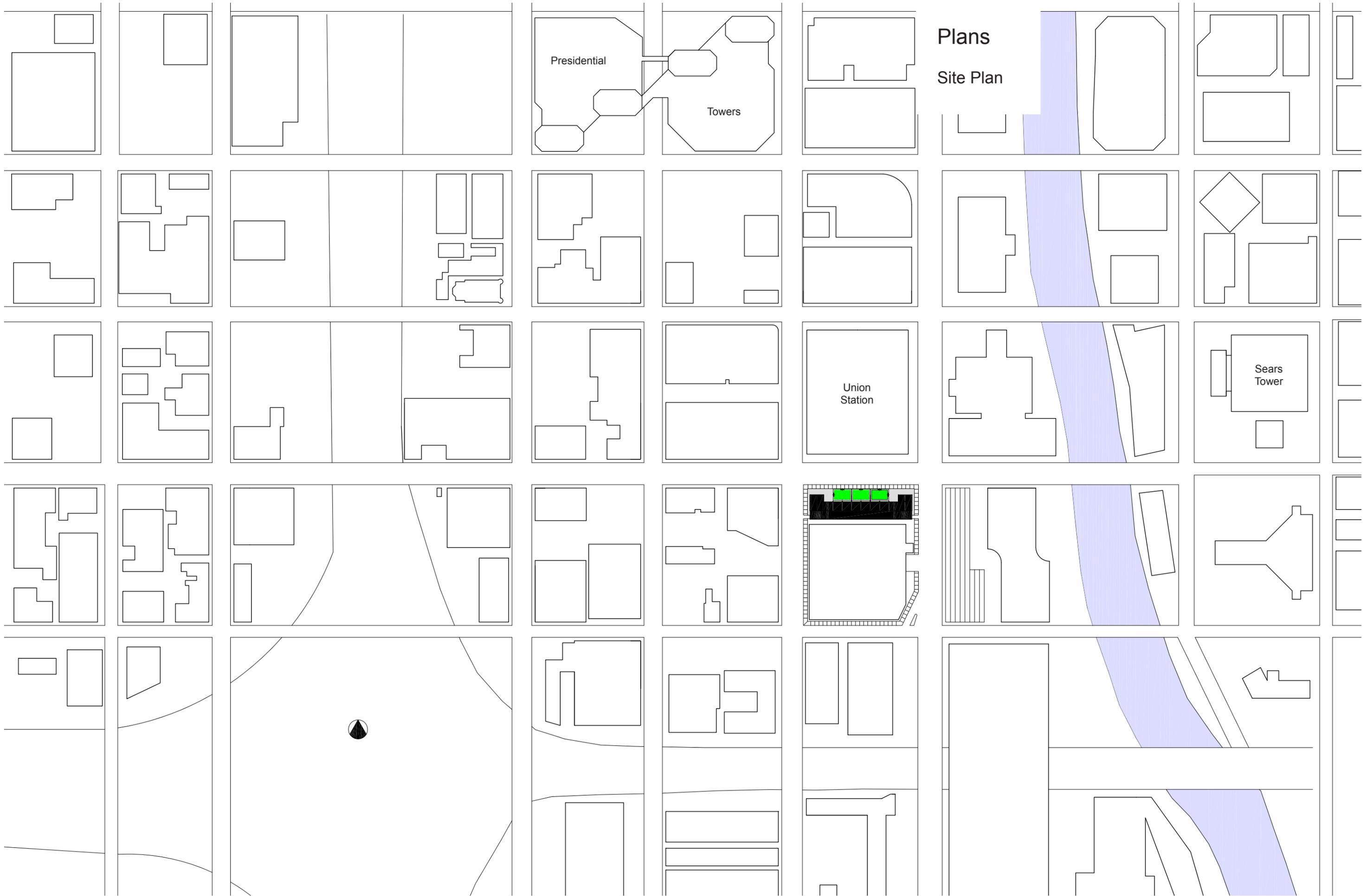
### Aerial

### Streetscape

The building is located in Chicago, IL. The site is to the west of the Loop bordered to the north by W Jackson Blvd, to the east by S Canal St, and to the west by S Clinton St. Currently the site is a surface parking lot and is adjacent to a large 5-story parking garage on the south end of the block.

The shape of the site, and the adjacent parking garage were two factors in the design and layout of the building. The building is long and narrow, following the dimension of the site. A benefit of this is the ample natural sunlight available which reduces the need for artificial lighting. The apartments themselves are raised up to the 5th story; this is so the apartments do not look directly into the parking garage and vice versa.





