

Space: Working and Living

Separation and Integration of the two



Space: Working and Living

Pankaj Mahajan

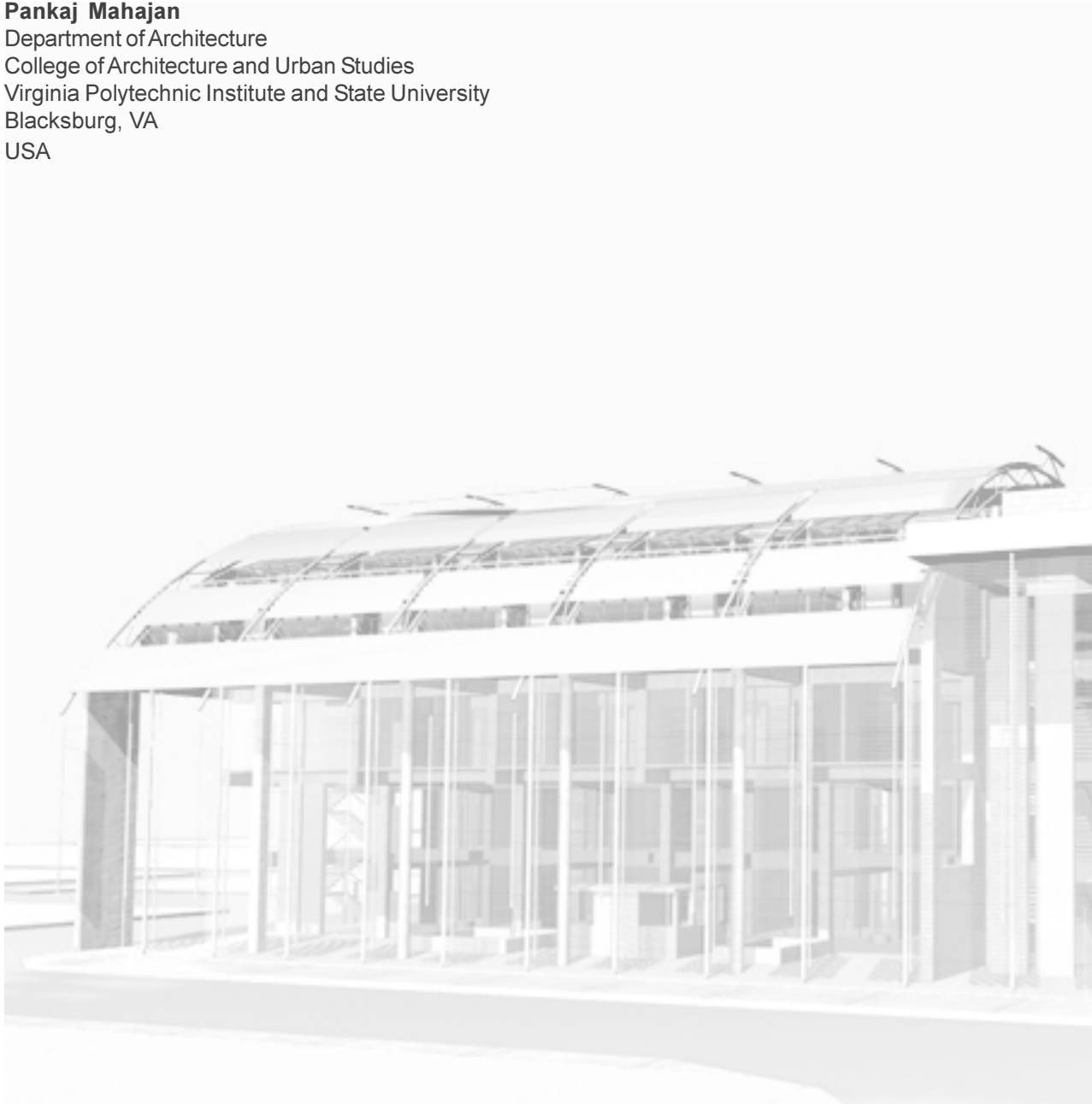
Department of Architecture

College of Architecture and Urban Studies

Virginia Polytechnic Institute and State University

Blacksburg, VA

USA



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Michael O'Brien, Chairman

William Galloway

Jim Jones

Table of Contents

2	abstract
3	the idea
5	the site - reading the site
9	defining the project - reading the corners - mass division
17	structural order - primary and secondary structure - structure elements - facade elements
25	project drawings - plans -section
35	making the project - courtyard - main entrance - main lobby - shops - interior plaza - offices - apartments - roof
55	light and space
57	layers
65	project photographs
76	bibliography
77	acknowledgment
78	vita

abstract

what is architecture?
what defines space?
how do you define separation and integration of spaces?
what is the relationship of human scale to space elements?
how can architecture be studied?

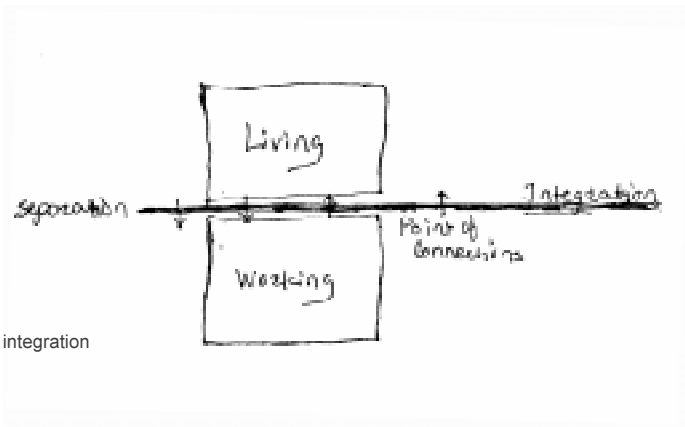
Architecture is a combination of science and art to make spaces for human needs and activities. What can an architect do to make a project, a building, not only serve its purpose but to go beyond that? A space supports human desire and imagination. Architecture provides the means and methods to make the spaces. The elements of the structure, column, wall, beam, and floor, play a very important role in defining and/or dividing a space. A room can be defined by four walls, columns or even beams. The material of the floor also outlines space. Walls, a series of columns, or ceiling beams can define an edge or enclose space and differentiate its meaning and function. The understanding of these elements and their relationship with each other and with people is the purpose of this study.

In an urban situation often there is a need to design buildings with spaces for multiple activities. Separation of spaces and functions, as well as integration of different parts, is vital in such a design. Columns and walls enclose the space and characterize privacy. Their material and its characteristics make the edges of space opaque, transparent or semitransparent. The dimensions of columns and beams show the scale of the space, constraining the relationship of the people to the structural elements.

the idea

Providing physical separation with functional and visual integration of both offices and apartments in the same building is the idea of this project. What is different about these two conditions, working and living? Each has its own requirements. Public spaces like shops are approachable by everyone, offices are somewhat restricted and private spaces such as apartments have very limited access. In this project I tried to combine these public and private spaces. Their relationship with each other, points of connection and separation are key issues in the project. Outdoor public spaces are important for people to loiter and relax in addition to make the transition from street to indoors. Since the project has commercial shops and offices, pleasant outdoor and indoor public spaces are needed. The apartments must have their privacy and closeness. The access to the apartments and transition from commercial to private is substantial for apartments.

My aim in this project is to design a space which not only satisfies the requirements of the different parts of the project, but also enhances the living and working conditions of human beings.



living and working spaces: separation and integration

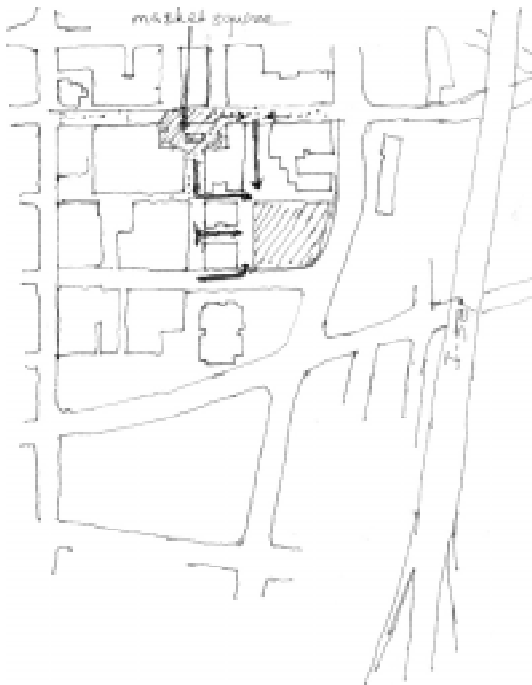
<u>Living</u>		<u>Working</u>
- comfort	→	open
- privacy	→	access to other people
- openness & closeness	↔	openness & closeness
- closed	→	security in of office
- security feeling	→	
- nighttime	→	- Day time

living and working spaces: requirements

the site

The city of Roanoke is a small city in the state of Virginia, US with a population of about 230,000. The Roanoke downtown is typical for a small city with commercial and historical districts growing and living together. The site is in the middle of the city located near to the market square. The market square is the central part of the downtown with restaurants, coffee shops and bars which generate the flow of people to help make this proposal a success. The site, which is currently used as a parking lot, is surrounded by historical as well as contemporary tall office and bank buildings. An interstate highway (I-581) passes by the site which serves the purpose of car access to the downtown. It also generates the traffic noise and potential visual discomfort for private spaces.

The roads surrounding the site and people access to the building demand the site to extend its existence to accommodate downtown activities and create the space to make the transition from downtown to the interior of the building. The extended site is shown in the siteplan on the facing page.