Plans

Site Plan

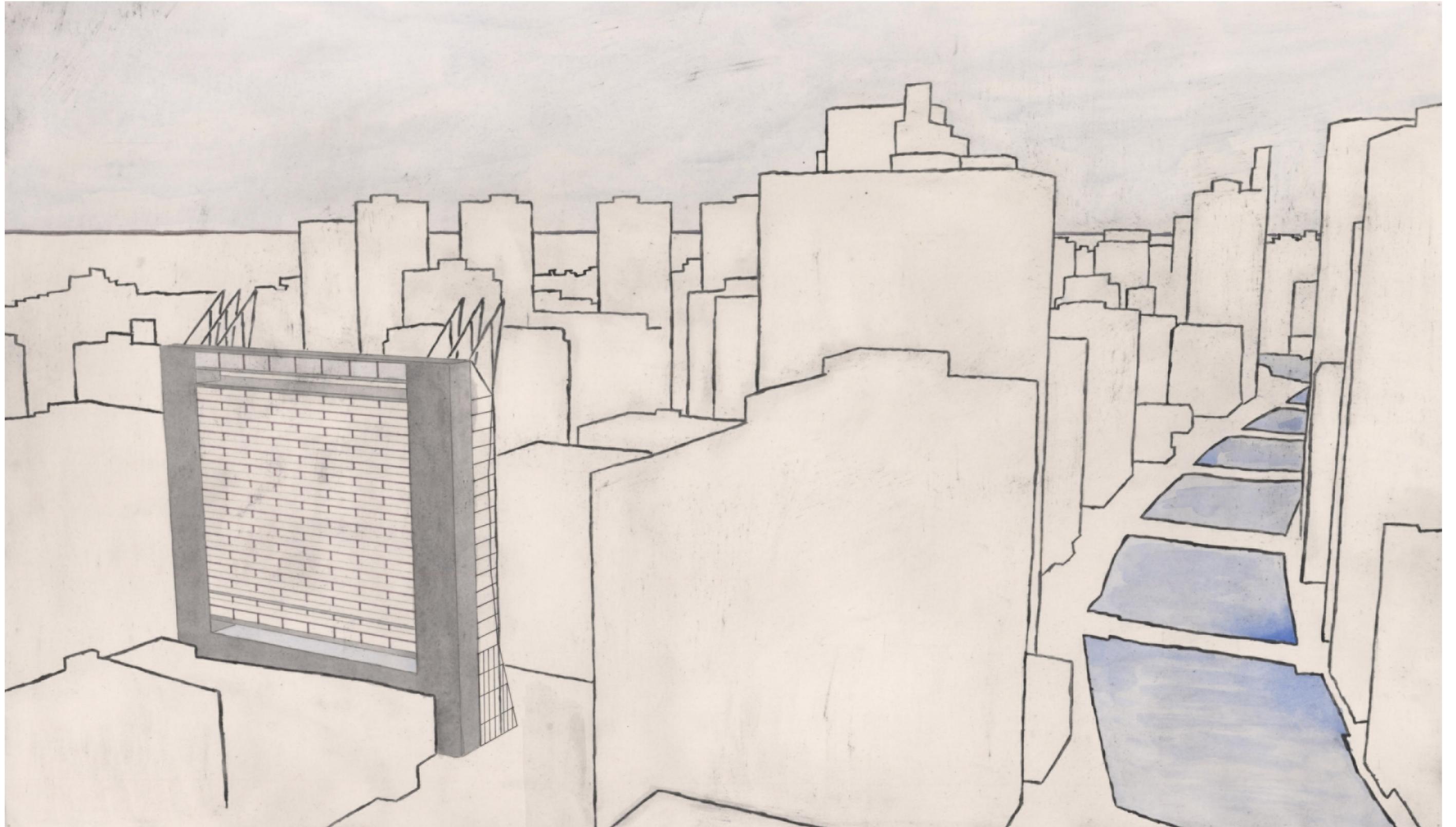
Presidential

Towers

Union  
Station

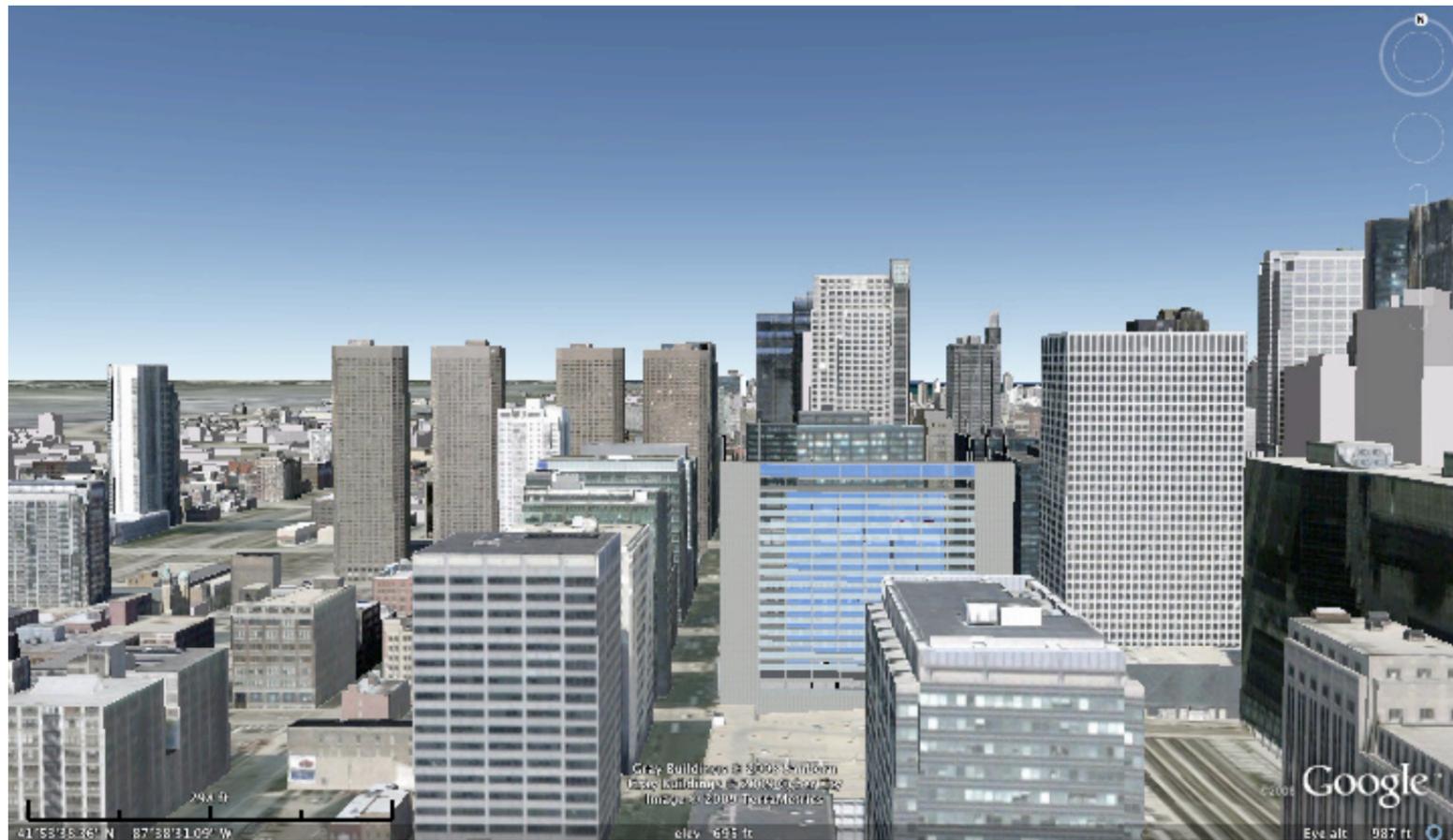
Sears  
Tower

Watercolor Image



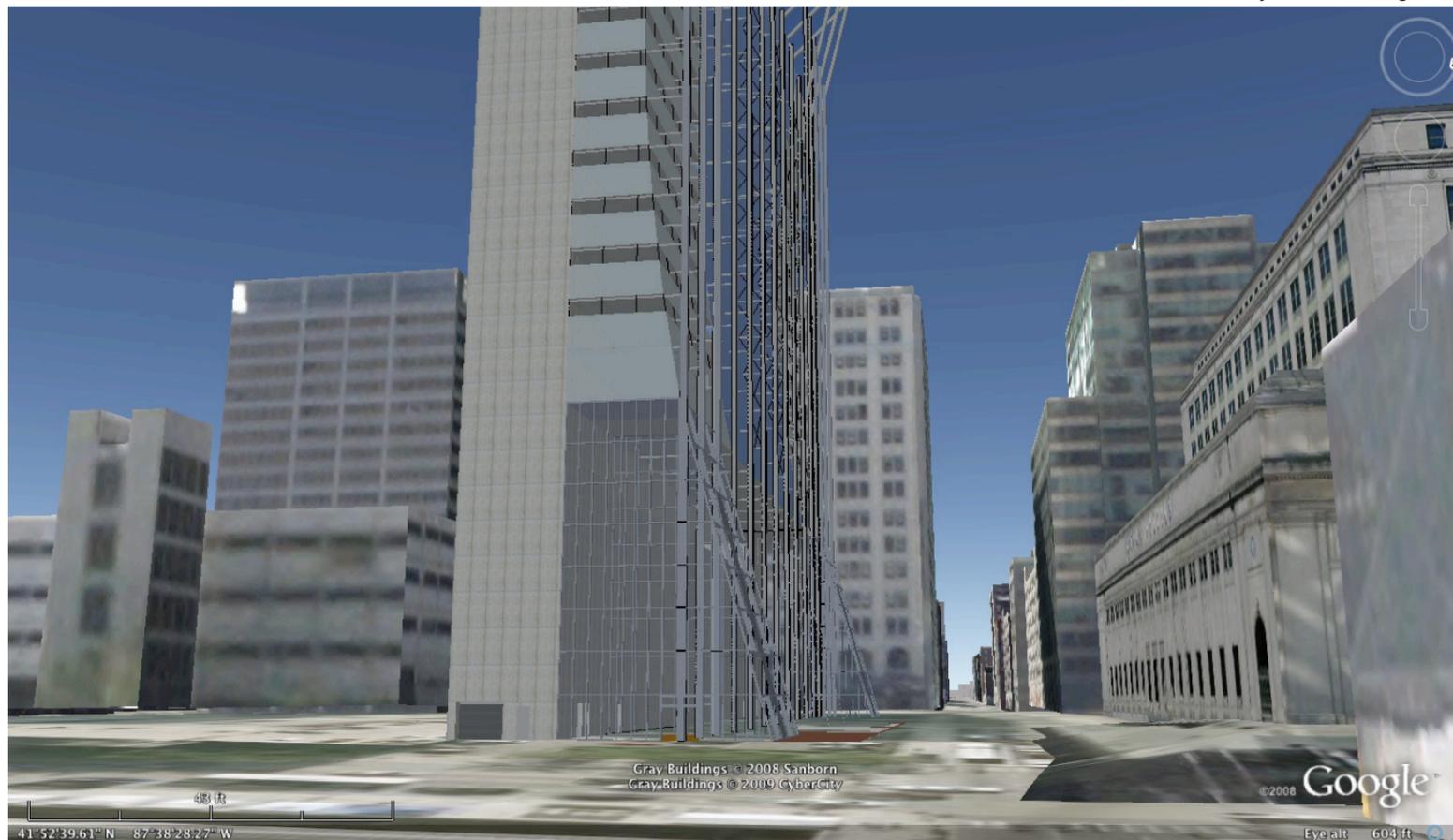
## 3-D Renderings

Building and Site



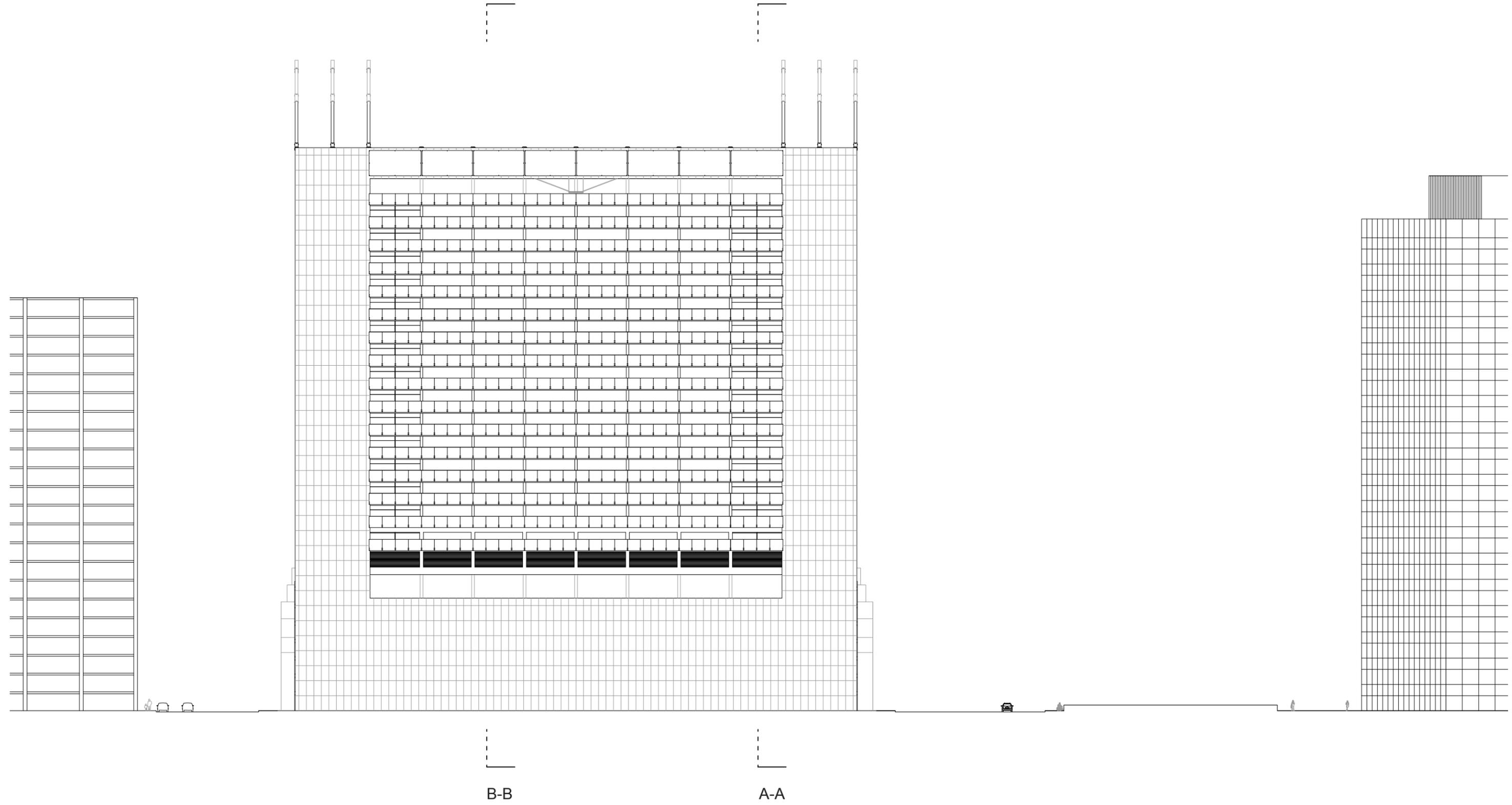
South facade of the building looking north