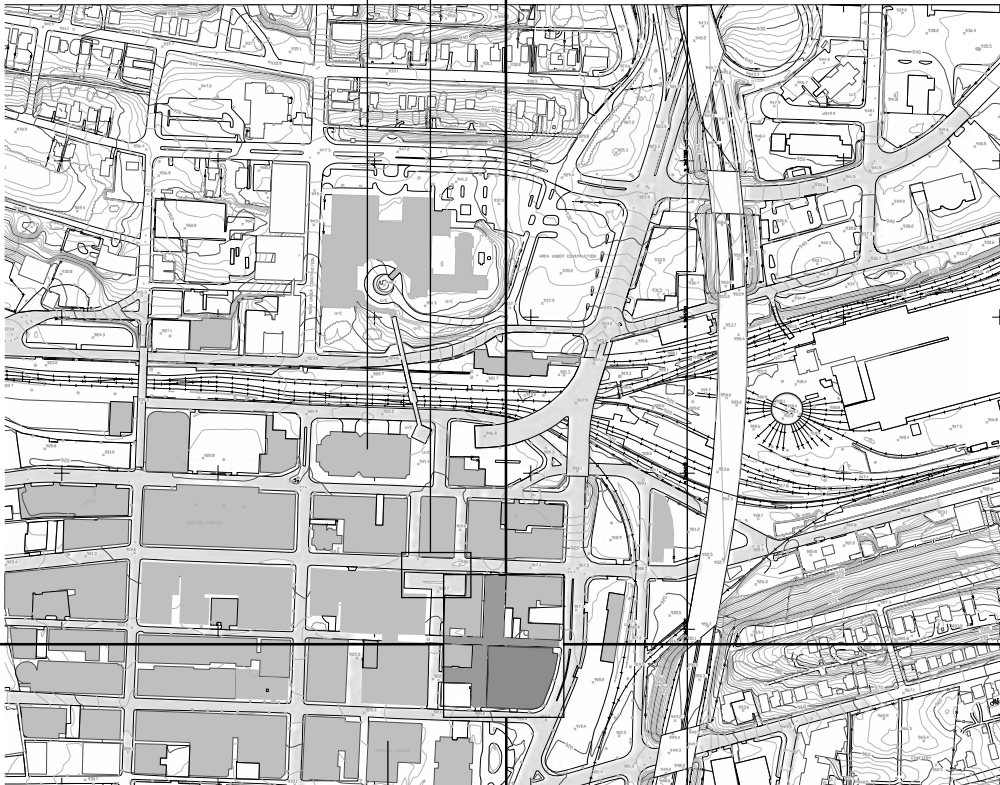


site; the movement of people



first union bnk

market square



parking garage

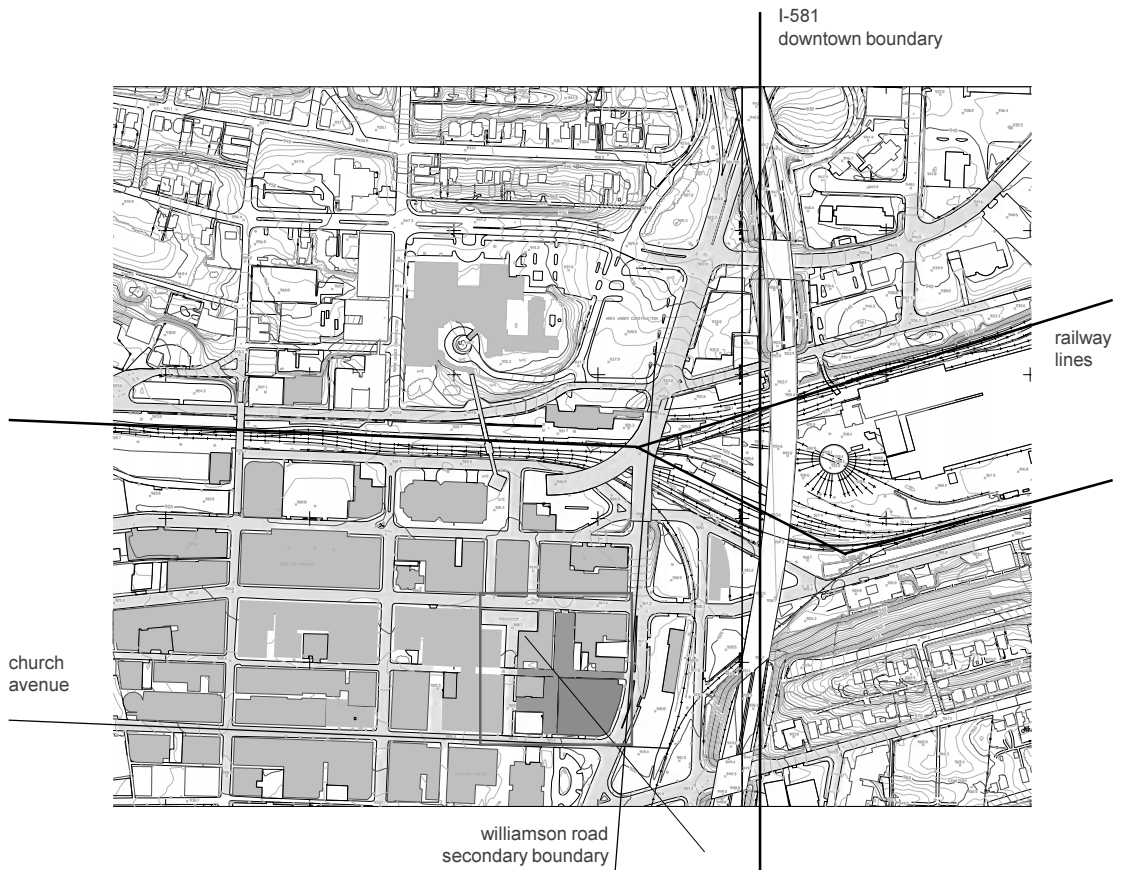


the site
-existing parking lot

reading the site

The interstate highway outlines an end of the downtown and Williamson road on the east side defines the secondary boundary of the downtown. On the south side commercial railway lines mark out the end of downtown area. All the downtown activities are centralized in the market square and its immediate surroundings. Further on the west side of the site (i.e. along church avenue) government offices and administrative buildings are located. On the south side of the site, the downtown seems to dissolve into the neighbourhoods in a short distance.

The commercial character of the surrounding buildings determines the scale of the project and its structural elements. The east and south sides of the site are bounded by the city streets, Williamson avenue and Church road and the west and north sides are bounded by a small wide road and Kirk avenue. The site has relationships to vehicles and downtown streets on the east and south sides and to the pedestrians on the west and north sides.



site surroundings

main boundaries



church avenue



williamson road



kirk avenue

people access roads



west access



west access



north access

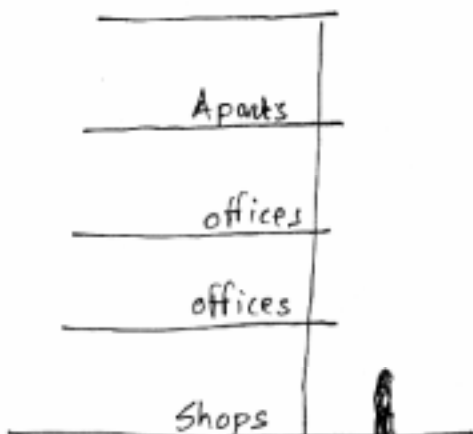
defining the project

The proposal outlines a building with shops, offices, apartments and a parking facility. According to the needs for privacy and access, shops are placed on the ground floor, the offices on the 2nd and 3rd floors and finally the apartments on the fourth and fifth floors. The parking facility is provided in the basement.

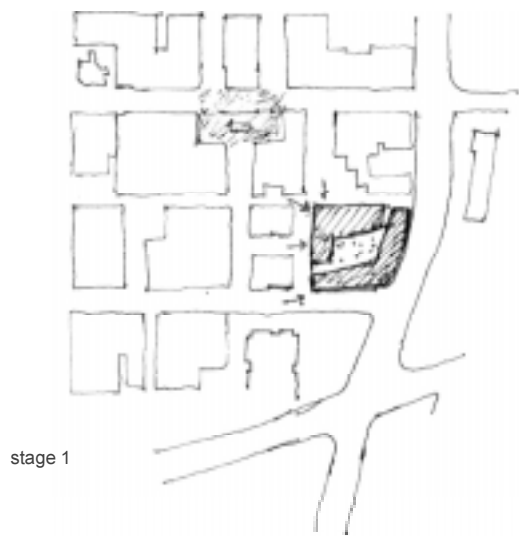
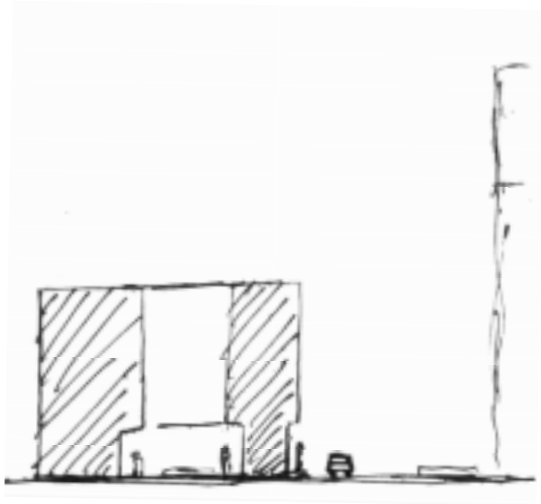
The design started with making a public space (courtyard). The development of the idea of the building is shown on the facing page. Stage 1 shows a courtyard in the middle of two buildings placed on the northeast and southwest sides. This option closes the courtyard for the people coming from the northwest corner which may not be appropriate for the shops and restaurants.

Stage 2 shows a more open courtyard for the pedestrian access with the building extending towards the courtyard. Now the courtyard provides an open and inviting public space for downtown. The covered plaza space is open to outside, but the courtyard seems to extend through the plaza. There is very little space available on the main road sides in this option and the stepping forward of floors suggests that the building should be facing south to shade the interior during the summer and getting the sun in the winter.

Stage 3 is the approach taken where the courtyard is in the northwest corner, and the building has two wings with separate curved roofs and a central space connecting the two wings. The building extends towards the main roads on the south and east sides, where the scale of the structural elements of the interior plaza make the connection with the cars and trucks. The thin steel columns on the courtyard side relate to the people. The interior plaza now facing the streets provides a view and winter sunlight coming through the glass facade. Also it provides an indoor public space for the shops and offices and a winter garden.



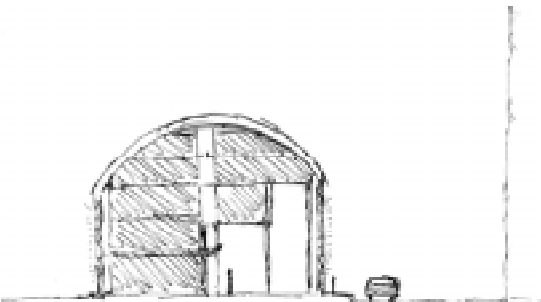
Because of the importance of the market square and people coming to the building the space adjacent to the site needs to be developed further in the north and west direction.



stage 1



stage 2

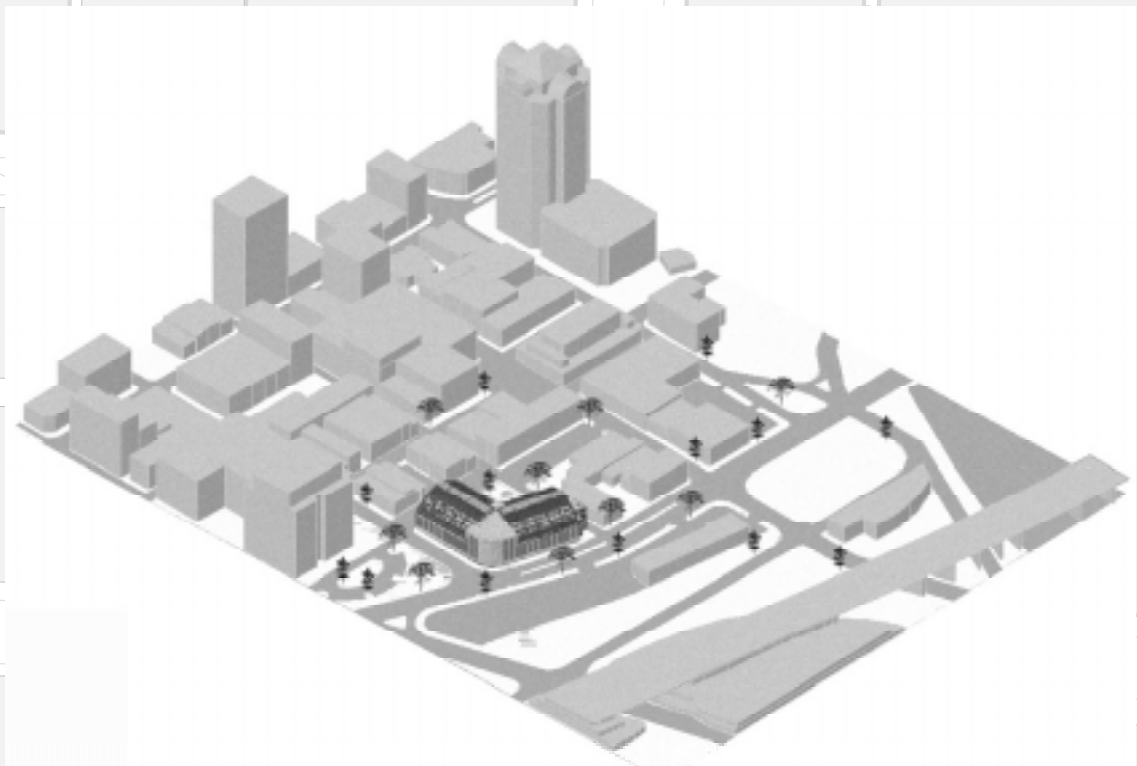


stage 3

920.8

corners

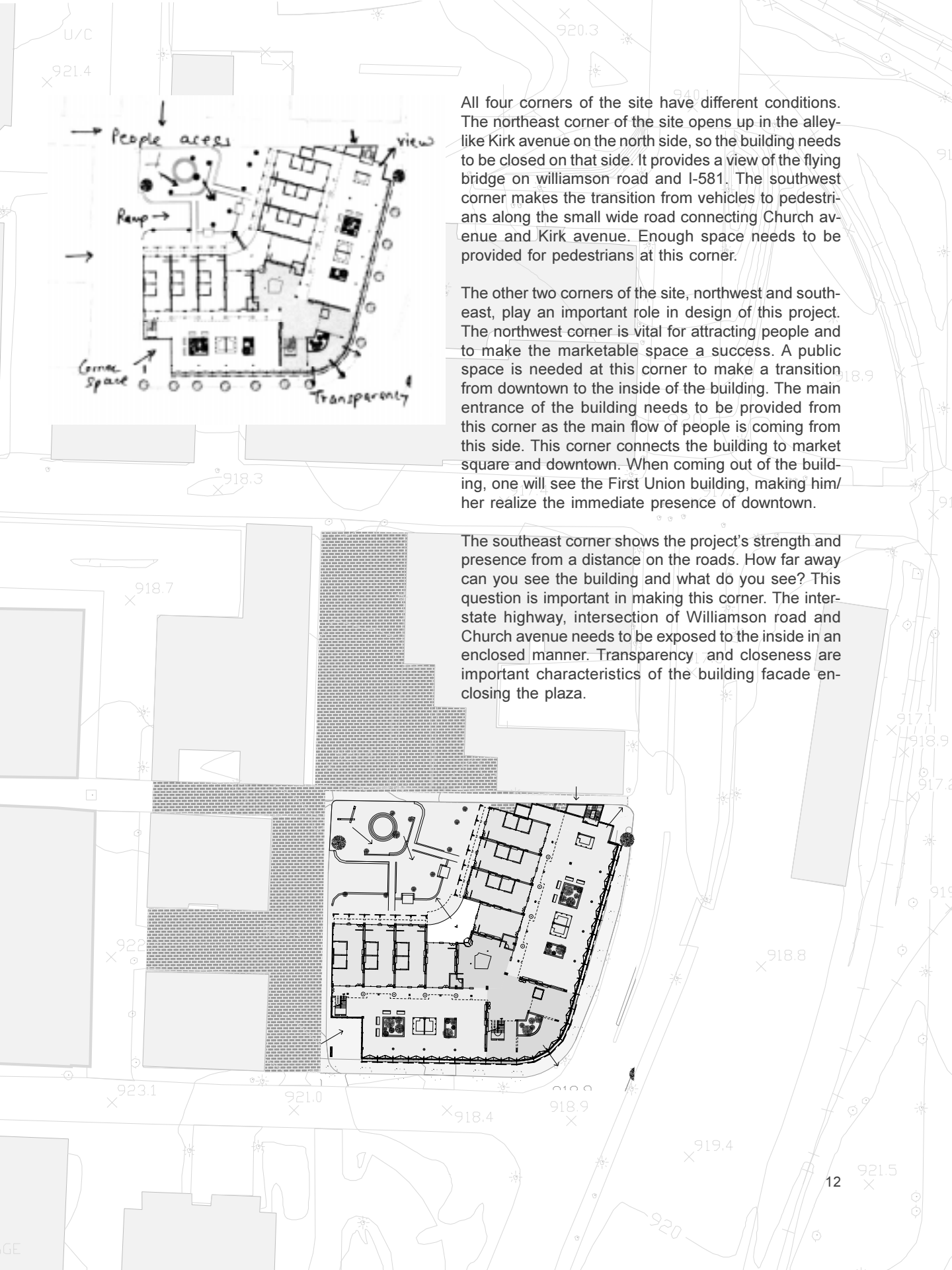
ROOFTOP PARKING



All four corners of the site have different conditions. The northeast corner of the site opens up in the alley-like Kirk avenue on the north side, so the building needs to be closed on that side. It provides a view of the flying bridge on Williamson road and I-581. The southwest corner makes the transition from vehicles to pedestrians along the small wide road connecting Church avenue and Kirk avenue. Enough space needs to be provided for pedestrians at this corner.

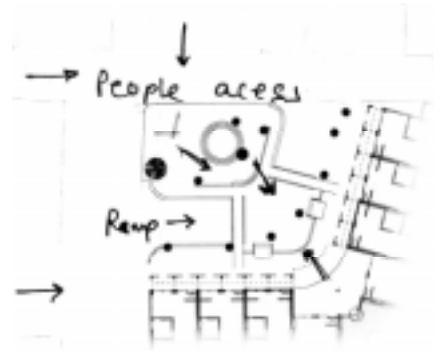
The other two corners of the site, northwest and southeast, play an important role in design of this project. The northwest corner is vital for attracting people and to make the marketable space a success. A public space is needed at this corner to make a transition from downtown to the inside of the building. The main entrance of the building needs to be provided from this corner as the main flow of people is coming from this side. This corner connects the building to market square and downtown. When coming out of the building, one will see the First Union building, making him/her realize the immediate presence of downtown.

The southeast corner shows the project's strength and presence from a distance on the roads. How far away can you see the building and what do you see? This question is important in making this corner. The interstate highway, intersection of Williamson road and Church avenue needs to be exposed to the inside in an enclosed manner. Transparency and closeness are important characteristics of the building facade enclosing the plaza.

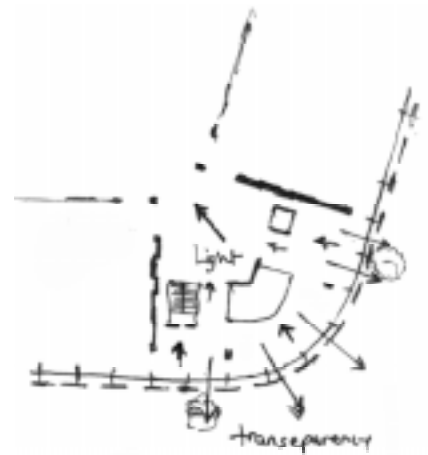


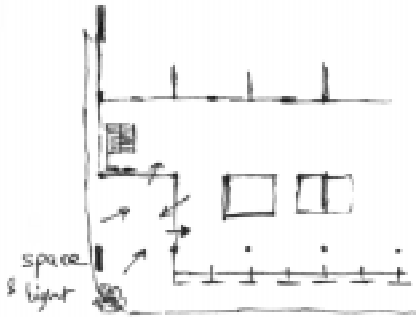


NW corner: courtyard (public space), people access and transition from downtown to the building inside



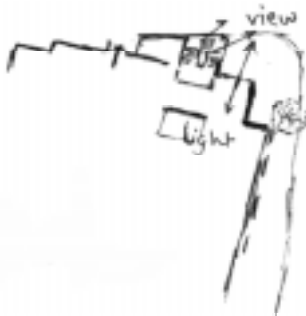
SE corner: light and transparency (Williamson road and Church avenue)





SW corner: space for pedestrians (Church avenue and the access road)

NE corner: closing wall, openings for the view (Williamson road and Kirk avenue)

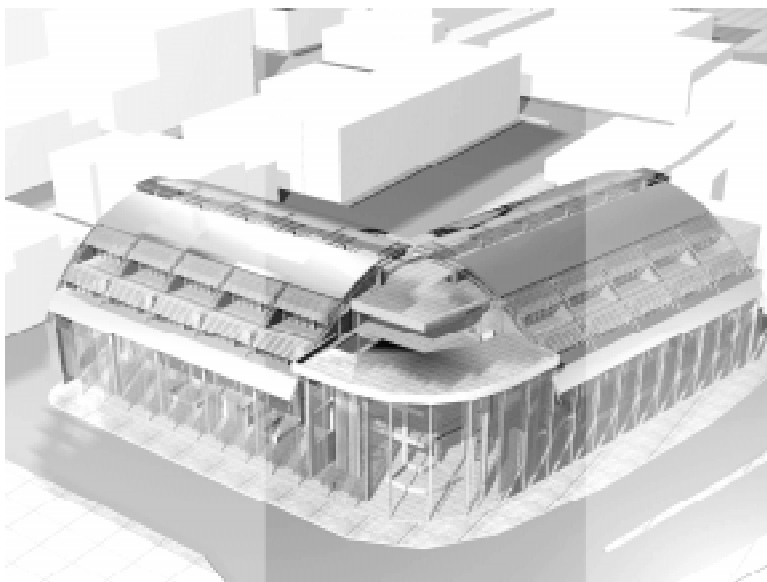


mass division

The building is divided into three main masses. Two wings with curved roofs are connected by a central circulation area with a flat roof which serves as circulation lobby. The two wings constrain the interior spaces, plaza and corridors. The central connecting lobby has accessibility elements such as stairs and elevator. It connects the shops, offices and apartments to main stair and elevator through corridors. It also contains the exposed mechanical and electrical ducts connecting the floors to the mechanical room in the basement.

The question of how you connect two masses together must become an architectural question. The joints between the two wings and main lobby and the connections between the curved and flat roofs of the masses become very important. The central mass (i.e. main lobby area) is different from the two wings according to function and space. The flat roof of the central mass makes the differentiation clear. The forces of the two wing's curved steel roofs try to collide when they meet each other, so the connecting mass with flat roof provides a better way to separate these two forces and also shows the differentiation in the spaces.

connection between the two wings and circulation lobby



northeast wing (shops, offices, apartments and plaza)
-curved steel roof



southwest wing (shops, offices, apartments and plaza)
-curved steel roof

connecting mass (circulation lobby)
-flat concrete roof

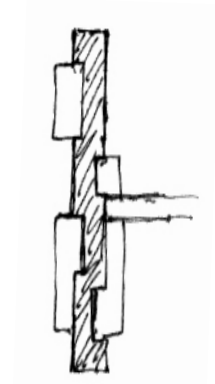
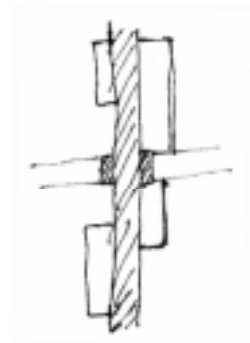
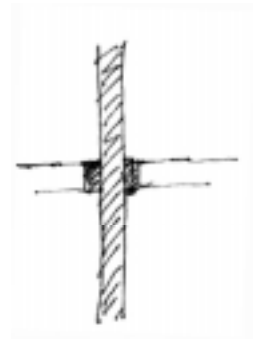
The 24'x24' grid represents the commercial scale of the site and drives the structural order. Columns and walls are placed on the grid, and then walls are displaced to accommodate the supply ducts and electrical wiring. The thickness of the structural wall makes the space for shelves, mantelpieces and wiring ducts. It also gives complexity and depth to the space defined by the wall.

The structural pattern is developed by placing a 24'x24' grid on the site. The grid is mirrored along the line going through the SW and NE corner so that it creates the facade line along with the edge of Williamson avenue on the east side.

The final pattern is a combination of walls and columns to make the separation of the spaces. The columns in the plaza are changed from rectangular to circular to soften the harshness of concrete and its edges. Exposed concrete walls divide the space and hint at the future division of the space within shops, offices, or apartments. The openings provided in the concrete walls can be closed or opened by partition walls to separate or combine the spaces.

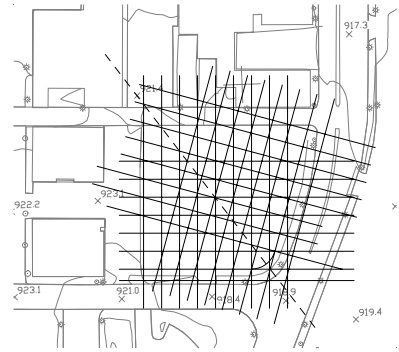
Floors are supported by concrete beams spanning between columns. The depth and shape of the beams show the characteristics of the structure and load supported.

structural order

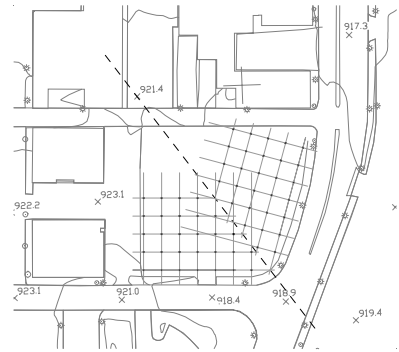


wall development

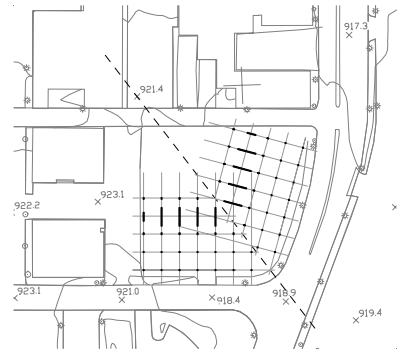
24'x24' grid placed on the site



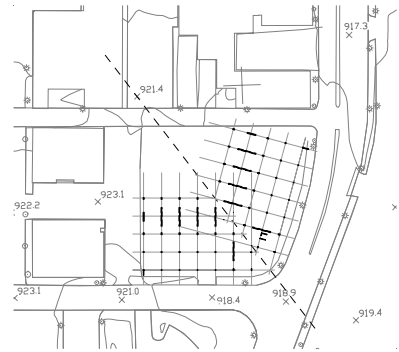
columns placed on grid



pattern of walls and columns



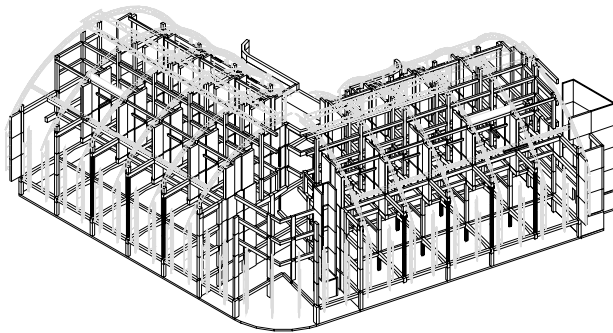
modified walls and columns to accommodate space



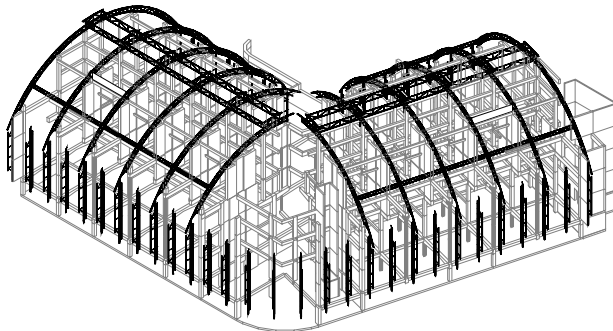
primary and Secondary structure

Concrete columns, walls and beams constitute the primary structure. Primary structure carries the main load of the building and transfers it to the foundation. Primary structure is responsible for dividing the spaces and defining the scale of the spaces. The material of the primary structure (i.e. exposed concrete) shows the rigidity and solidity.

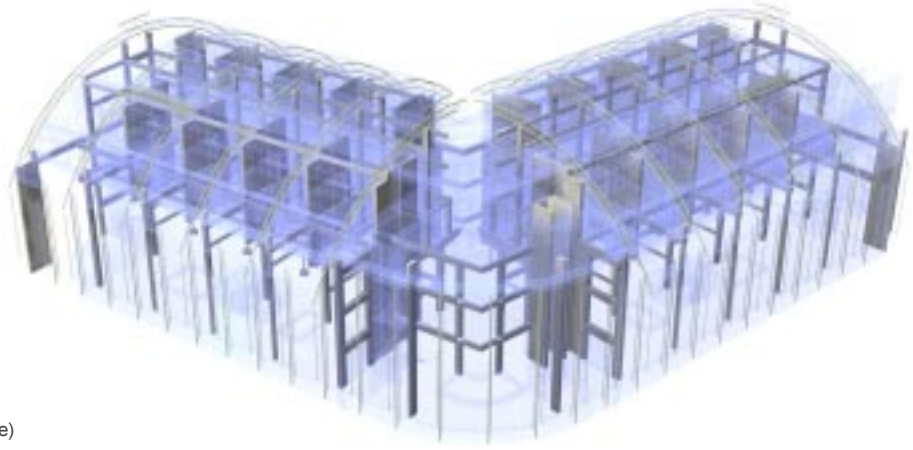
The secondary structure which forms the skin of the project is lightweight steel. Secondary structure (the steel truss) supports the glass facade on the south and east sides and also supports the metal roof and shades.