East entry atrium looking west



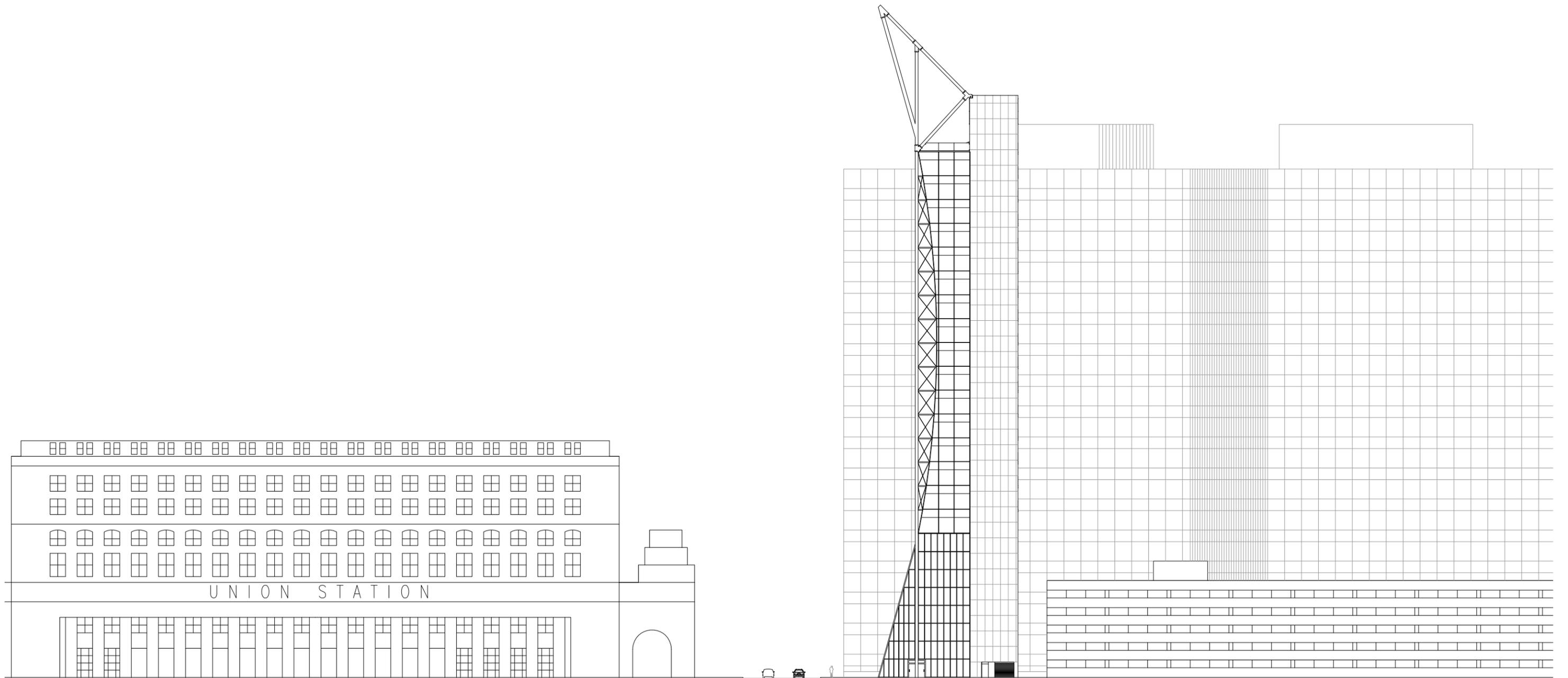
# Elevation

South



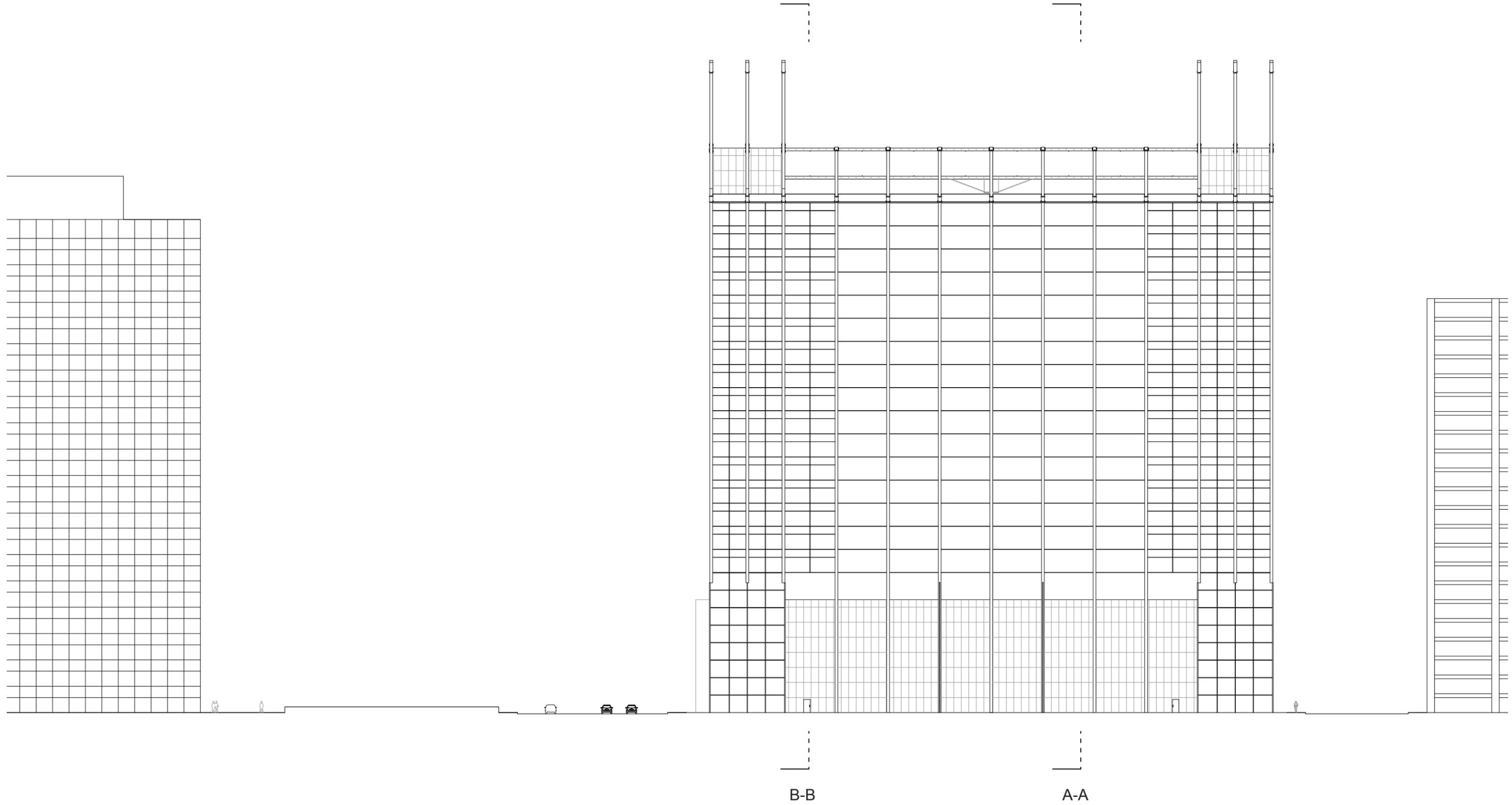
# Elevation

West



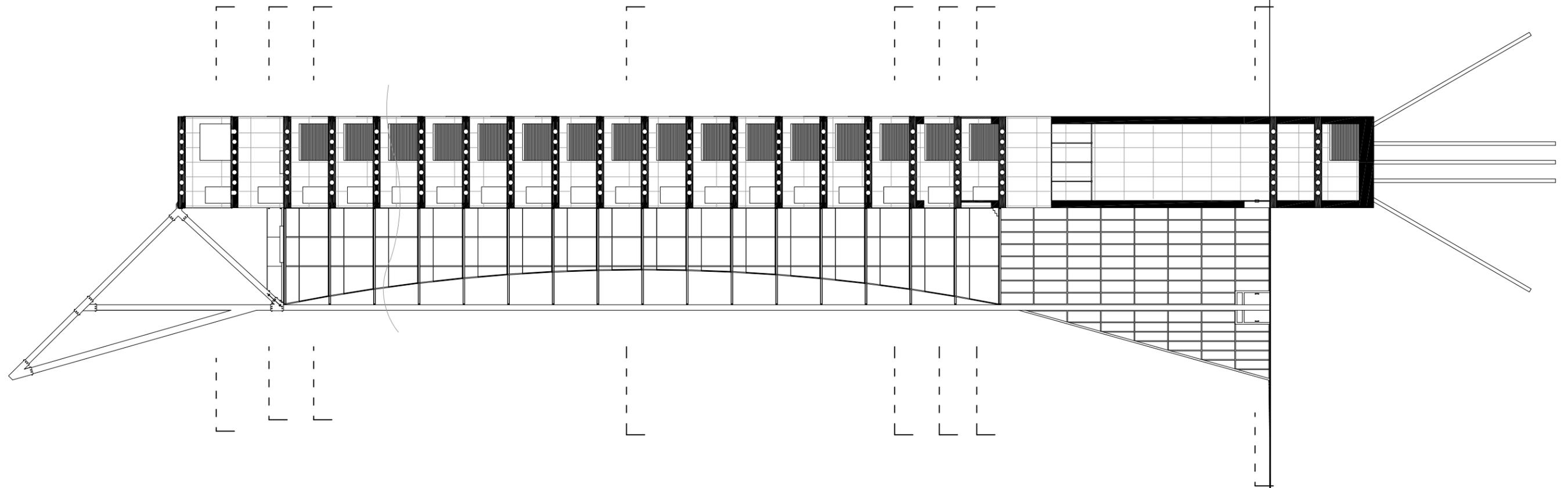
# Elevation

North



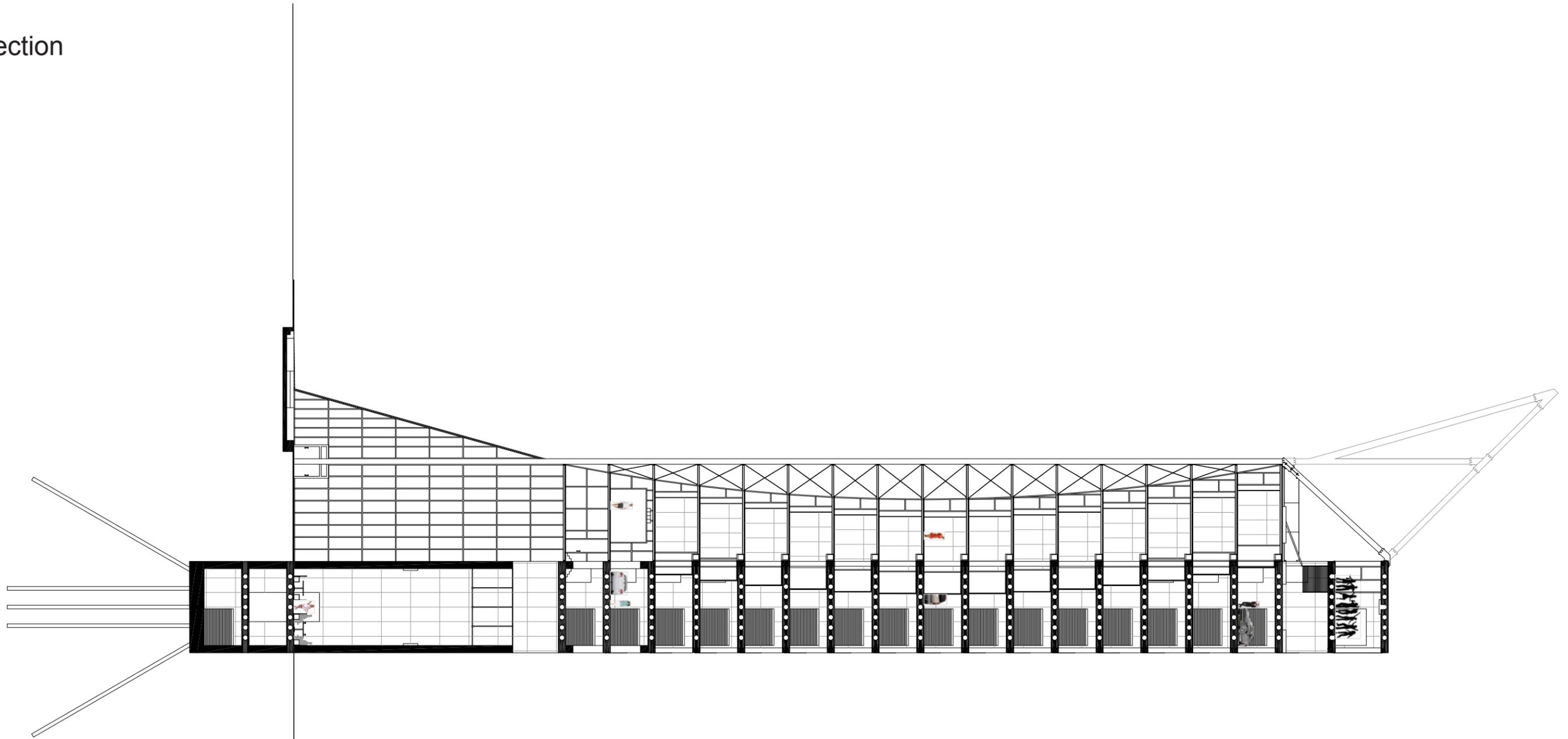
# Section

When viewed horizontally,  
the vertically stacked  
apartments resemble  
horizontally stacked  
townhouses.



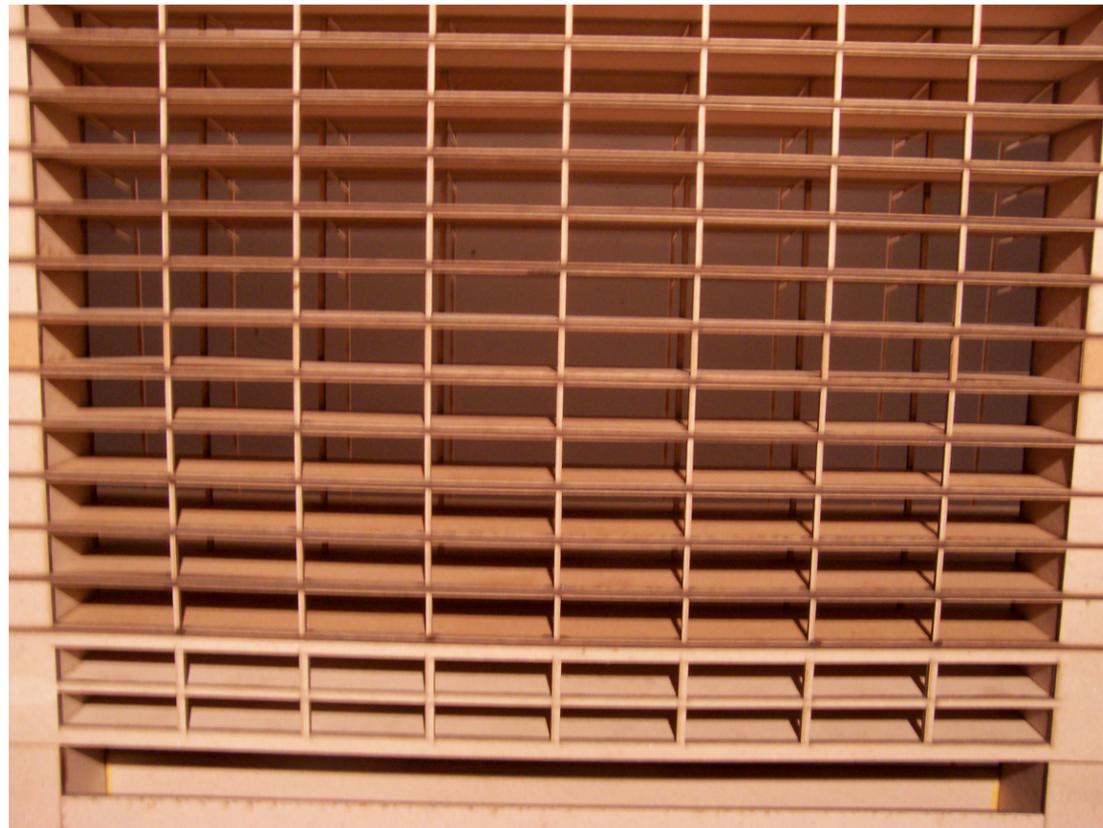
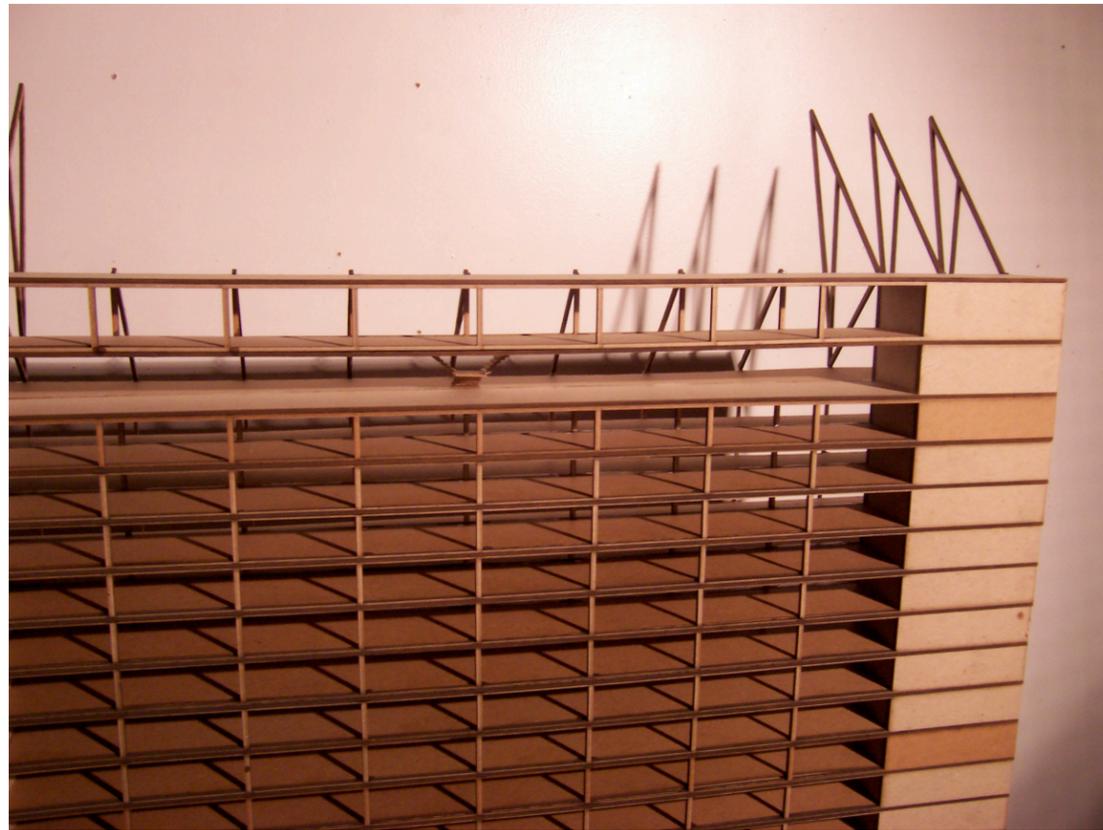
Section A-A

Section

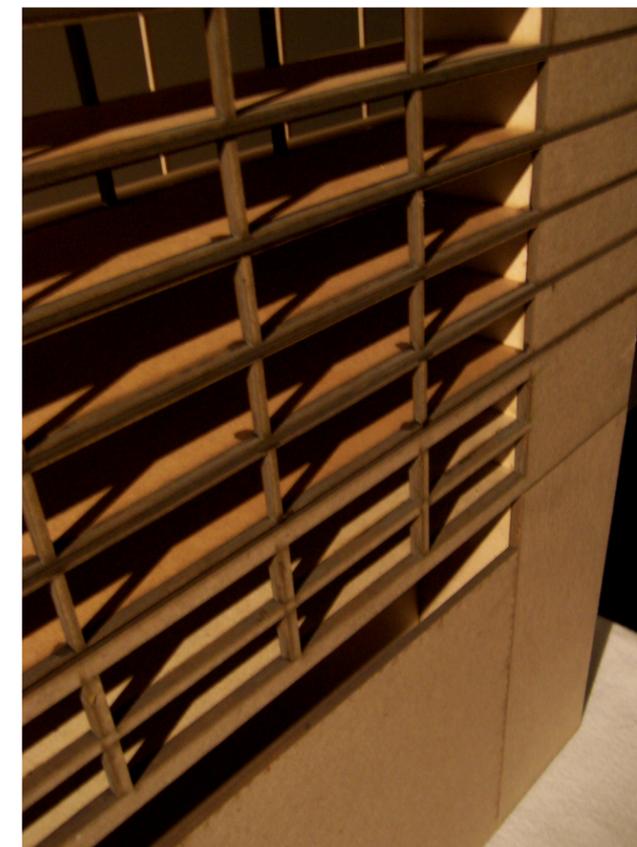


Section B-B

Model Photographs



Model Photographs



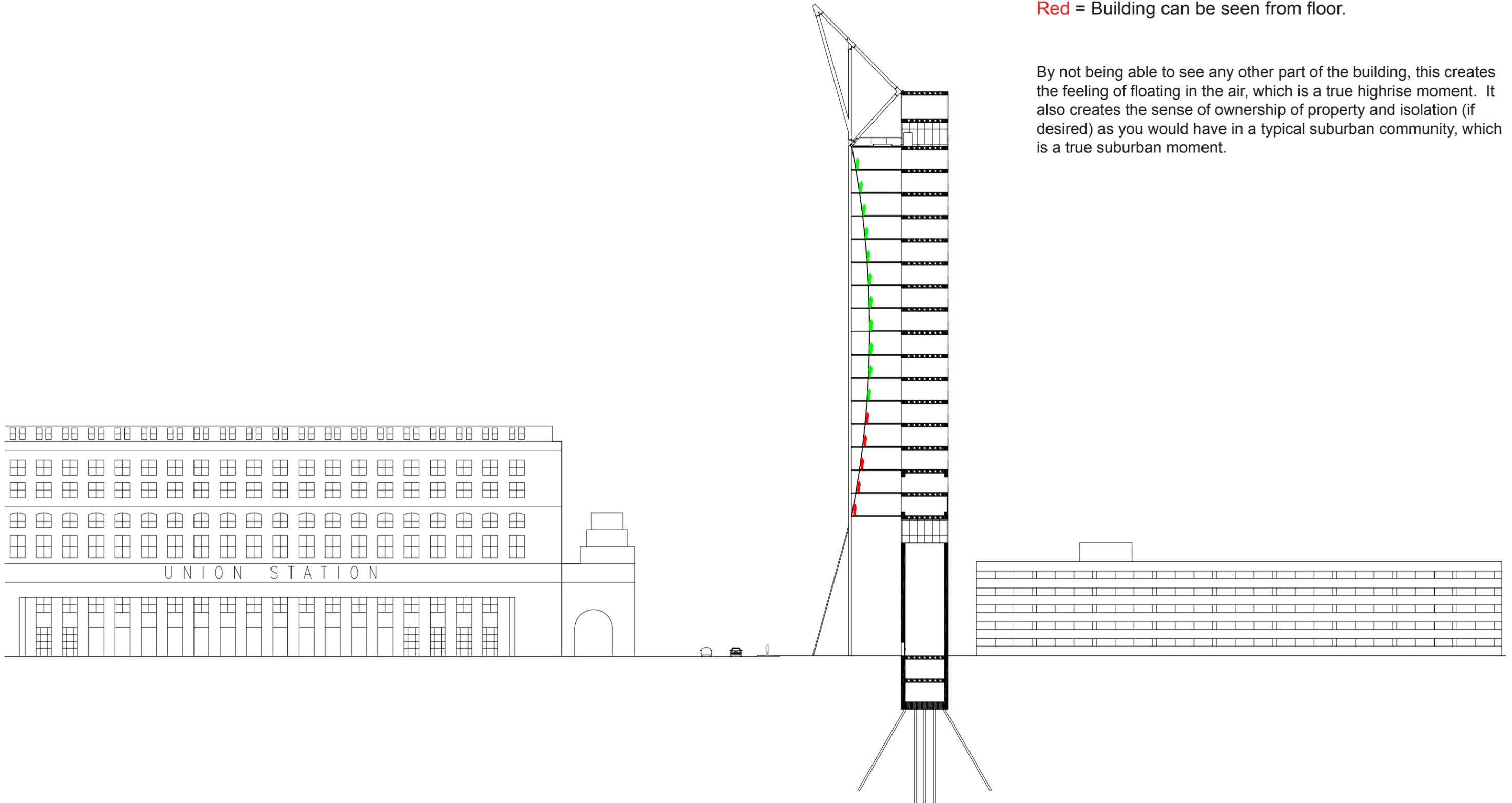
# Diagram

## Floor Sightlines

Green = Building cannot be seen from floor.

Red = Building can be seen from floor.

By not being able to see any other part of the building, this creates the feeling of floating in the air, which is a true highrise moment. It also creates the sense of ownership of property and isolation (if desired) as you would have in a typical suburban community, which is a true suburban moment.



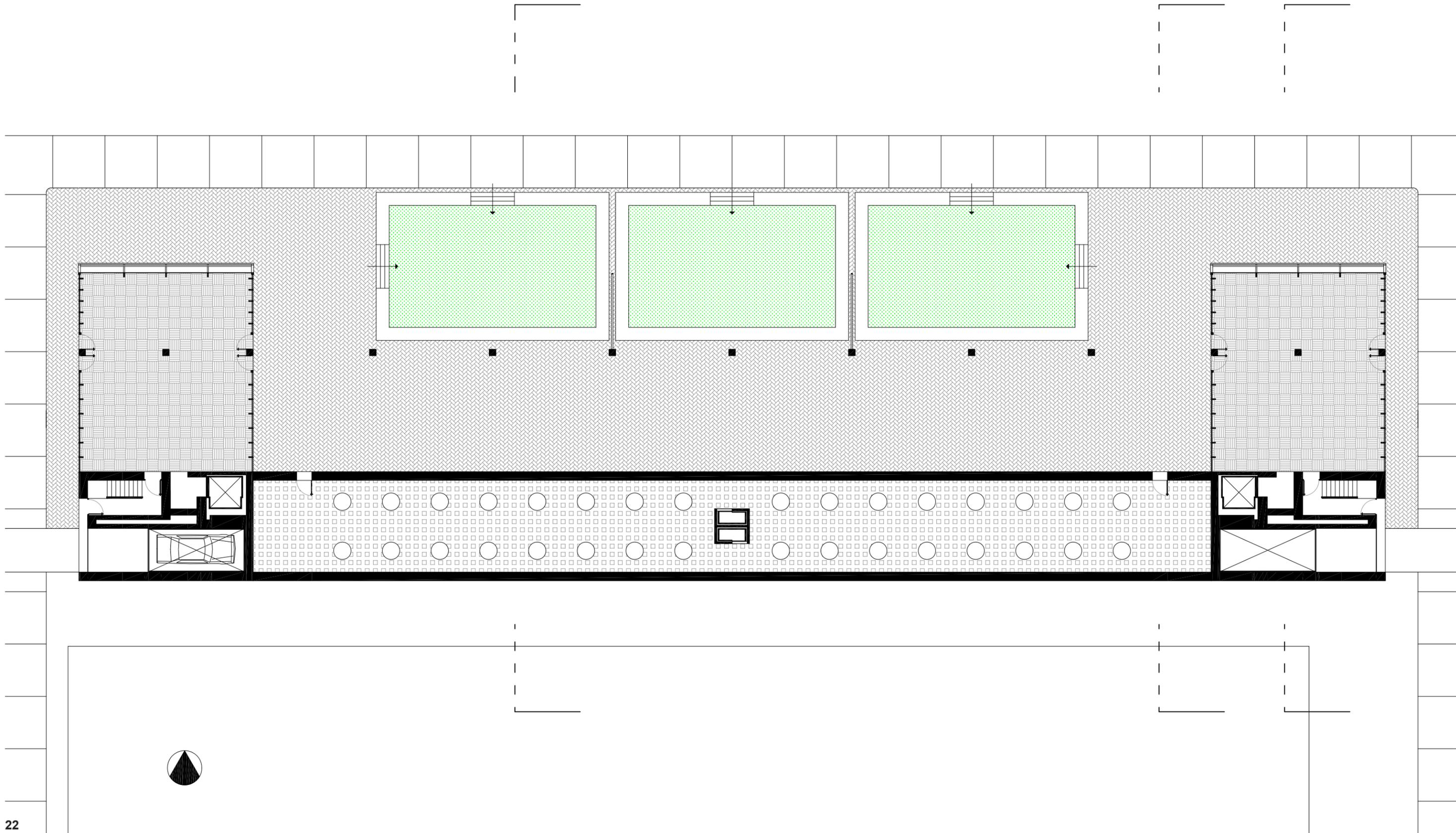
# Plans

## Entry Atrium and Restaurant

B-B

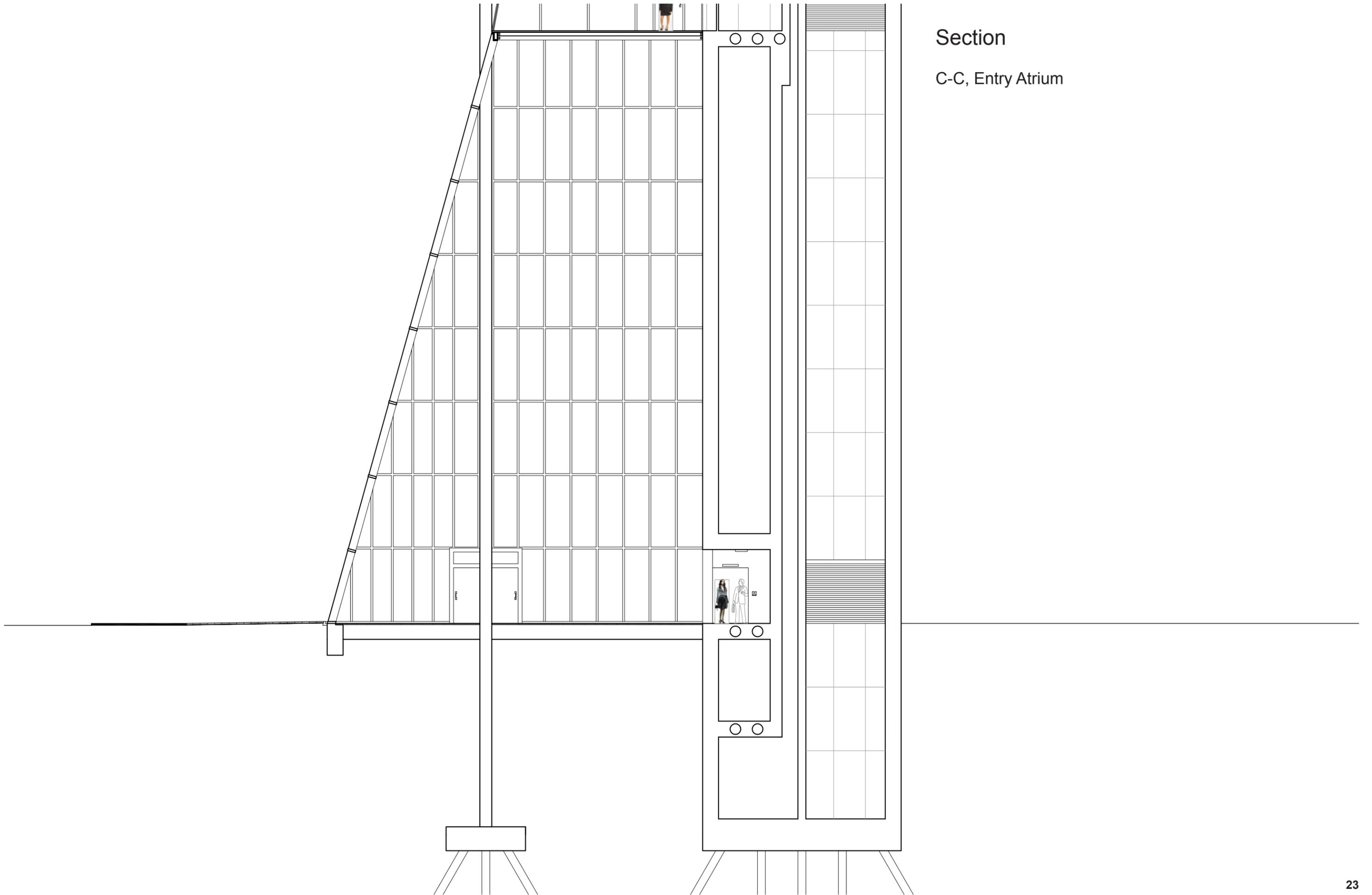
A-A

C-C