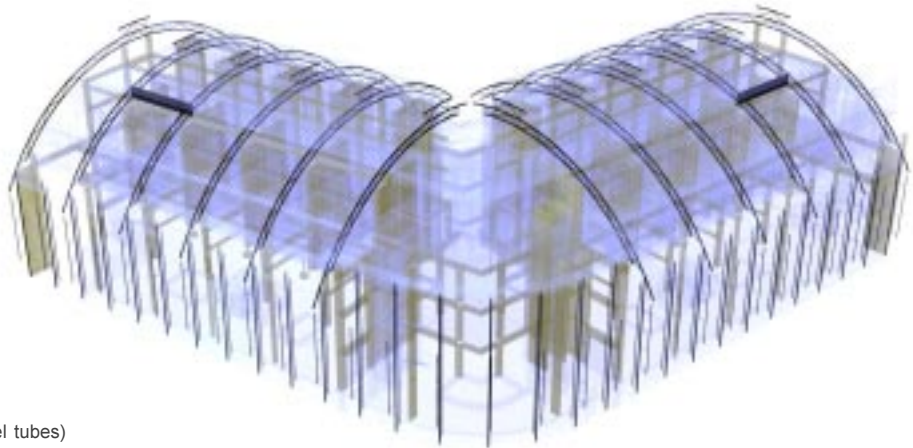
primary structure (columns, walls and beams)



secondary structure (facade and roof truss)

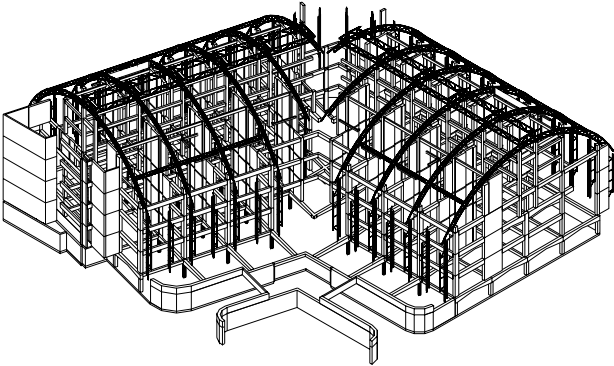


primary structure (concrete)

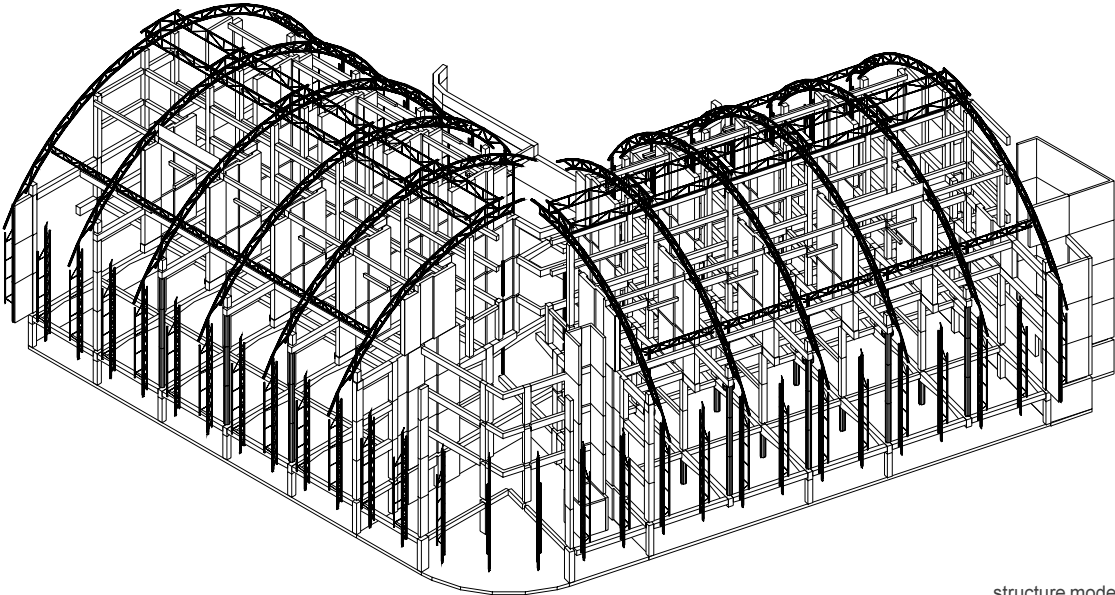


secondary structure (steel tubes)

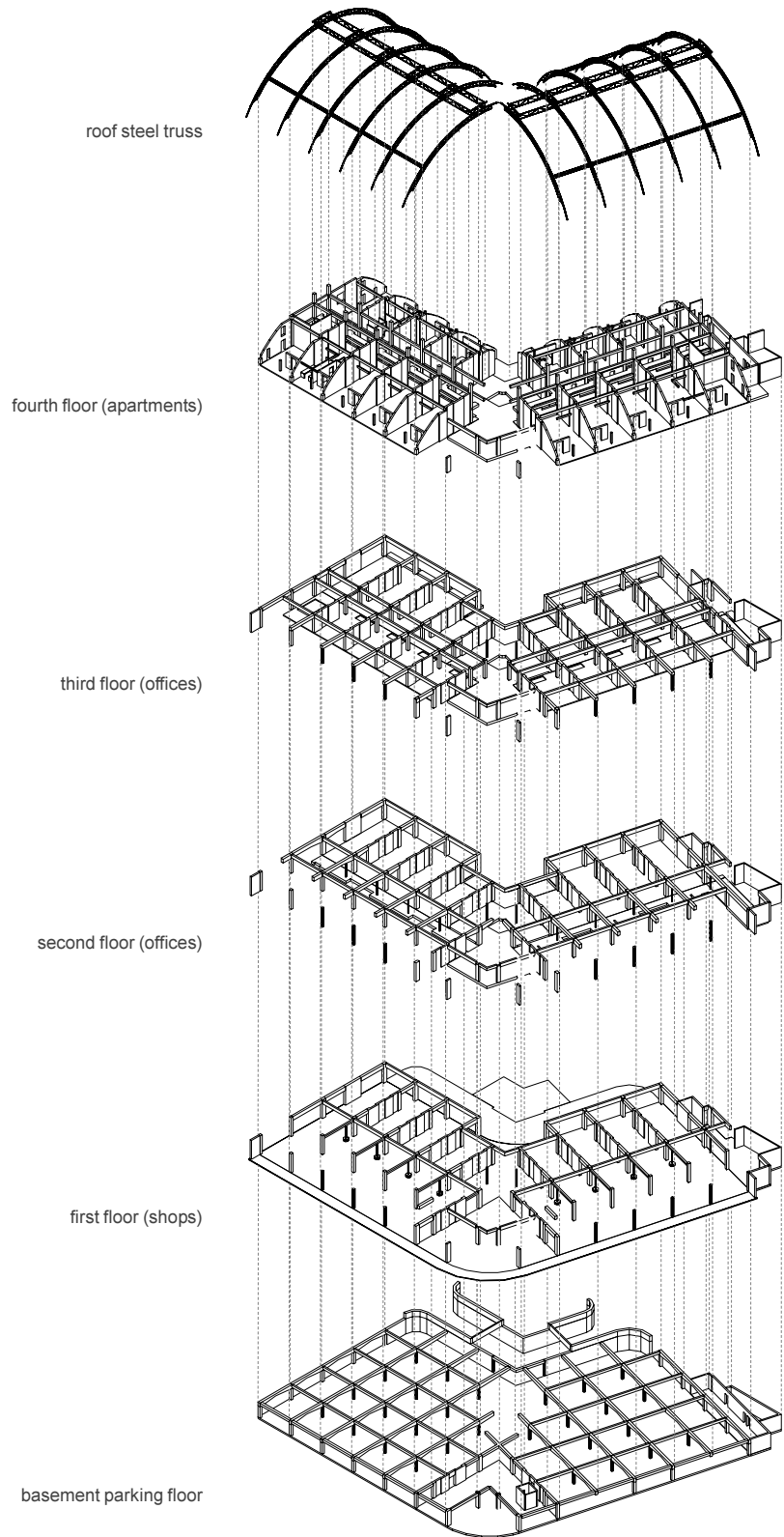
structure elements



structure from courtyard side



structure model



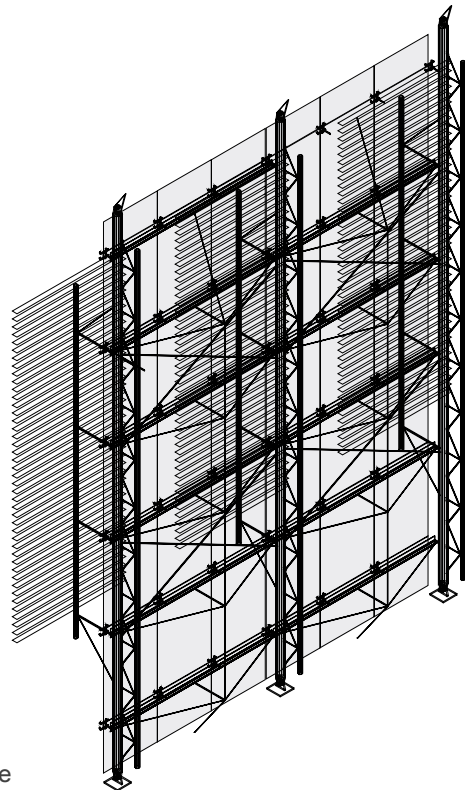
facade elements



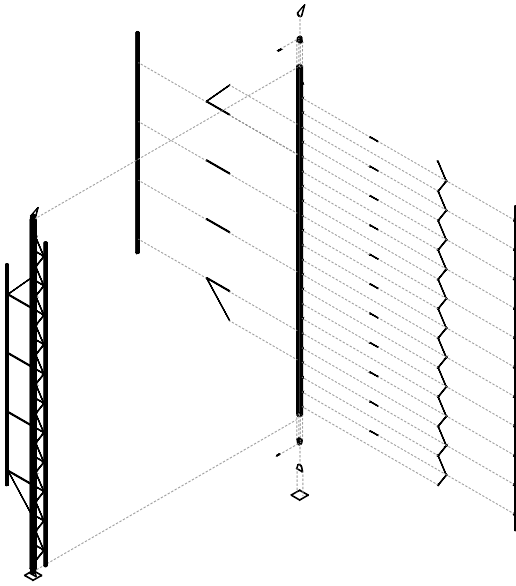
glass facade view

The glass facade enclosing the plaza is a complex mesh of steel tubes and cables supporting glass panels. The glass panels are held by spacers connected to steel column trusses through L shape steel angles. The shades provided block the sun and help to reduce the overheating of interior plaza.

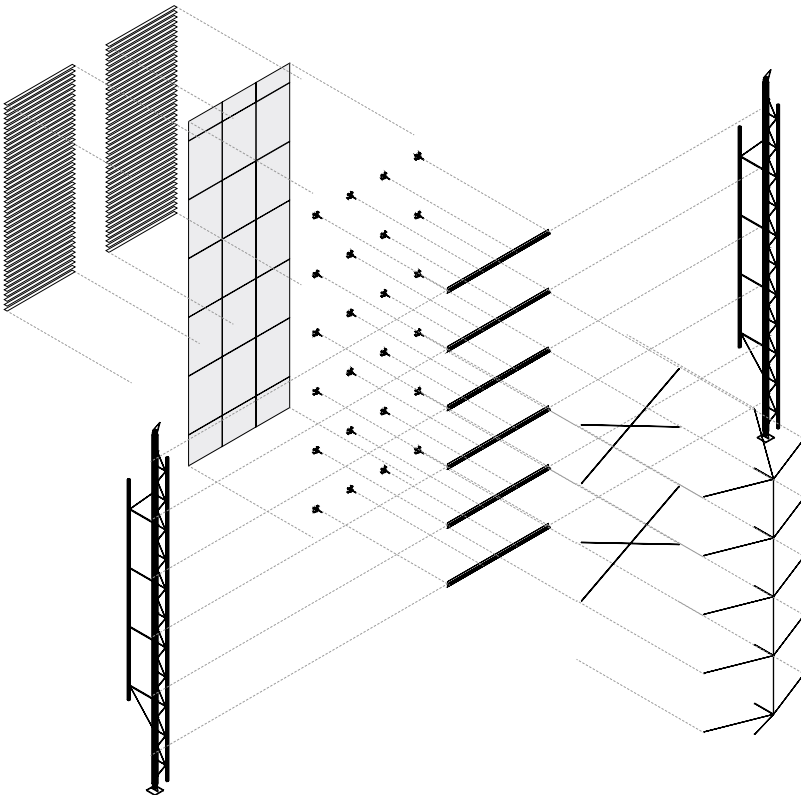
The slimness of the steel structure helps to make the transparency of the facade while the scale of the steel structure relates to people.



facade structure

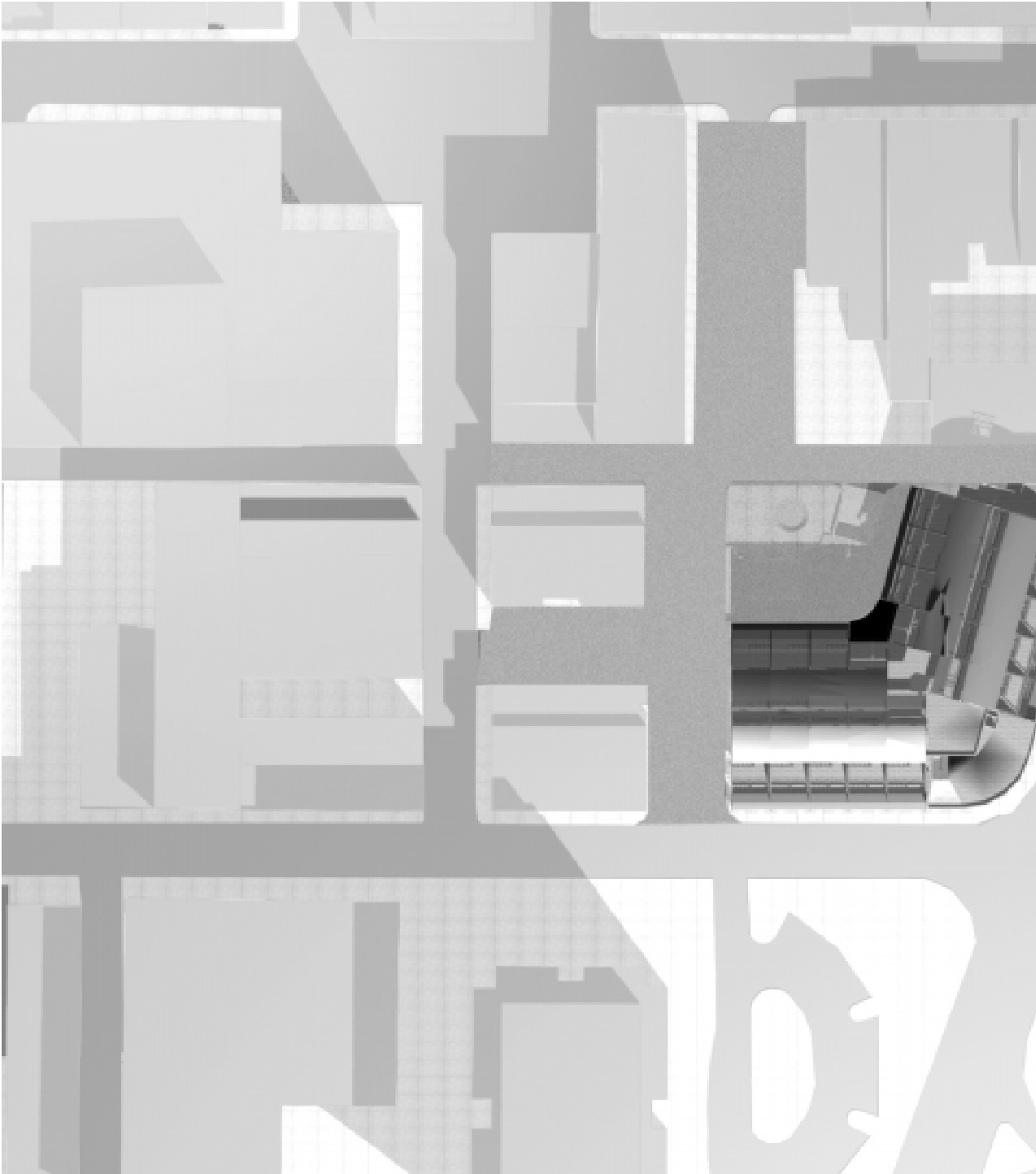


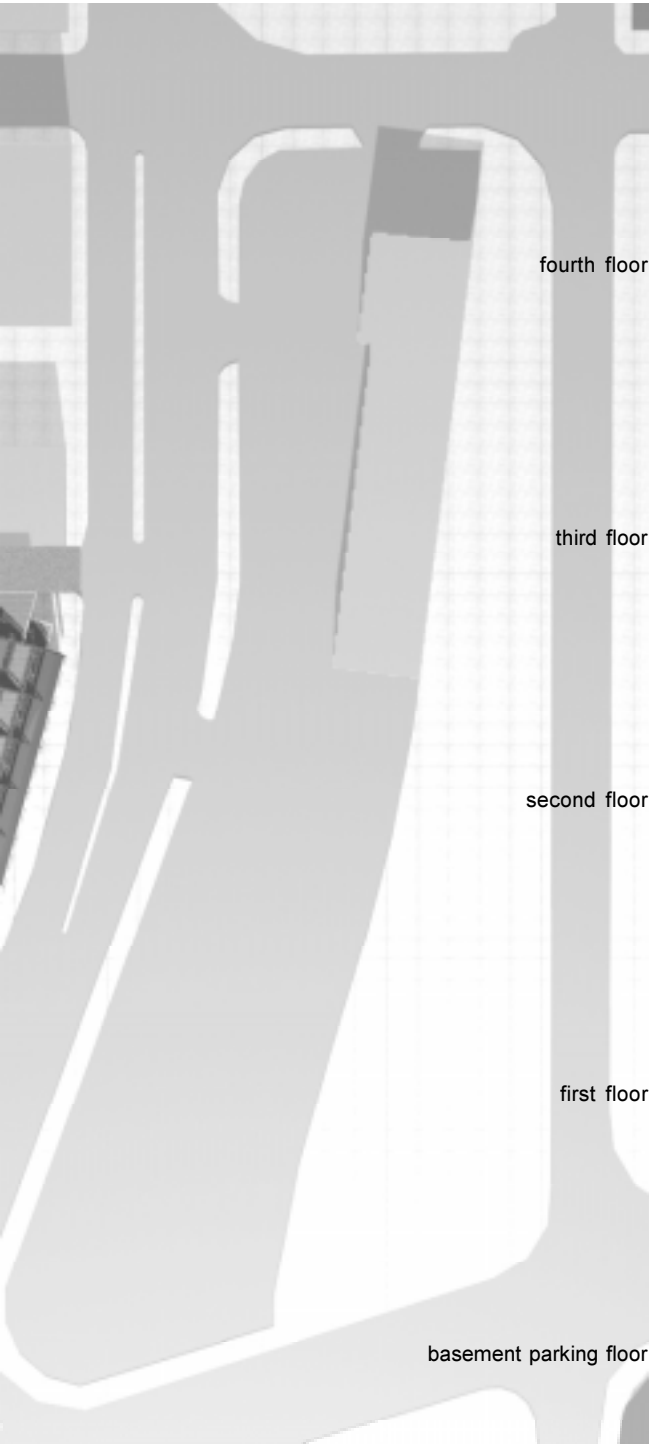
facade column assembly



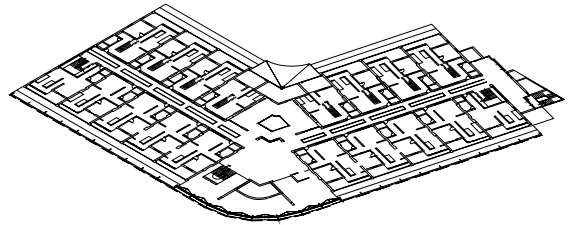
facade assembly

project drawings

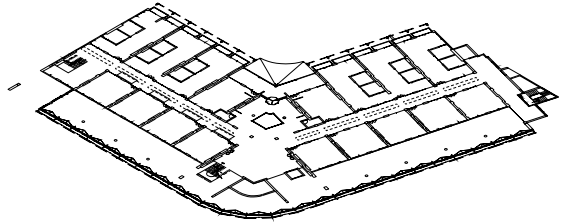




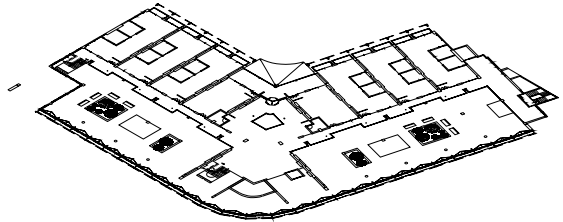
fourth floor



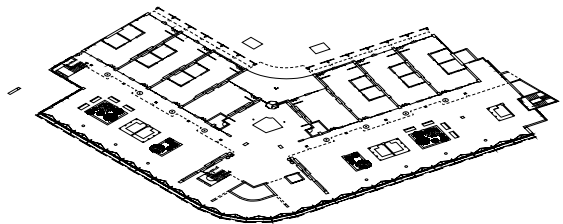
third floor



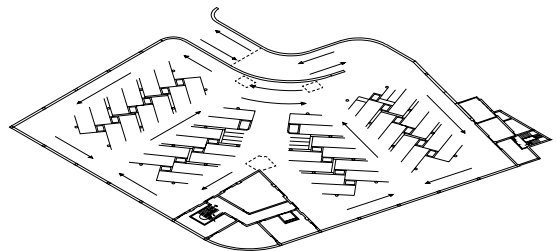
second floor



first floor

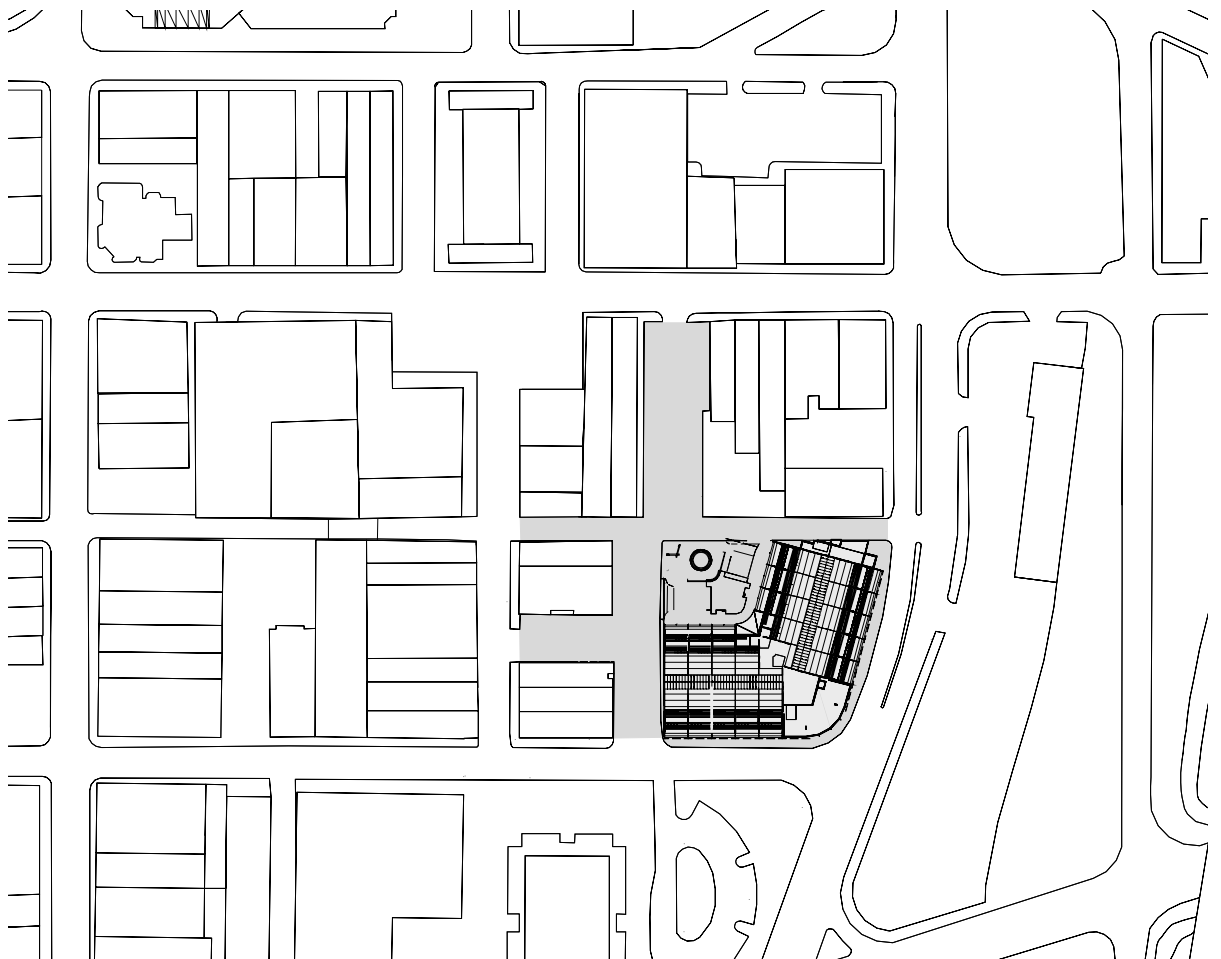


basement parking floor



plans

The plan is a map of the order of space. The architecture of a building cannot be defined without a strong order of spaces. The plan shows location of spaces, connections between them and the differentiation of the rooms and functions. The plan outlines the building in the horizontal direction, and section in the vertical direction.



parking floor plan

- 1 parking
- 2 ramp
- 3 mechanical rooms
- 4 service and storage rooms
- 5 elevator
- 6 courtyard



1st floor plan

- 1 main entrance
- 2 shops
- 3 interior plaza
- 4 central lobby (circulation space)
- 5 restrooms
- 6 service and storage rooms
- 7 courtyard

0 10' 25' 50'



2nd floor plan

- 1 offices
- 2 interior plaza
- 3 central lobby
- 4 office access corridor
- 5 restrooms
- 6 service and storage rooms