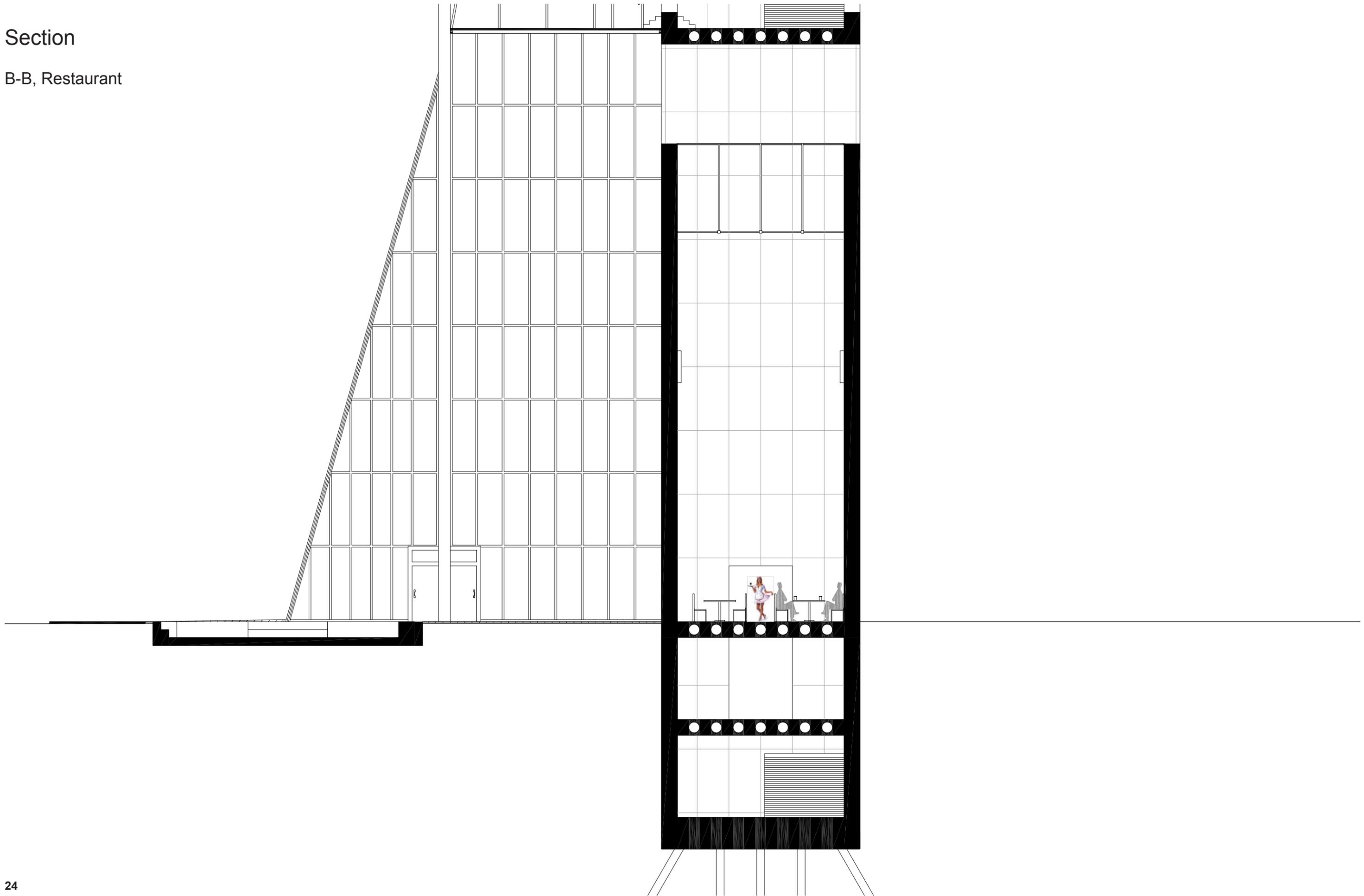
Section

C-C, Entry Atrium



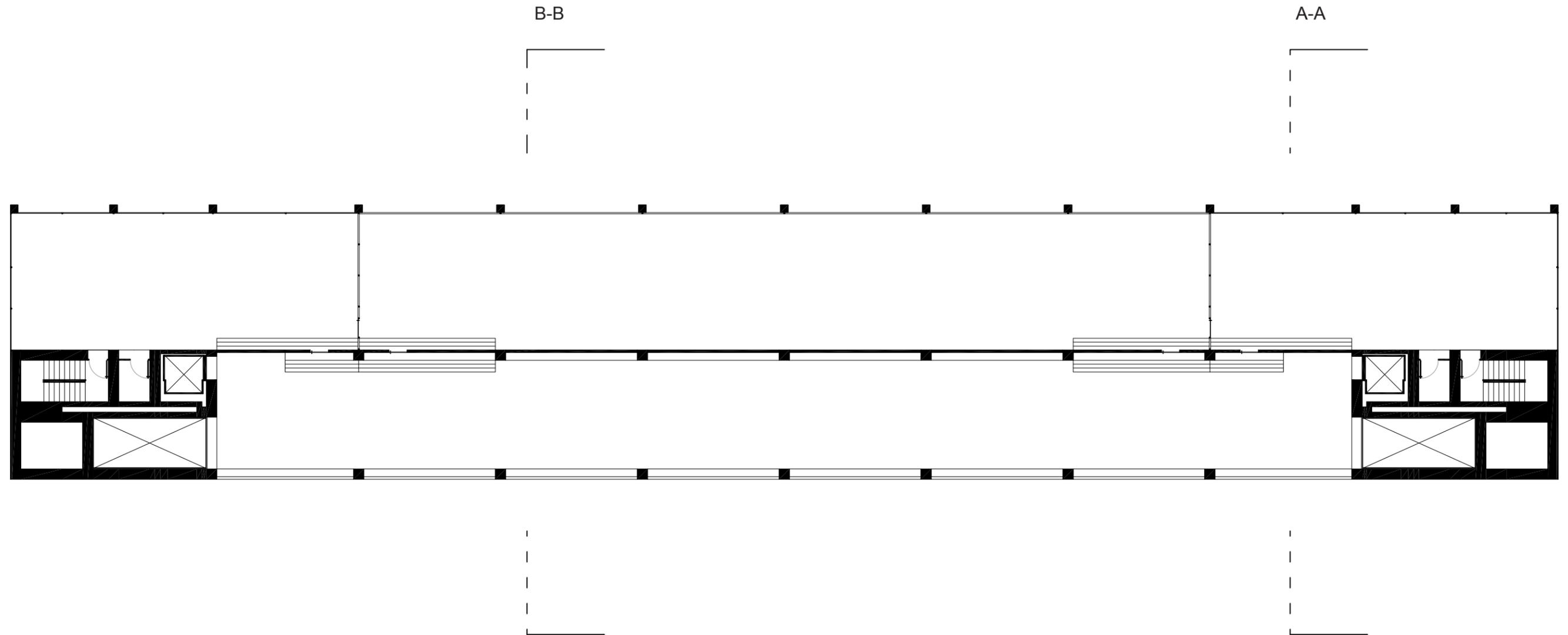
Section

B-B, Restaurant



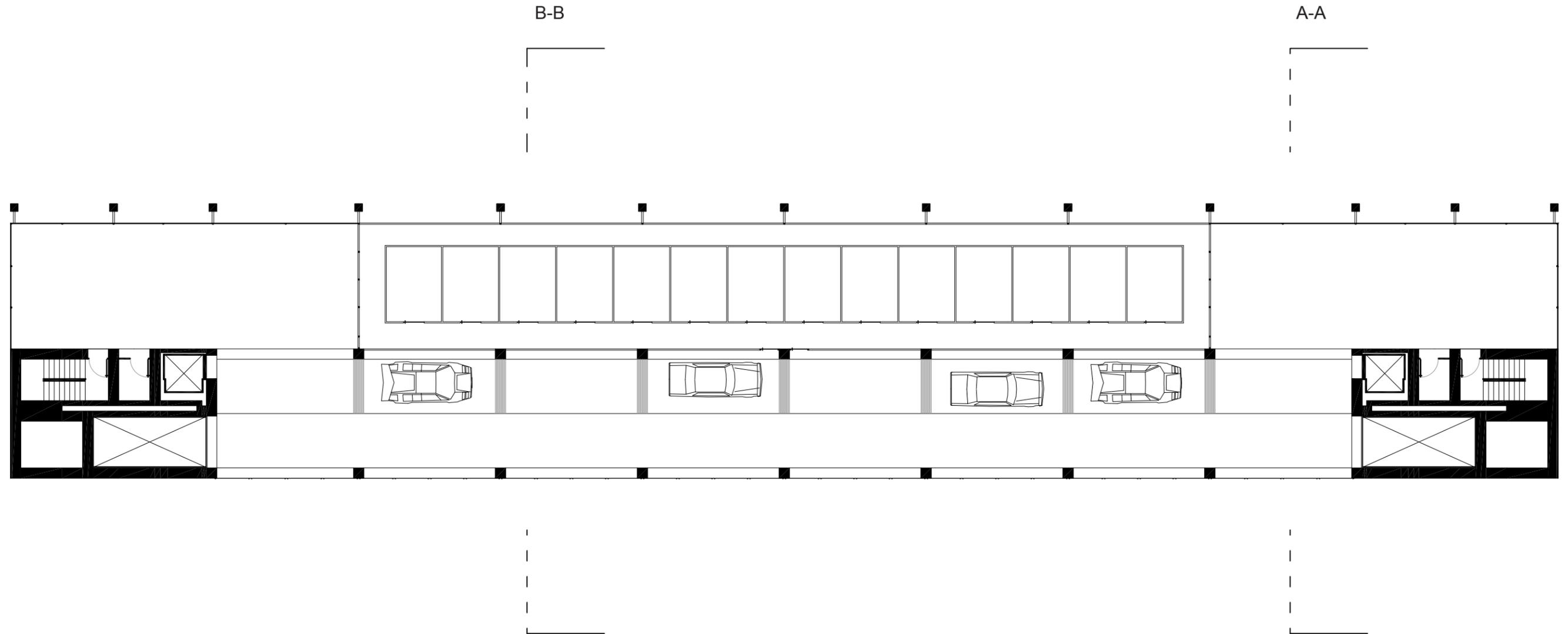
# Plans

Mechanical / Service Level



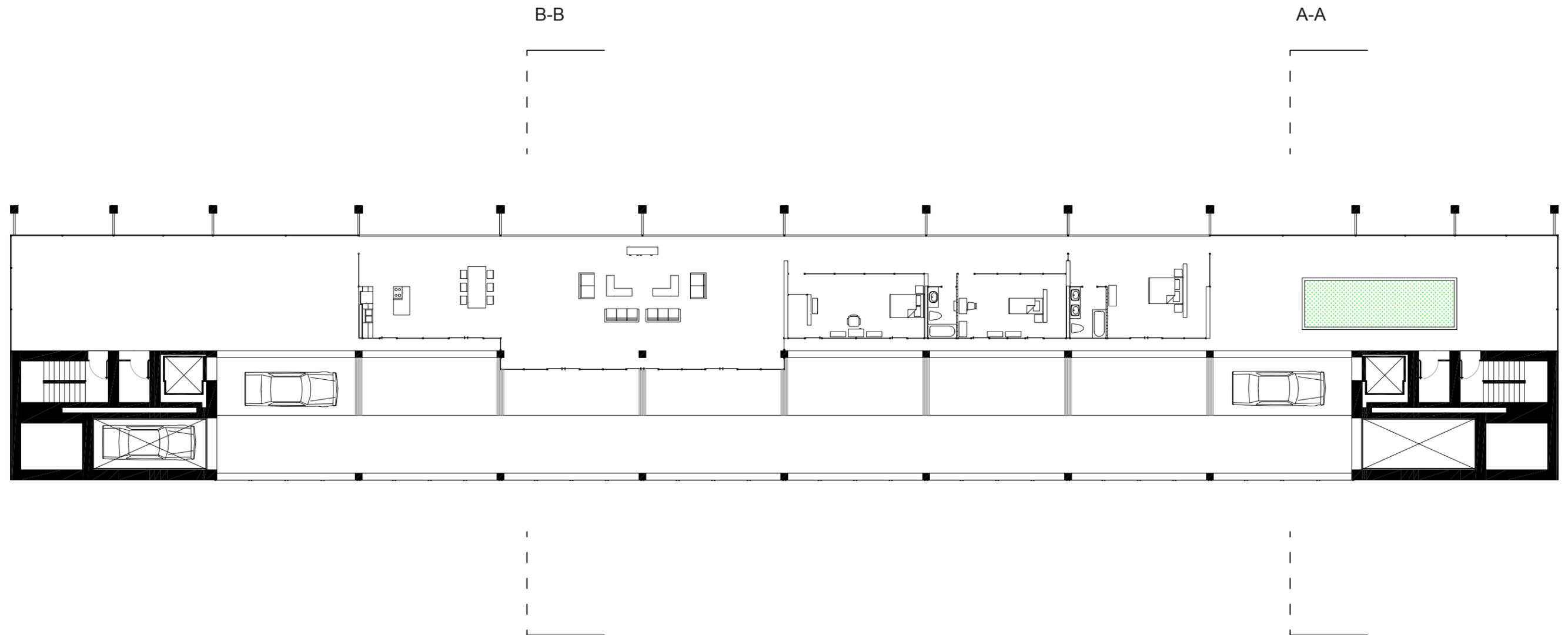
# Plans

## Resident Storage + Overflow Parking Level



# Plans

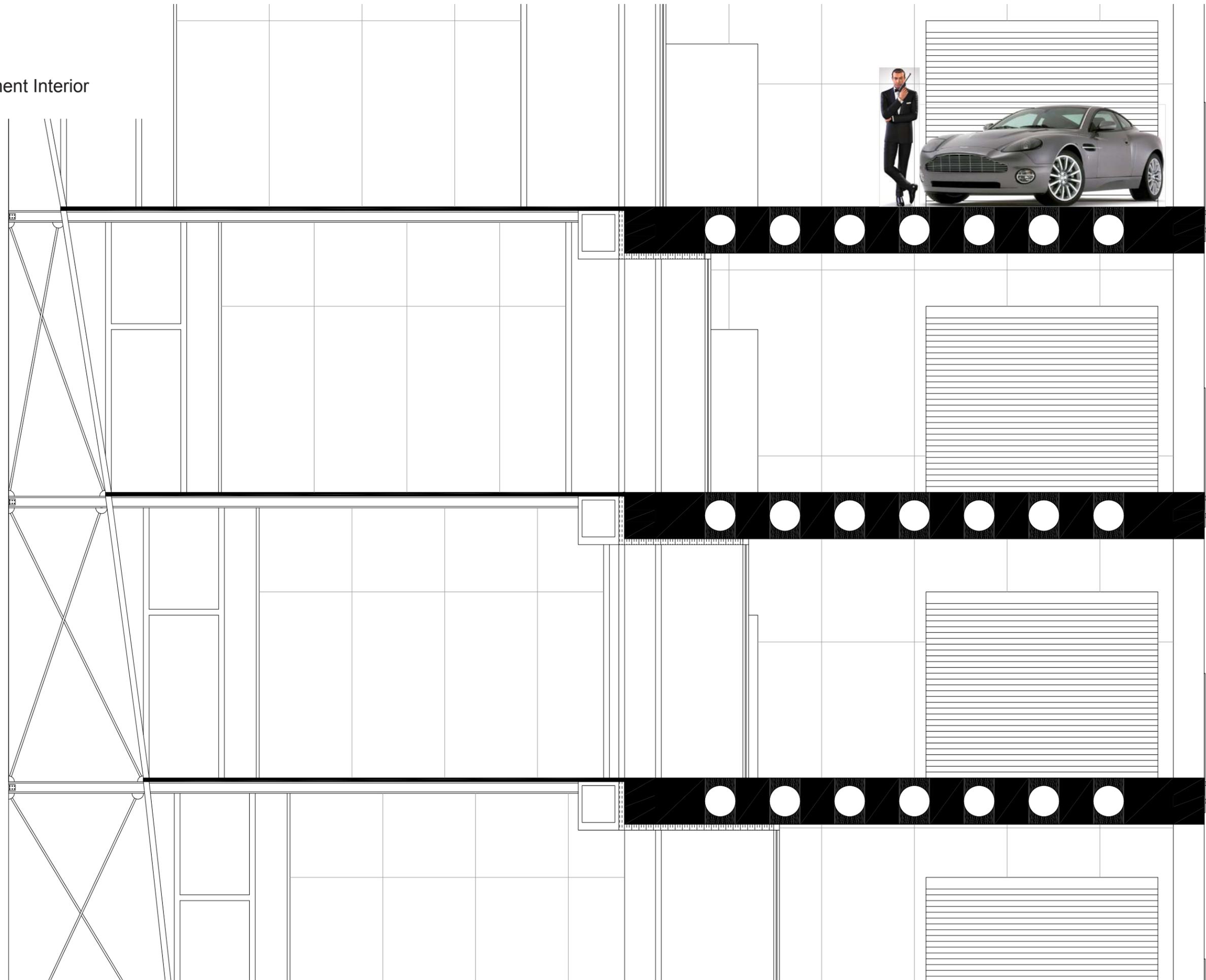
## Lower Apartment Level



“...in the United State carefully tended grass became the mark of suburban respectability.” (Jackson, p. 60).

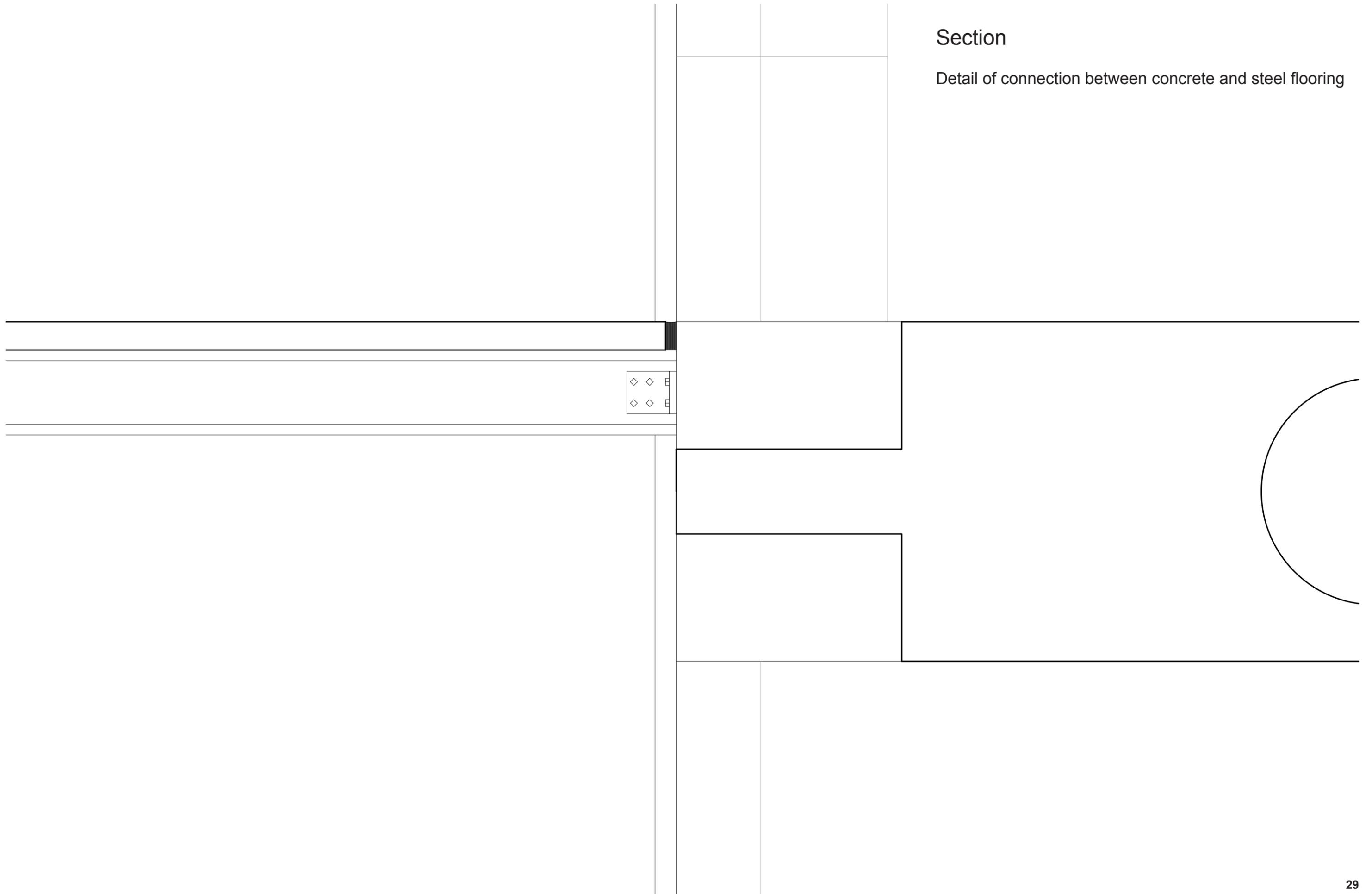
Section

B-B, Apartment Interior



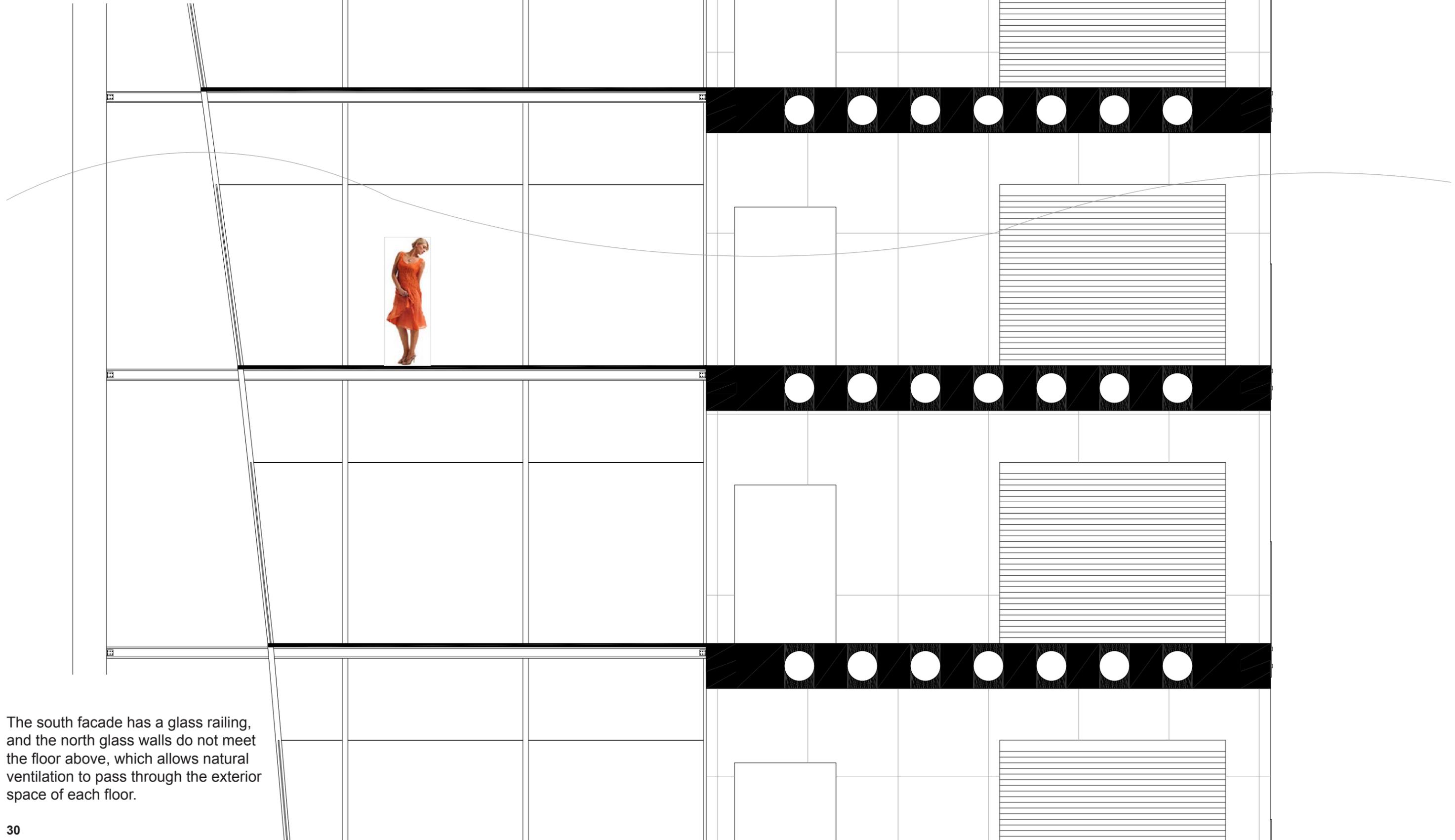
# Section

Detail of connection between concrete and steel flooring



# Section

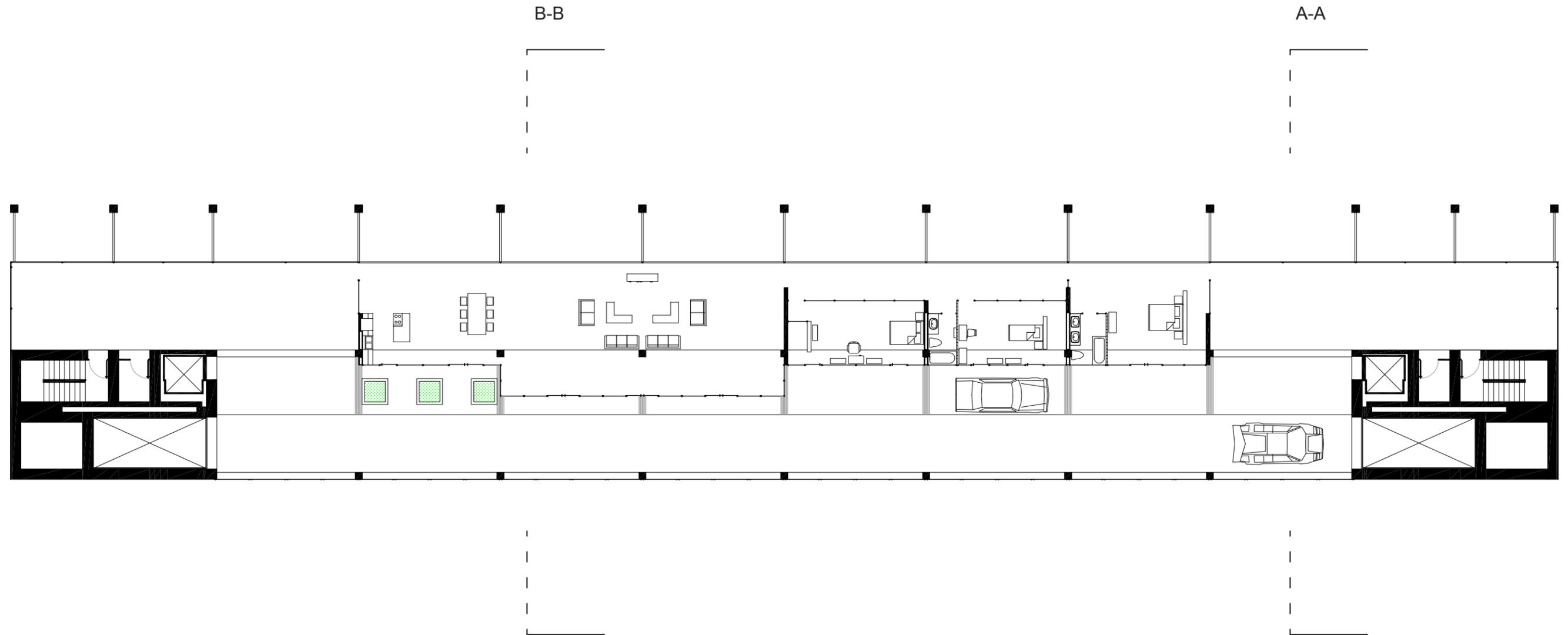
## A-A, Apartment Exterior



The south facade has a glass railing, and the north glass walls do not meet the floor above, which allows natural ventilation to pass through the exterior space of each floor.