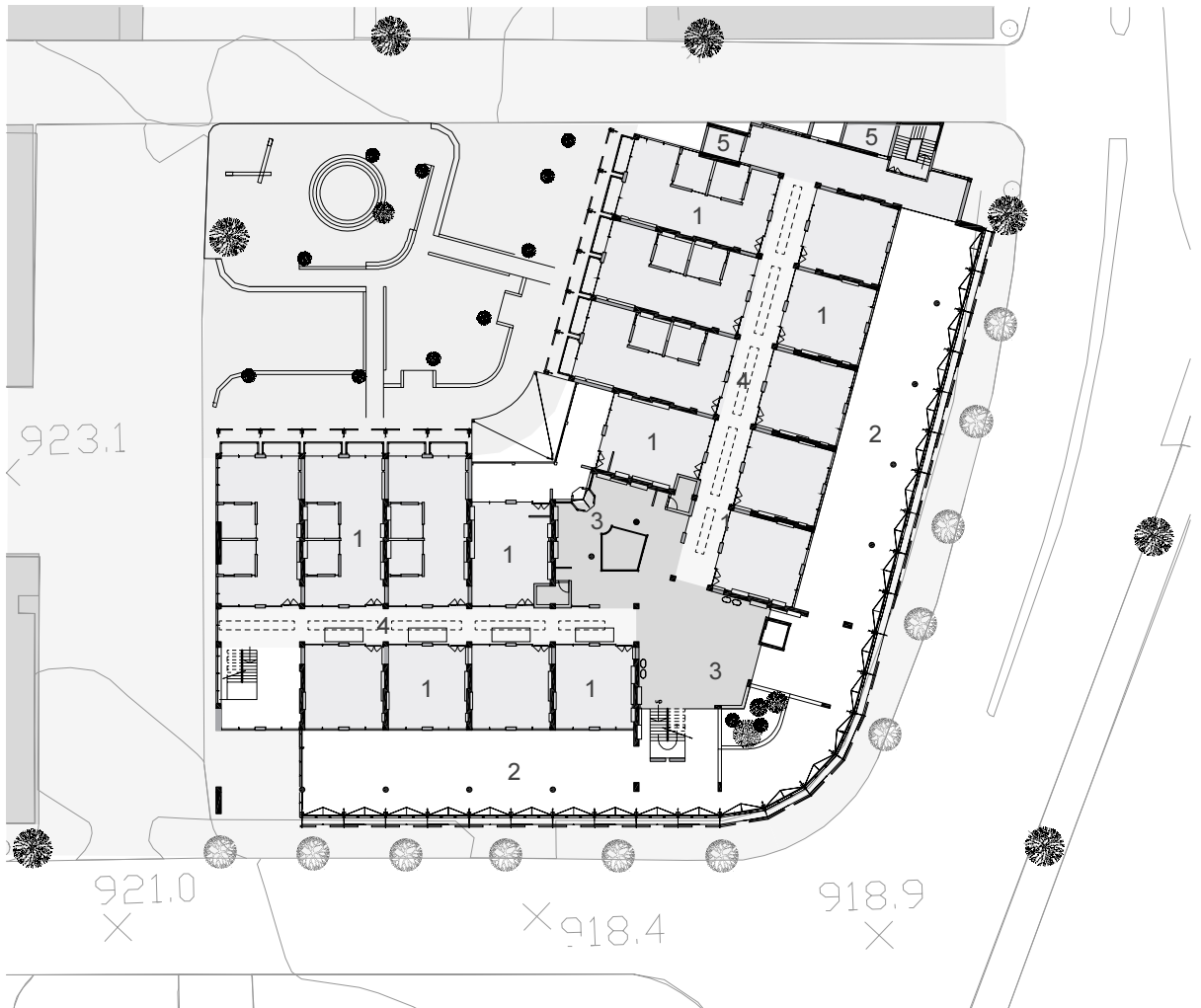
0 10' 25' 50'



3rd floor plan

- 1 offices
- 2 interior plaza
- 3 central lobby
- 4 office access corridor
- 5 service and storage rooms

0 10' 25' 50'



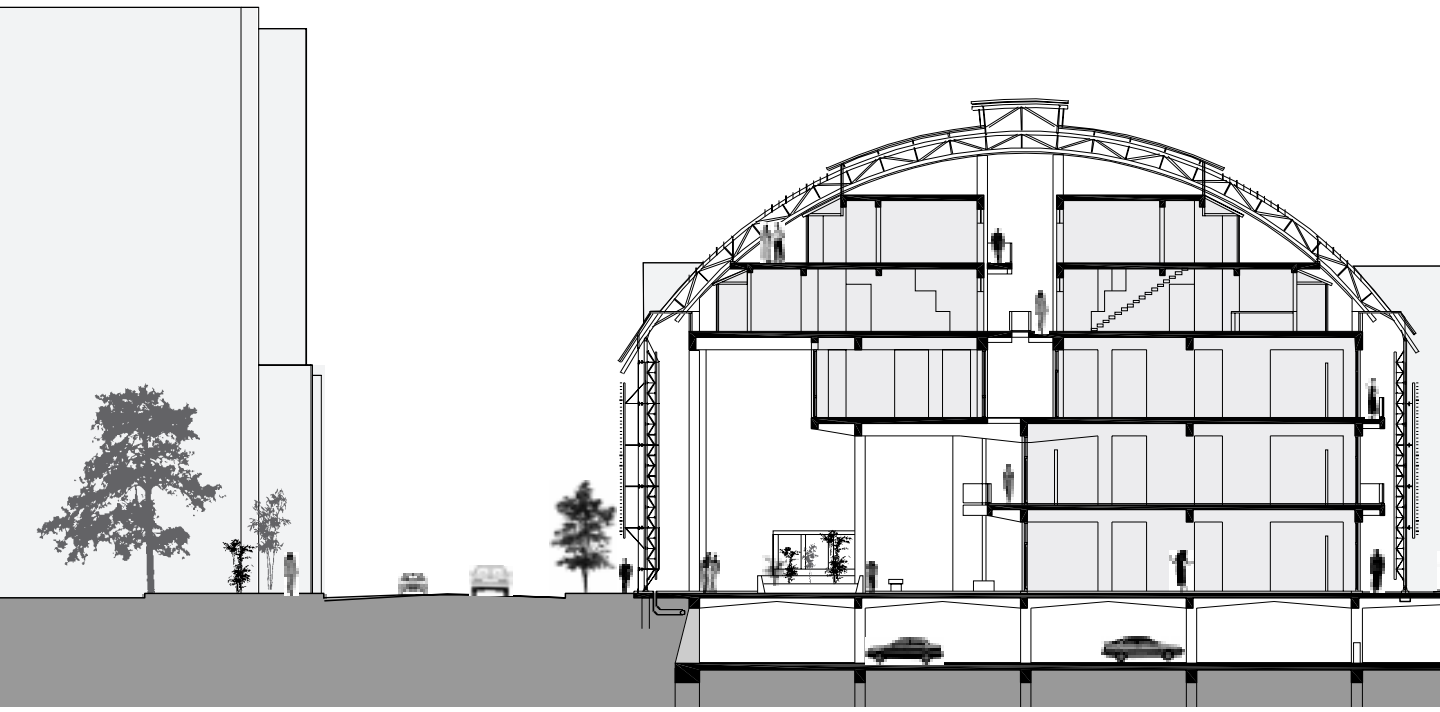
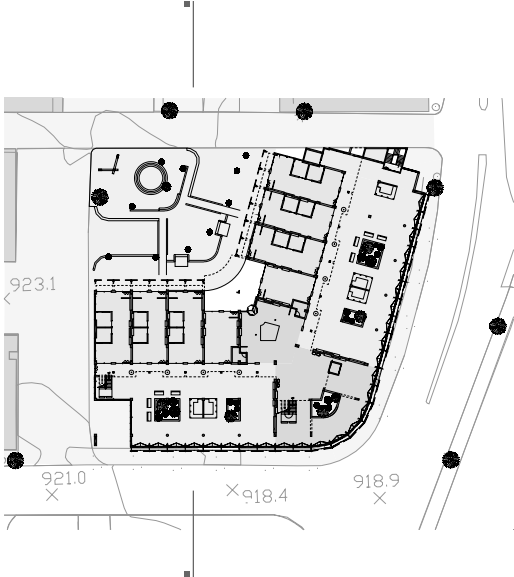
4th floor plan

- 1 apartments
- 2 apartment balcony
- 3 central lobby
- 4 apartments access corridor
- 5 service and storage rooms

0 10' 25' 50'