# Plans

## Center Apartment Level



# 3-D Renderings

## Apartment Interior



Apartment living room from kitchen

Master bedroom looking down hallway



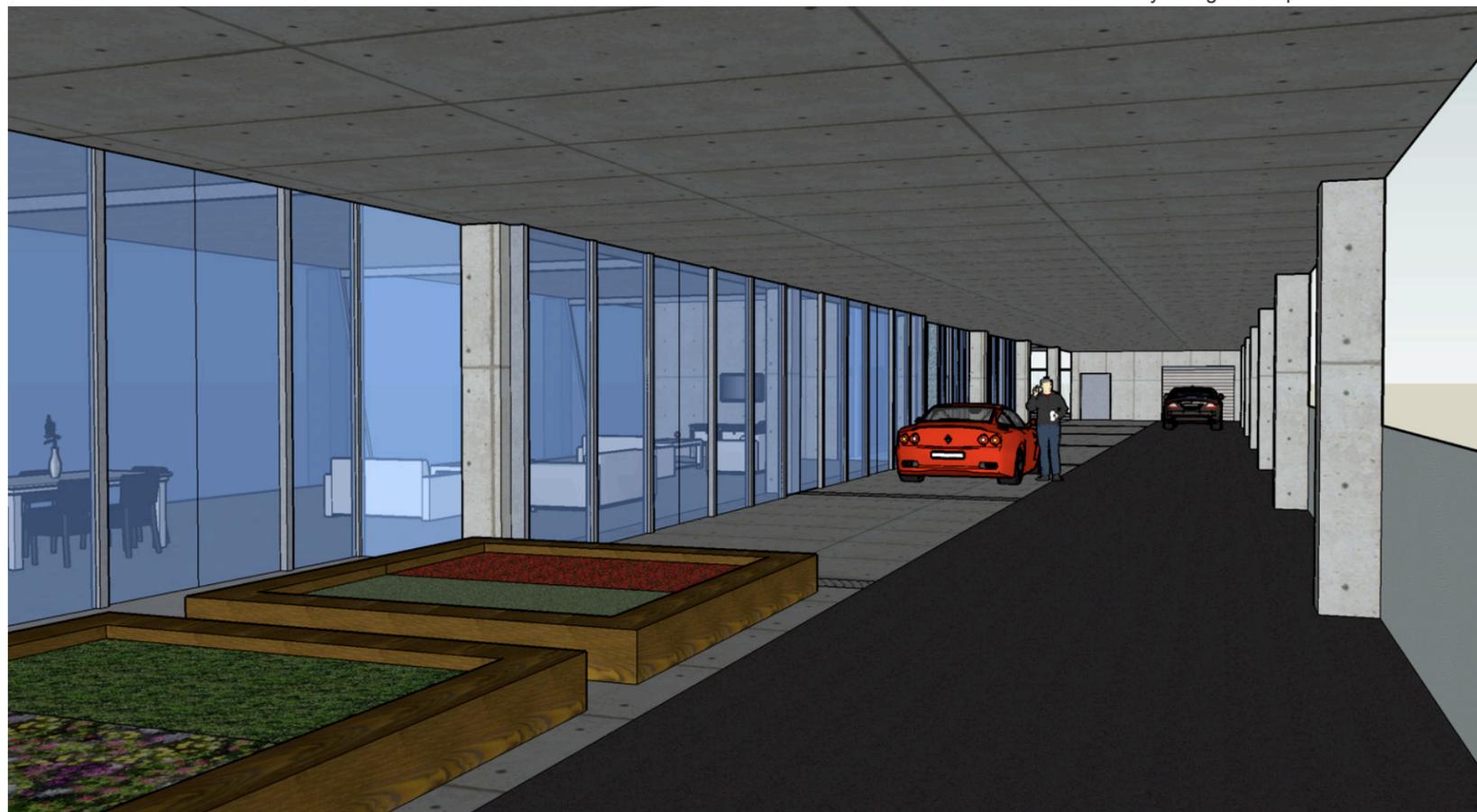
## 3-D Renderings

### Apartment Exterior



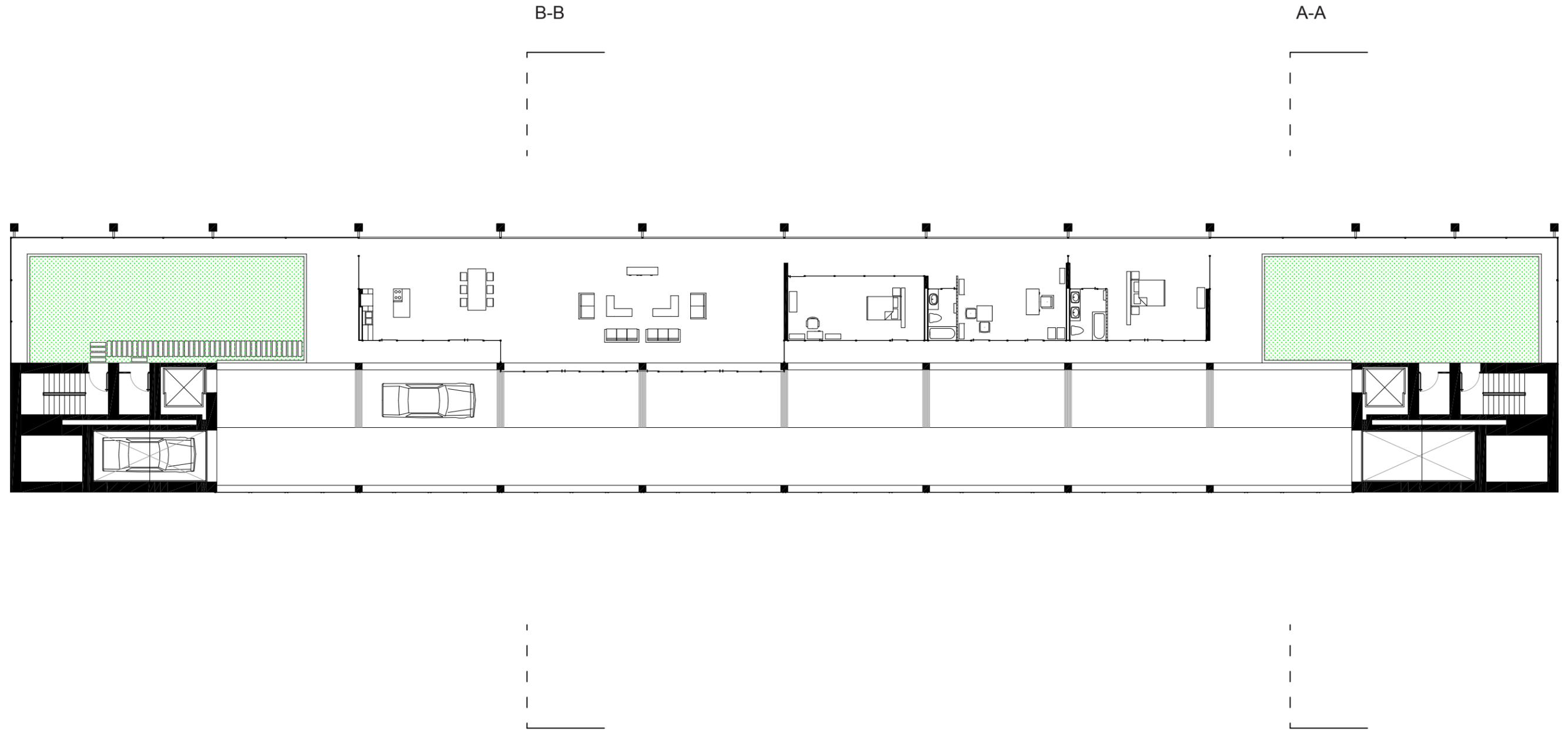
Yard space and apartment entry on north facade

Driveway and garden space on south facade



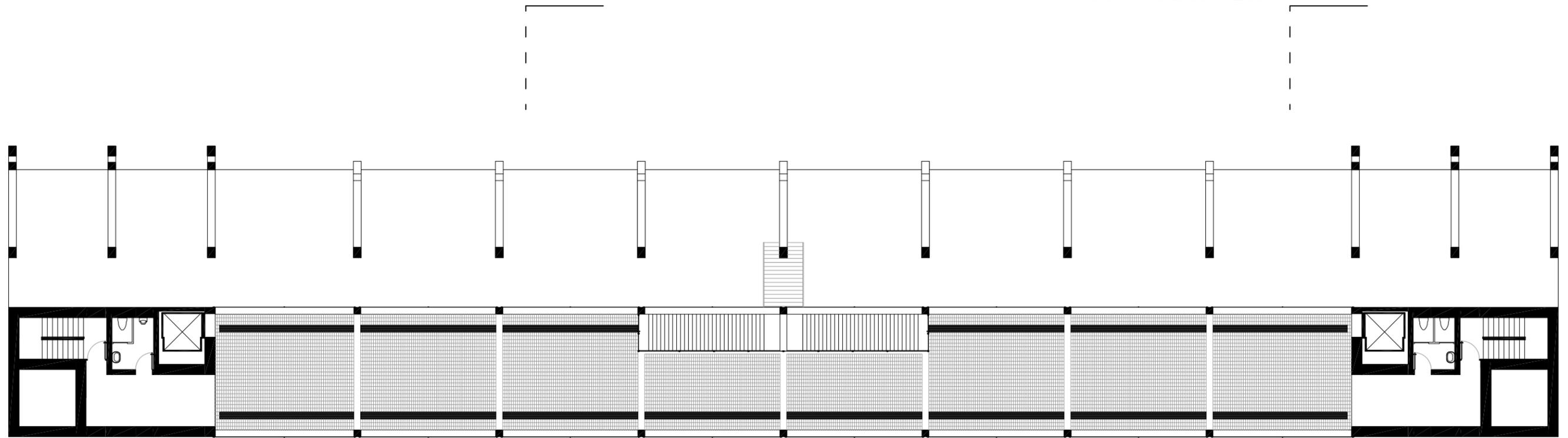
# Plans

## Top Apartment Level

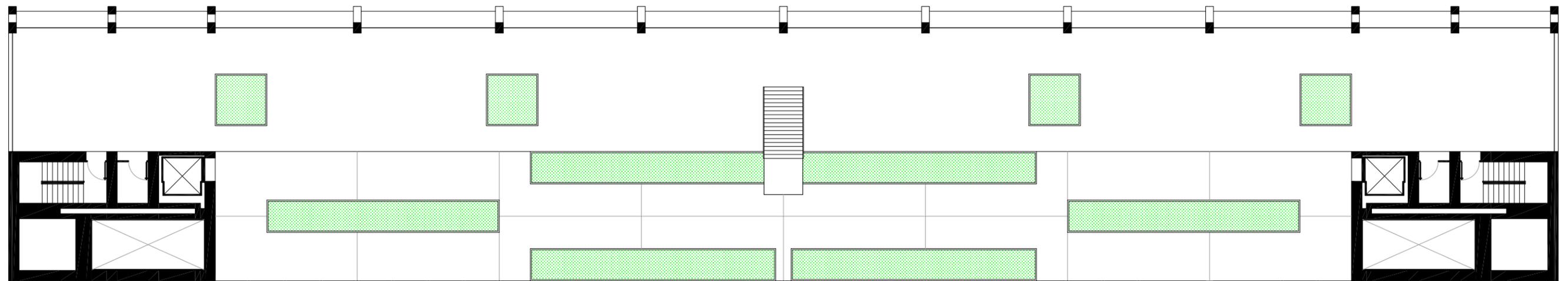


# Plans

Interior Gardent Level



Exterior Garden Level



B-B

A-A

## Diagram

### Building-Sky Structure

The vertical structure at the east and west ends extends vertically past the necessary structure to support the building to create a connection between the building and the sky above. This links the top of the building in a more delicate manner than simply ending the building with the horizontal roof.

This decorative framing structure also expresses the movement within the building. The structure extends upward at the end cores, which is where there is vertical movement within the building. There is no continuing structure in the center of the building, it ends where it is no longer structurally necessary. This is where there is horizontal movement within the building.



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Gray Buildings © 2008 Sanborn  
 Gray Buildings © 2009 CyberCity  
 Image © 2009 TerraMetrics  
 Image IndianaMap Framework Data

285 ft

41°52'36.06" N 87°38'25.30" W

elev 636 ft

Nov 6, 2007

Eye alt 874 ft

©2008 Google™

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## References

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Appendix A:

Atelier Olgiati, Spring 2007

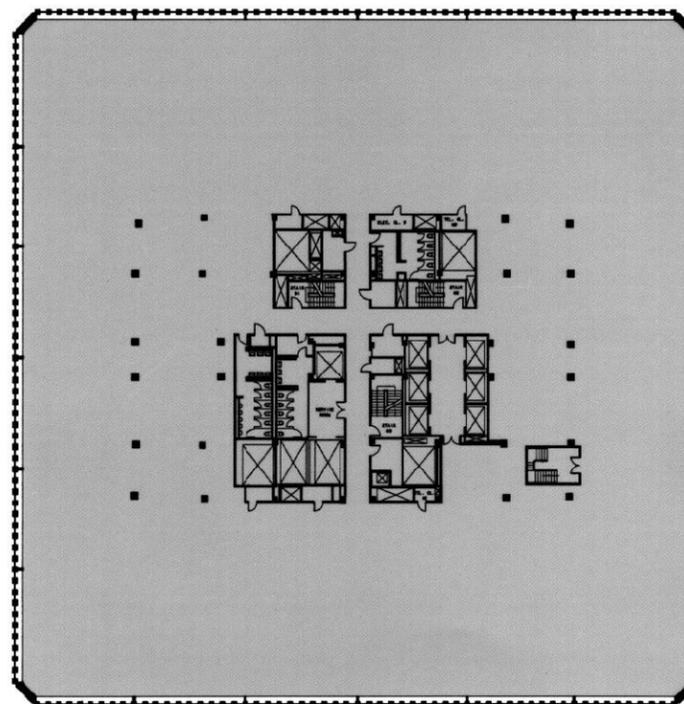


5. Editt Tower, Singapore

6. Elephant & Castle Eco Tower, London



7. 2 World Trade Center, typical floorplan



“Skyscraper architecture has remained essentially unchanged since its invention...Their basic planning remains the same. Whether built of concrete or of steel, most are still nothing more than a series of stacked trays piled homogeneously and vertically one on top of the other, while at the same time seeking to optimise net-to-gross areal spatial efficiencies.” (Yeang, p. 11)

The project began in the spring 2007 studio of Valerio Olgiati at the Accademia di Architettura in Mendrisio Switzerland. The subject of the studio was housing. The only other guideline was the floor area of the structure. Each student chose randomly an area, the area I chose was 5000m<sup>2</sup> or approx. 58,800 ft<sup>2</sup>. The site and specific housing program was up to the individual.

The site chosen was Chicago and the program was private apartments. Chicago was chosen because I had previously worked on projects there and was familiar with the city. Being located in a central urban setting, and specifically outside the downtown Loop, I decided that the apartment building would be a highrise. I had done some research into highrise buildings for my previous projects in Chicago, and proceeded from there.

As a part of my previous research I had looked at the work of Ken Yeang and the eco-skyscraper movement. These buildings are mixed-use towers, each creating it’s own vertical city in the sky. They also employ the use of vegetation and irregular floor plans to break up the monotony of typical highrise plans and facades.

This led me to the question, can the typical highrise construction of floor slabs being stacked one on top of the other to maximize area be utilized in a way to create a new type of highrise building without the dramatic gestures of the eco-skyscraper?

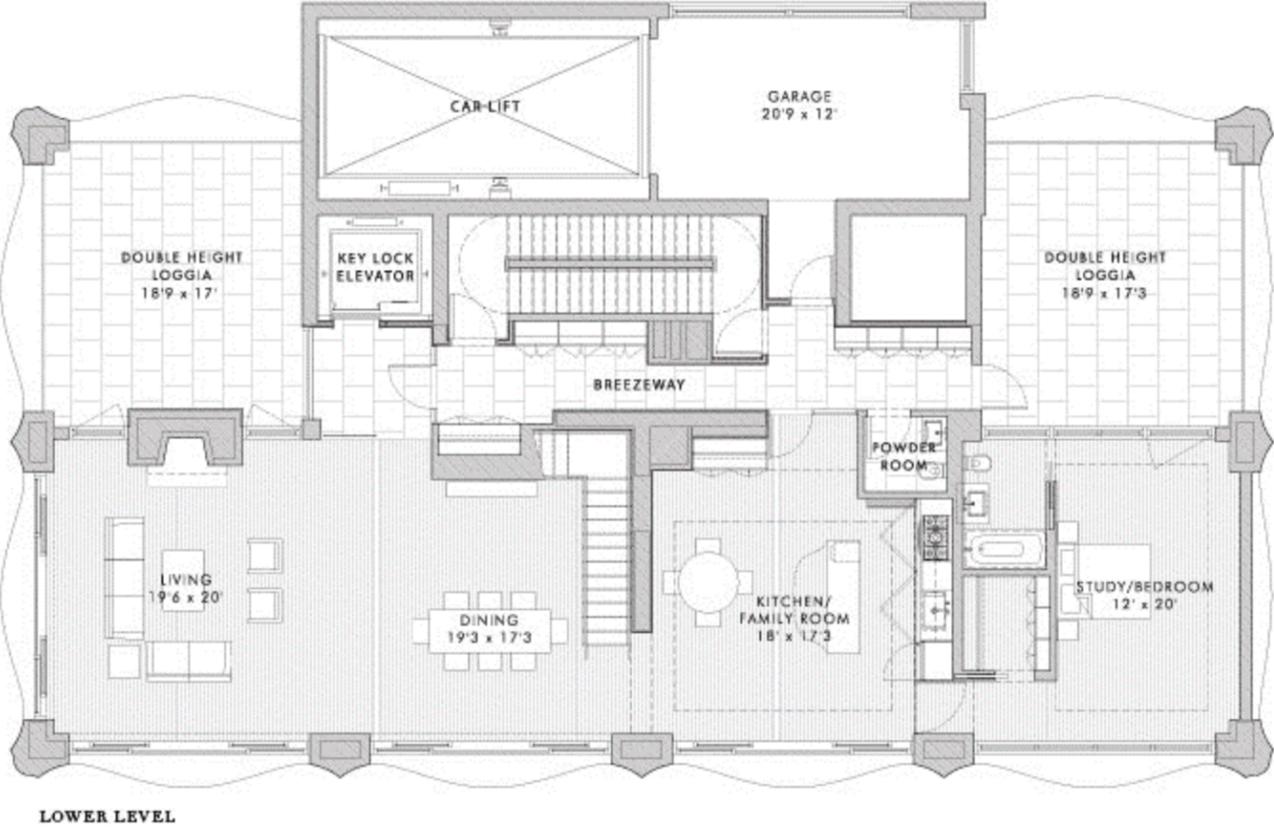
With the program of private housing, the site, and each floor being maximized for open space, each apartment could be the size of a house and make use of the entire floor. The project developed through the semester to include not only a house on each floor, but some of the amenities that accompany it as well; exterior space and a driveway.

Examples of residential buildings utilizing a car elevator.



8. Carloft Building, 5th floorplan. Berlin, Germany

9. 200 Eleventh Avenue penthouse apartment floorplan. New York, NY





Critica Finale

Site Image

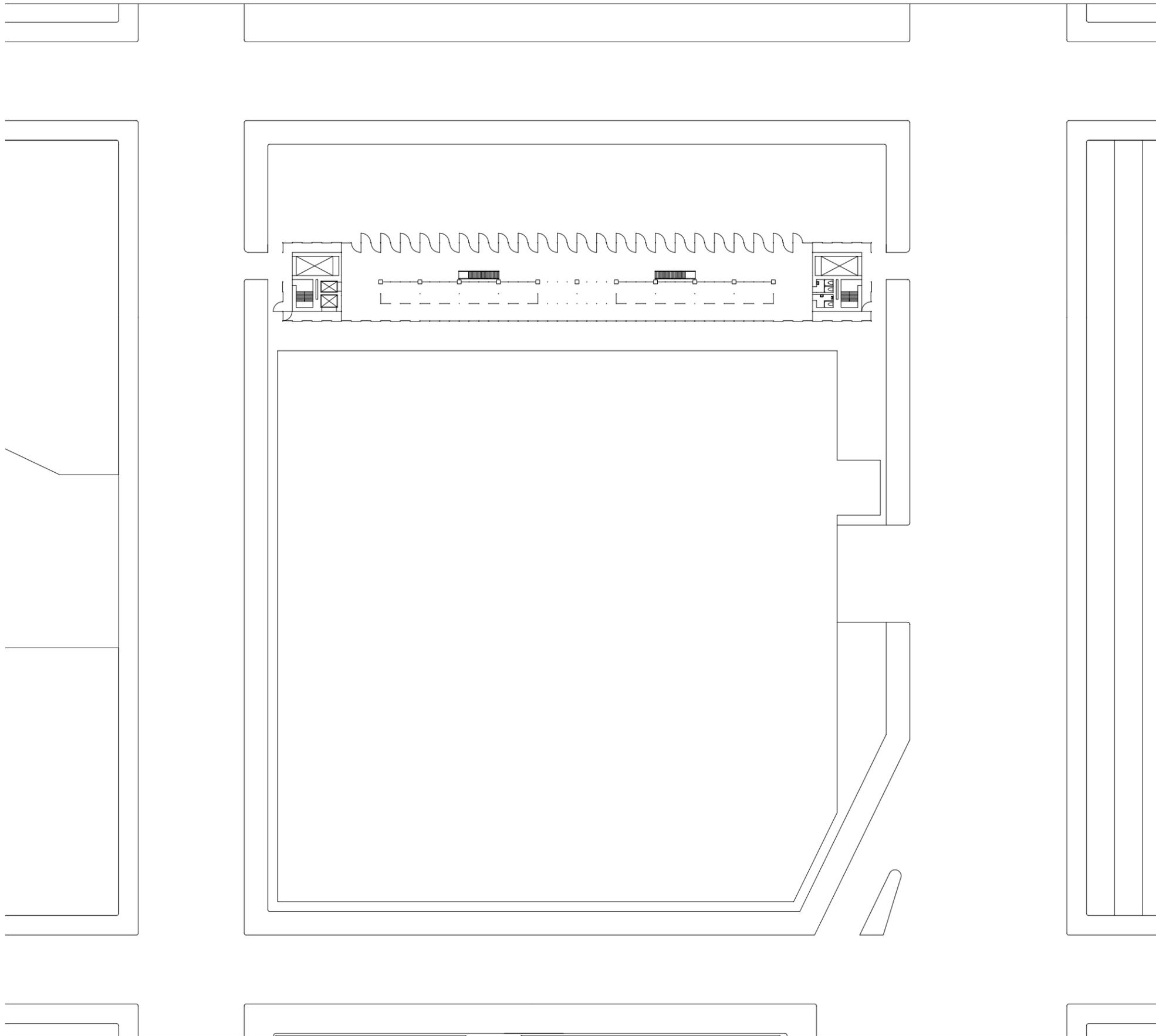
# Critica Finale

## Site Plan



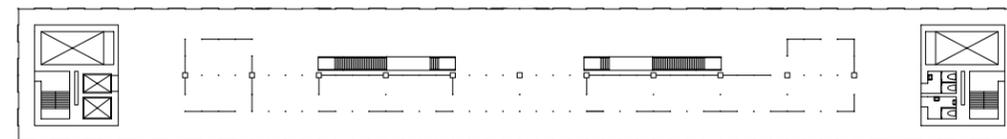
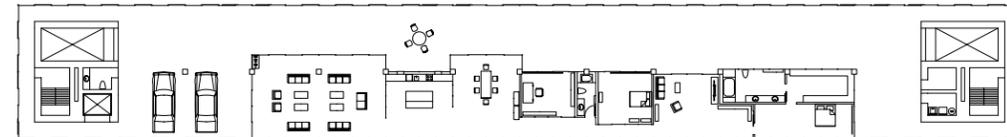
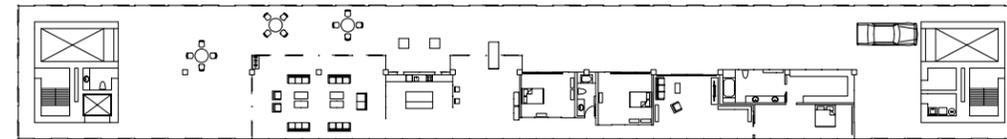
# Critica Finale

## Ground Floor Plan



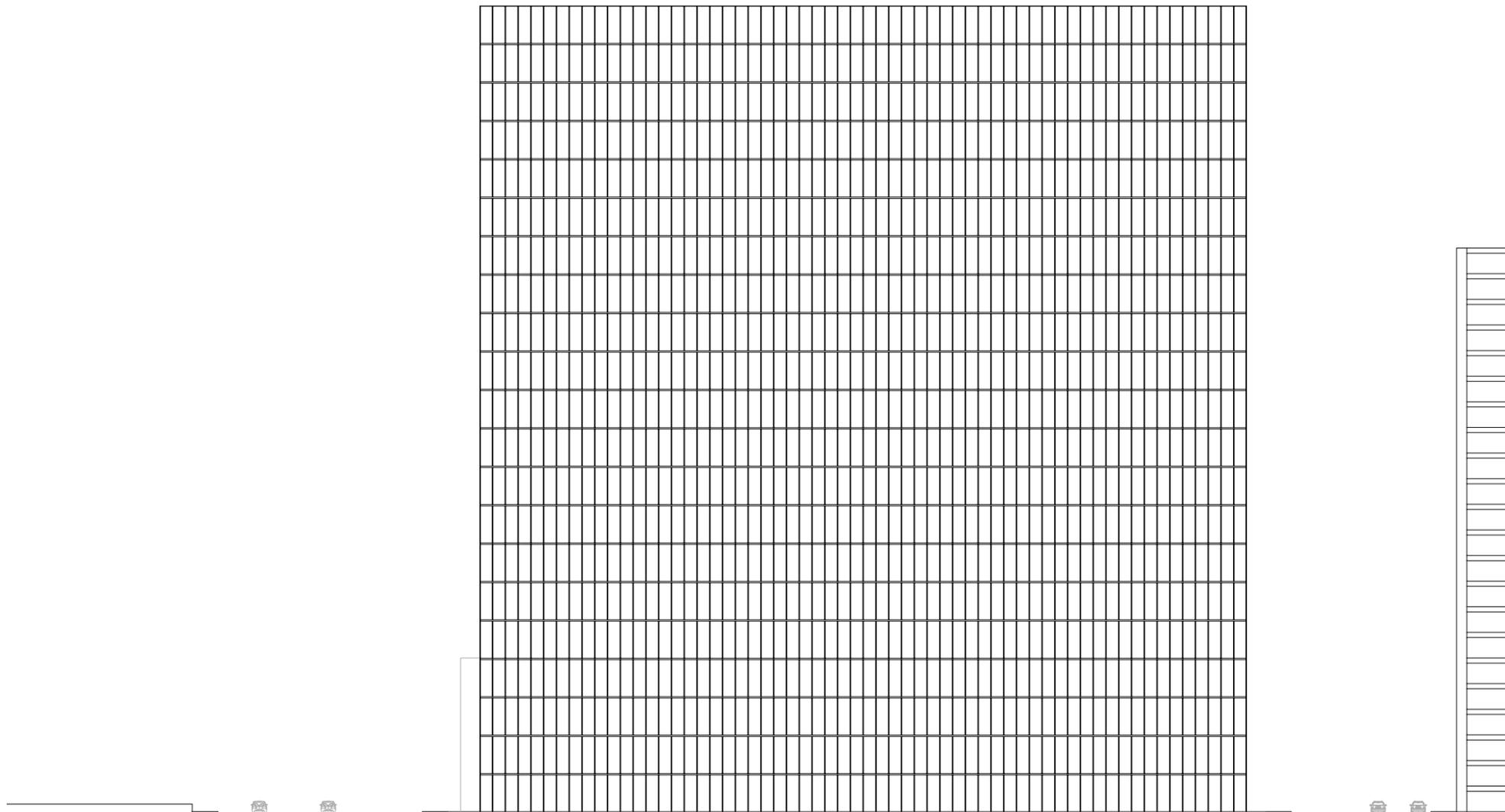
# Critica Finale

## Floor Plans



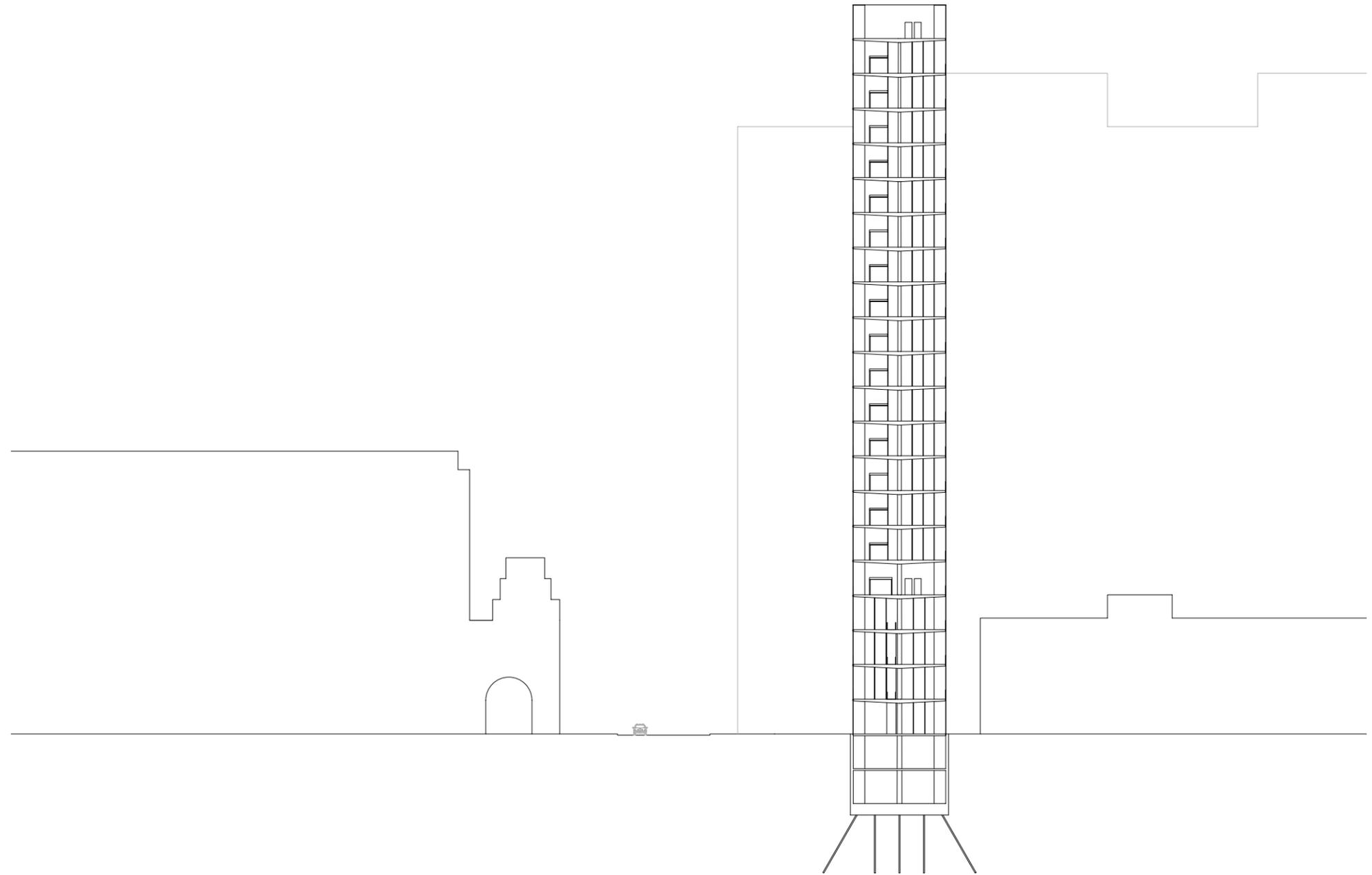
# Critica Finale

## Building Elevation



# Critica Finale

## Building Section



Luxury apartment building in Chicago, 5600m<sup>2</sup>  
Christopher Jones  
ISE 2017  
USI Accademia di architettura Mendisio  
Aster Vukobratovic

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# Vita

Christopher Shields Jones

Master of Architecture, Summer 2009

Virginia Polytechnic Institute and State University

Bachelor of Architecture, Summer 2007

Virginia Polytechnic Institute and State University

Chicago Studio 2005

Atelier Nikos Ktenàs, Winter 2006

Atelier Valerio Olgiati, Summer 2007

Università della Svizzera Italiana Accademia di Architettura  
academic year 2006-2007

Alpha Rho Chi

Superintendent, 2005-2006

Vice-President, 2005

Gamm Alpha re-charter class, 2005

Boy Scouts of America

Eagle Scout, 2000

Published Works

“The Virginia Auctioneer”

Cover Image, vol.20, no.1, Spring 2002

Thomas Jefferson’s Poplar Forest

Holiday Seasonal E-mail Greeting Image, 2008

Alpha Rho Chi

Honorable Mention, 59th Convention Logo Contest, 2005

“The Virginia Auctioneer Membership Directory and Resource  
Guide”

Cover Image, 2006, 2007, 2008

“America’s frontier has never been wholly erased. Even after the national territory had been fully settled, it was constantly being reinvented.” (Beauregard, p. 15)



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