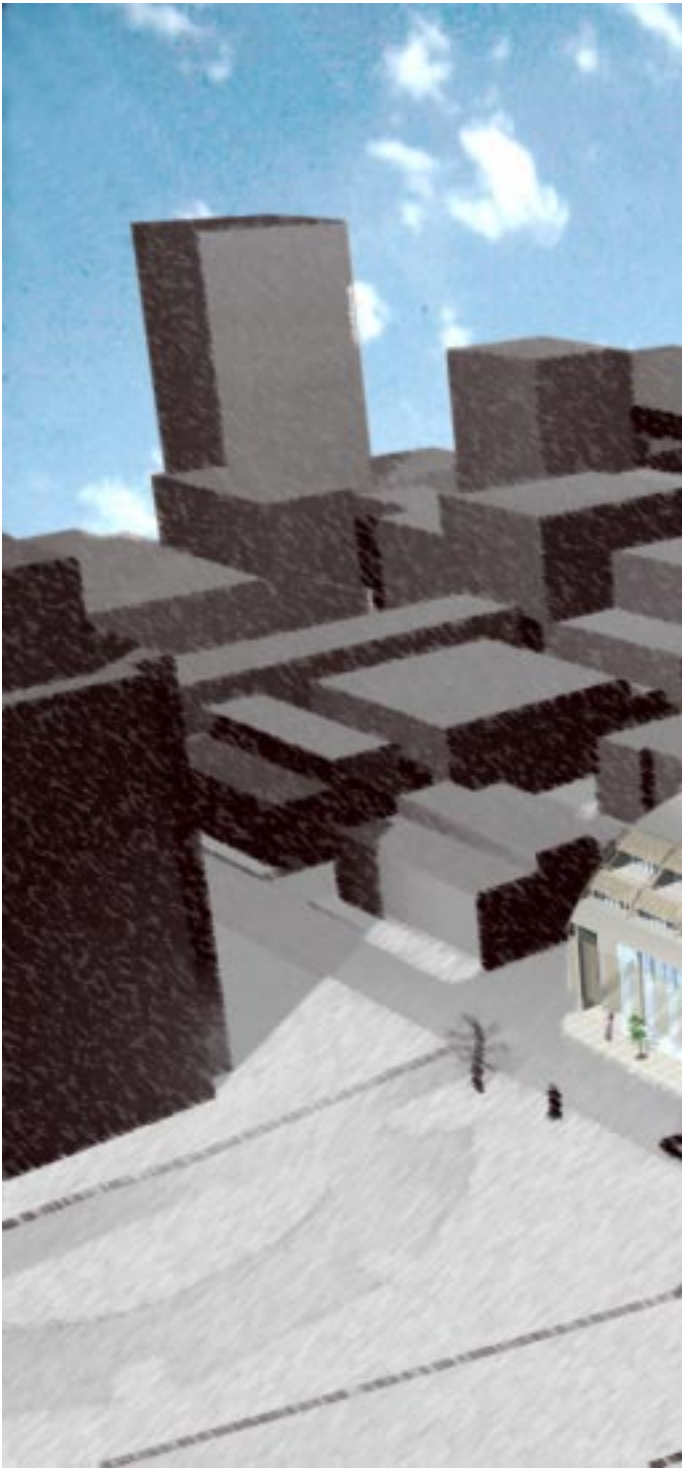


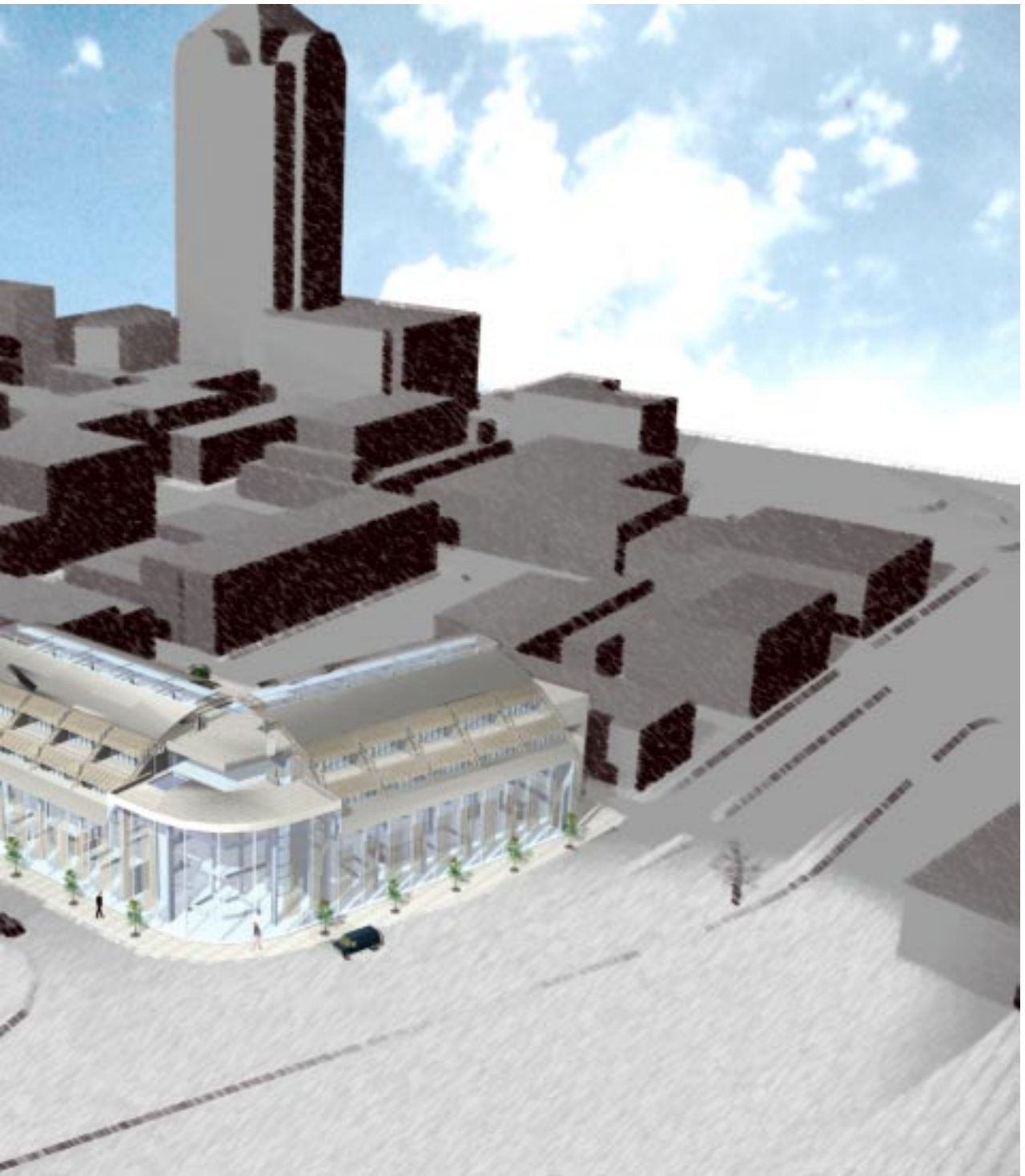
section



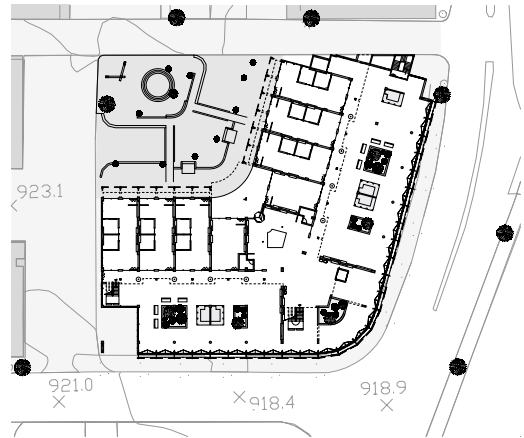


making the project

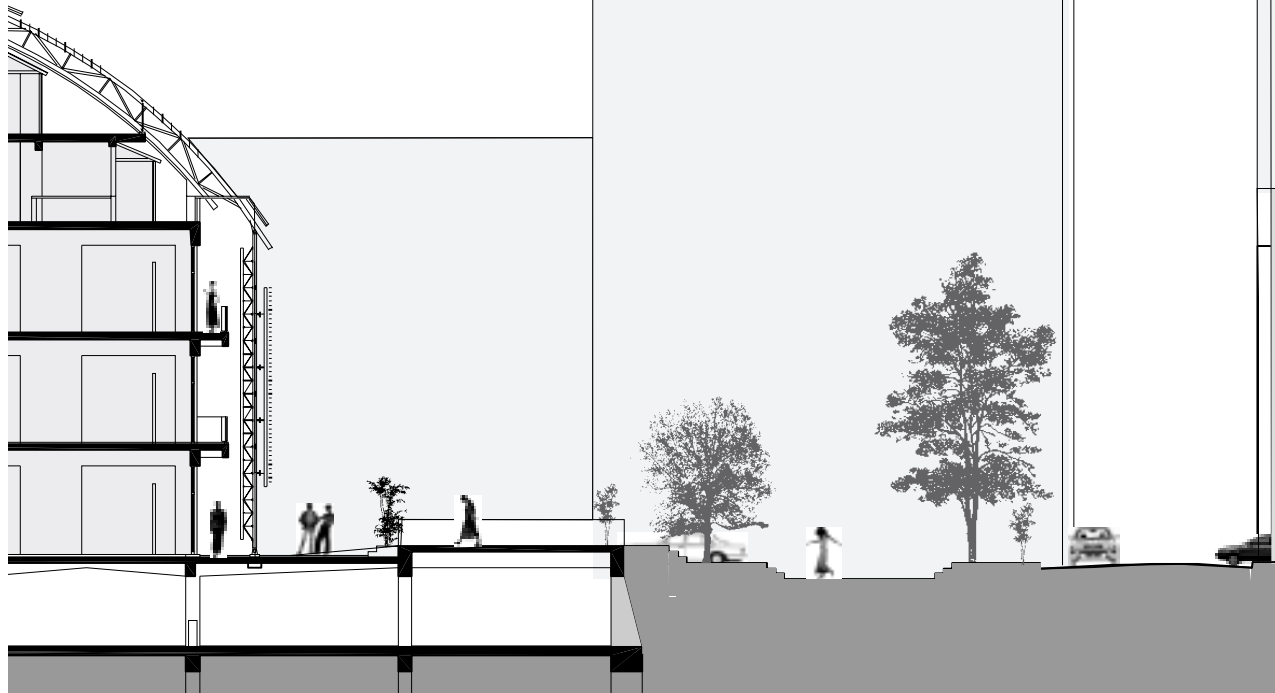




courtyard



As the major flow of people is from the market square, design of a public place on the northwest corner of the site and the pedestrian links to the market are the key elements in the project for the success of the shops and restaurants. The courtyard on the northwest corner provides a place for people. It serves two purposes: first, to provide the place for people to relax and enjoy the play of sun and shadow and to watch other people, cars on the street, as well as people working in the building, and second, to provide the buffer space which belongs to the streets of downtown as well as to the building itself. The transition from downtown streets to the inside of the building is addressed by the courtyard.





courtyard view

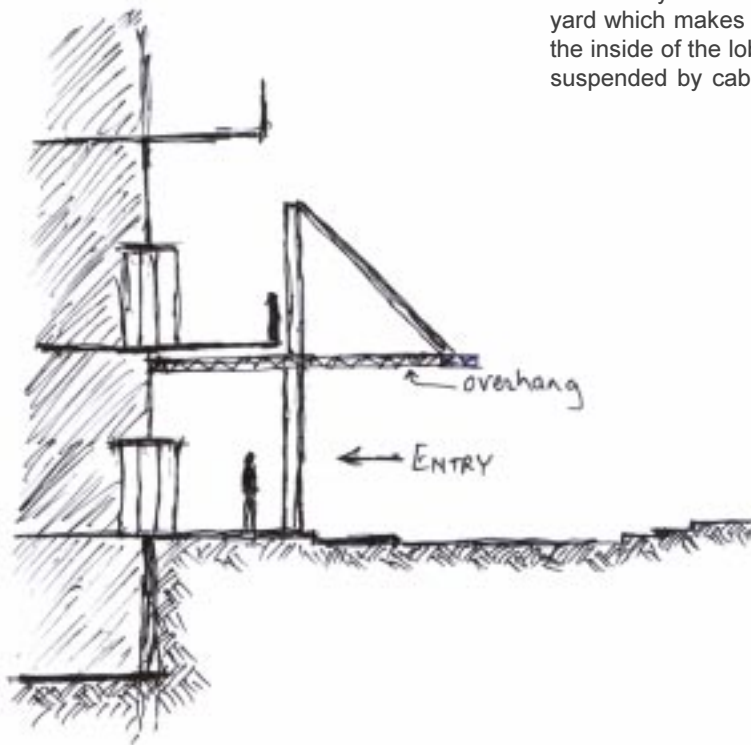
rear facade view



main Entrance



The building can be entered from all directions, but the entrance from the courtyard side provides the main access to the building. It connects the circulation lobby area to the shared public space (i.e. courtyard). It is covered by a metal roof projecting towards the courtyard which makes the transition from the courtyard to the inside of the lobby. The roof is a separate element suspended by cables from steel tube column.





main entrance from the courtyard

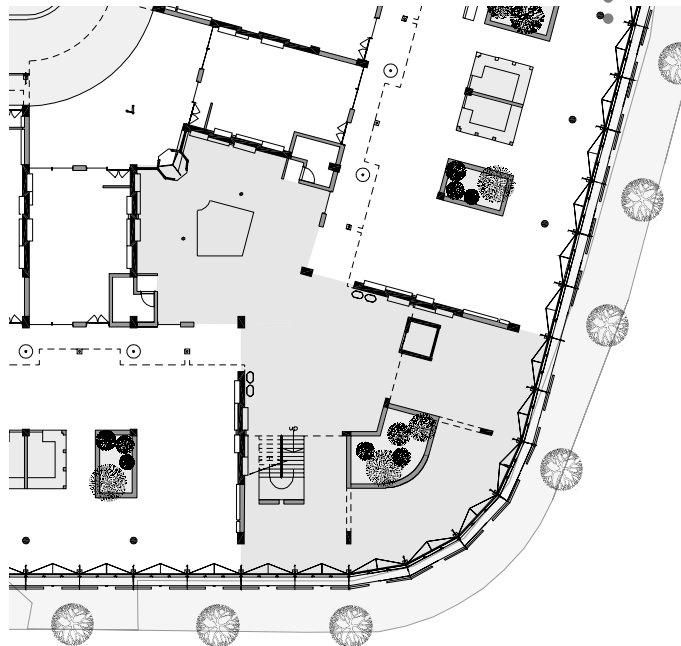
entrance lobby



main lobby



The circulation area (i.e. main lobby area) provides the connections between the corridors, plaza and the upper floors. It consists of the reception area, main stair and elevator. Most of the traffic of pedestrians coming in the building is directed through this space. The south-east corner glass facade encloses the lobby area to develop the transparency of the corner. The floors are pushed back to make a vertical space in the corner. The verticality of the space characterizes the scale of the floors to the people.



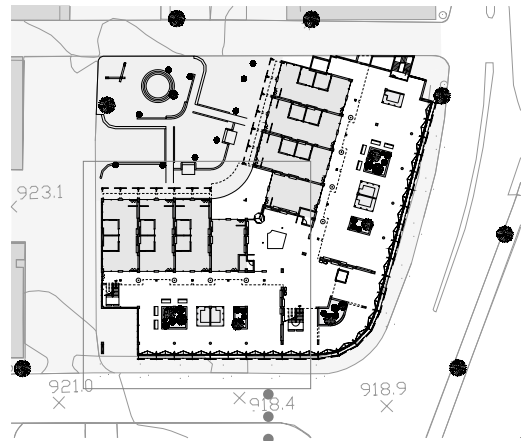


main stair in the lobby

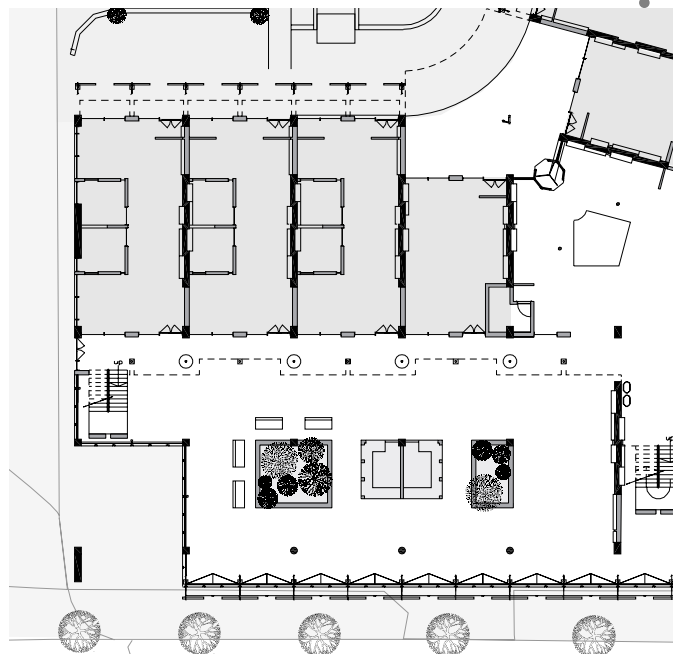
southeast corner view (transparency of the corner)



Shops



The shops on the first floor have access from the courtyard and from the plaza. The shops have glass walls on both the courtyard and plaza sides with different glass conditions. The courtyard side deals with outside space and the plaza side with inside space. The glass walls of the shop address the transparency from the streets on south and west side to the courtyard. A person sitting in the plaza is able to get a glimpse of the courtyard.





shops inside view

glass wall transparency



interior plaza



The interior plaza offers the necessary public indoor space for the building. The scale of the columns and beams denotes the affiliation of the space to the inside shops, offices and/or to the streets outside. The glass and steel facade gives the necessary transparency to make the relationship of columns and beams to the cars and trucks on the street. The plaza not only provides a pleasant indoor public place, but also serves as a buffer between the shops, offices and the streets to decrease the noise from the streets and interstate highway and the glare from sunlight.



shops access through interior plaza

east plaza facade view

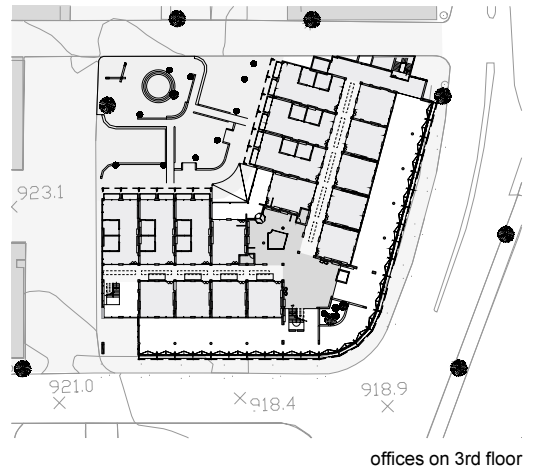
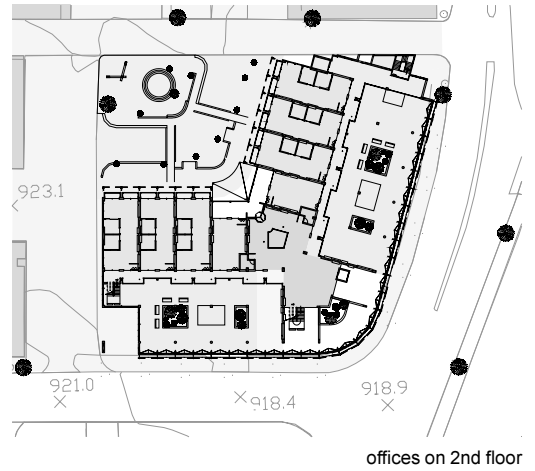


offices

The offices on the second floor are accessed from the corridor balcony in the plaza, and the offices on the third floor are accessed through central corridor.

The corridor on the 2nd floor makes the visual connection between the offices and the plaza. Alternating steel and concrete columns scale down to make the layer and relationship to human scale. Structural beams make the indirect division of balcony space for the offices.

3rd floor corridor openings make the way for air circulation through the plaza to the roof. Natural light infiltrates through the skylight openings in the roof and enters through these openings into the corridors on the 2nd and 3rd floors.



3rd floor corridor (office access)



2nd floor corridor (office access)





offices on 2nd floor

offices on 3rd floor



spaces

The offices on the courtyard side also open to the outside courtyard through a small balcony provided. The balcony addresses the relationship of the offices to the outside courtyard and the inside of the office. The shades on the courtyard side of the building balance the force of the steel facade structure on the plaza side and provide partial privacy and transparency for the offices. It also creates a different lighting condition in and out of the office unit.

plaza view from the second floor balcony



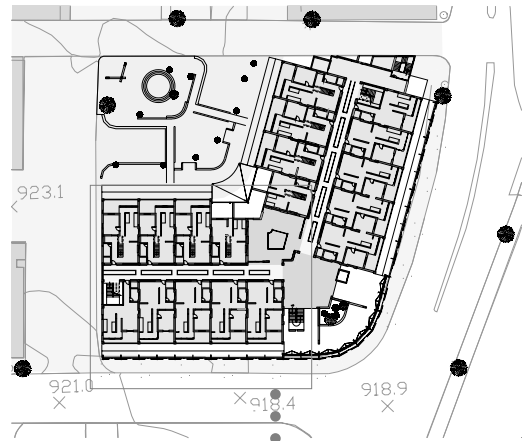


balcony view on the courtyard side (2nd and 3rd floor)

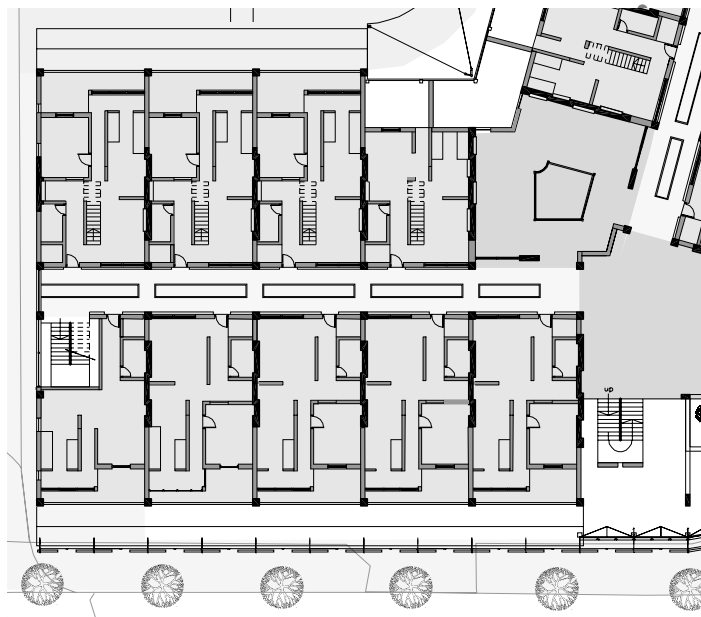
central lobby area and skylight view (2nd and 3rd floor)



apartments



Apartments are located on the fourth floor and the access is given through closed central corridors in both wings. The skylight opening through the roof makes the way for natural light to penetrate through the corridor then to the apartment's interior. Apartments on the courtyard side are two story living units with two bedrooms, study, and balconies on both floors. The apartments on the south and east sides are one story apartments with one bedroom on the 4th floor and studio apartments on the fifth floor.



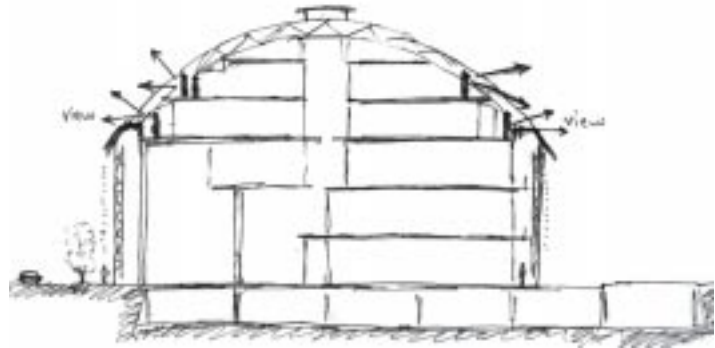


apartment interior

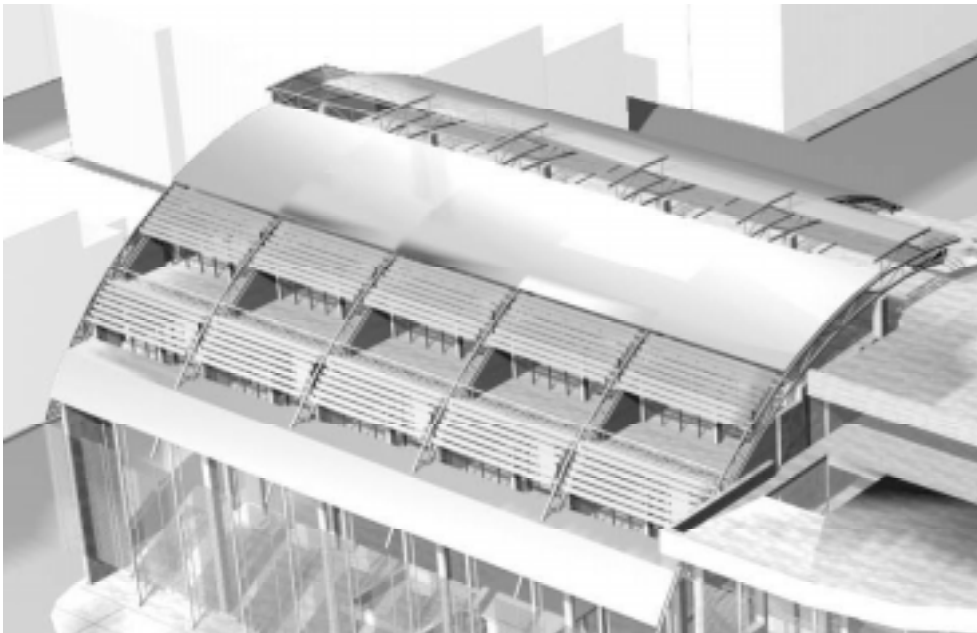
central corridor (apartments access)

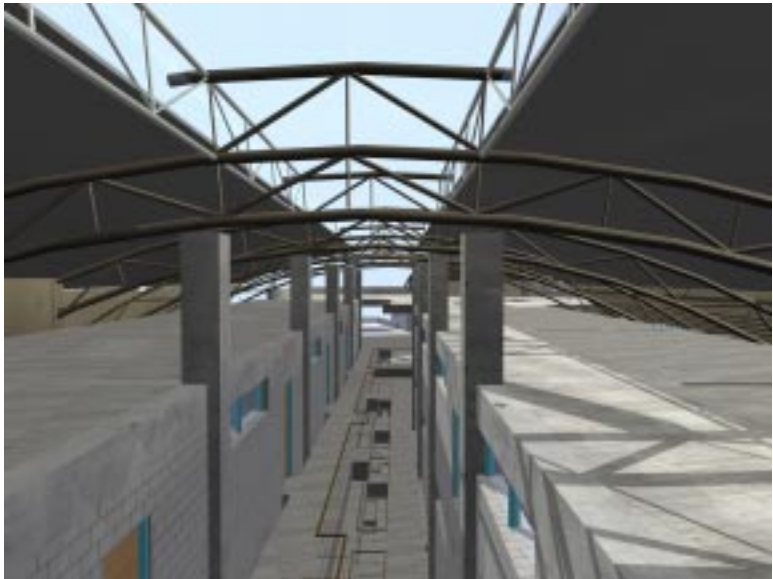


roof



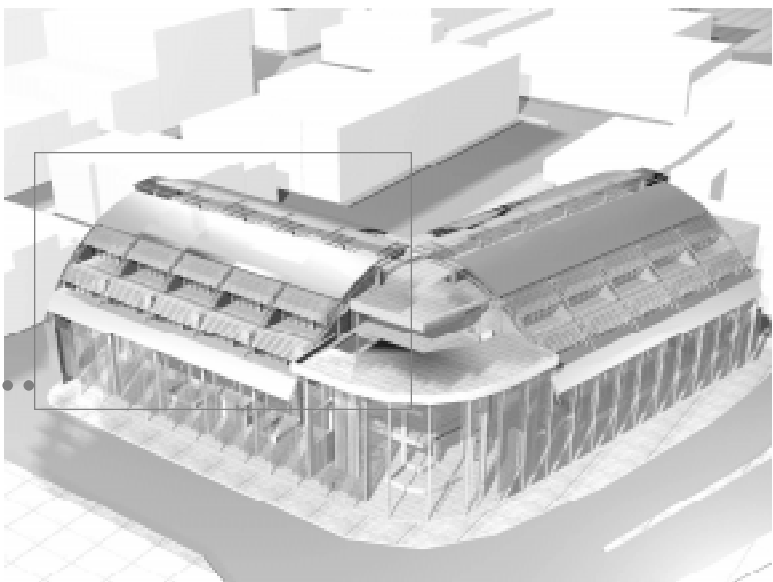
The curved roof makes the form separation of the private space (apartments) and the public space (shops and offices). Steel trusses circumscribe the shape of the roof making space for the people to stand in the apartment balcony. The central lobby area is covered by a flat roof, designating the difference in the spaces and functions. On the courtyard side, where the two curved roofs meet, the roof trusses are cut down to make the space between them. The two forces of the curved roof are kept separate from colliding with each other.



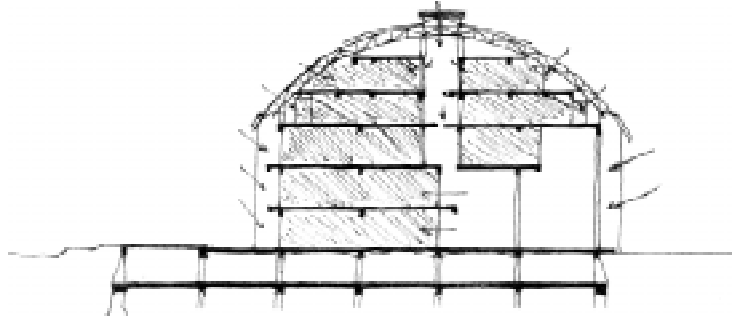


space between the curved roof and the flat roof of the apartments: enclosing of apartments, visual connection through corridor and light penetration

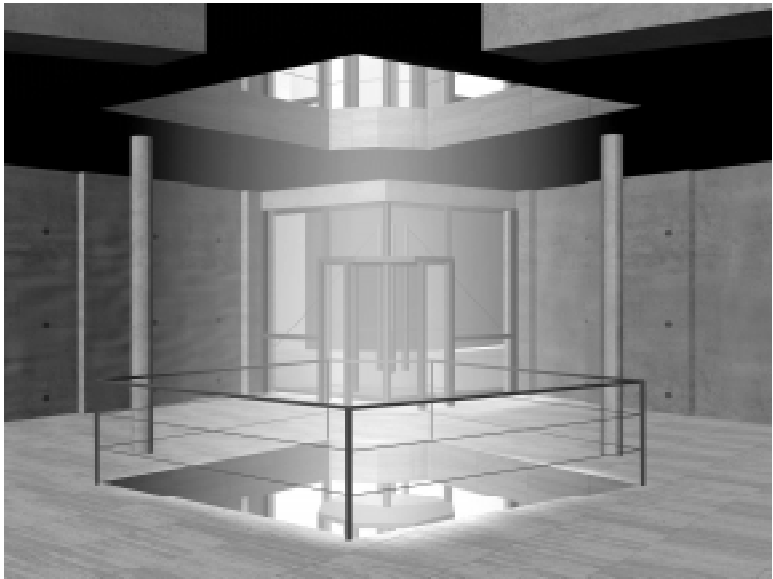
bird's eye view through southeast corner



light and space

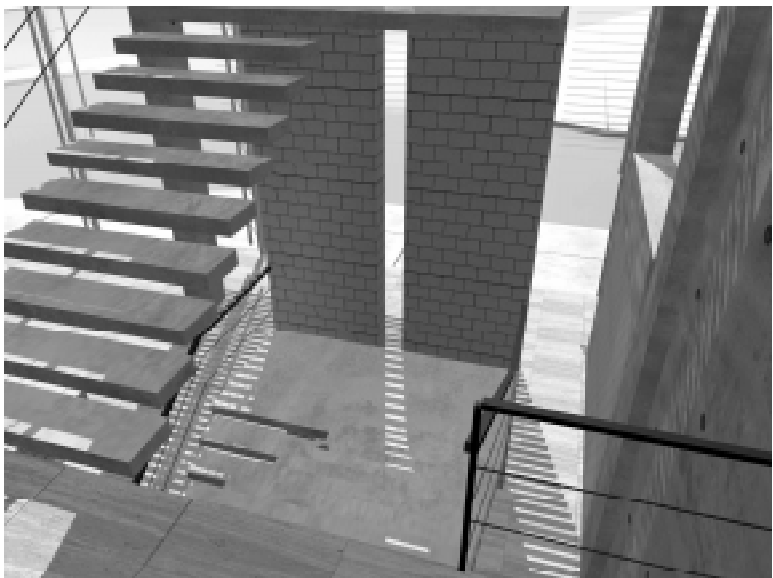


Natural lighting was one of the main concerns in this project. Glass facades provide ample amount of daylight for the plaza space and the interior spaces from south and east side. Sunlight coming through the facade gives opportunity to make a winter garden in the plaza. On the courtyard sides (i.e. the north and the west sides) the glass walls enclosing interior spaces provide a subtle condition of lighting as it scatters the direct light coming through the glass facade. The sunshades supported by steel truss columns create an interesting lighting patterns as the sun moves from the east to west.



light coming through the skylight in the central lobby

light strip penetrating through the vertical opening of the walls supporting stair



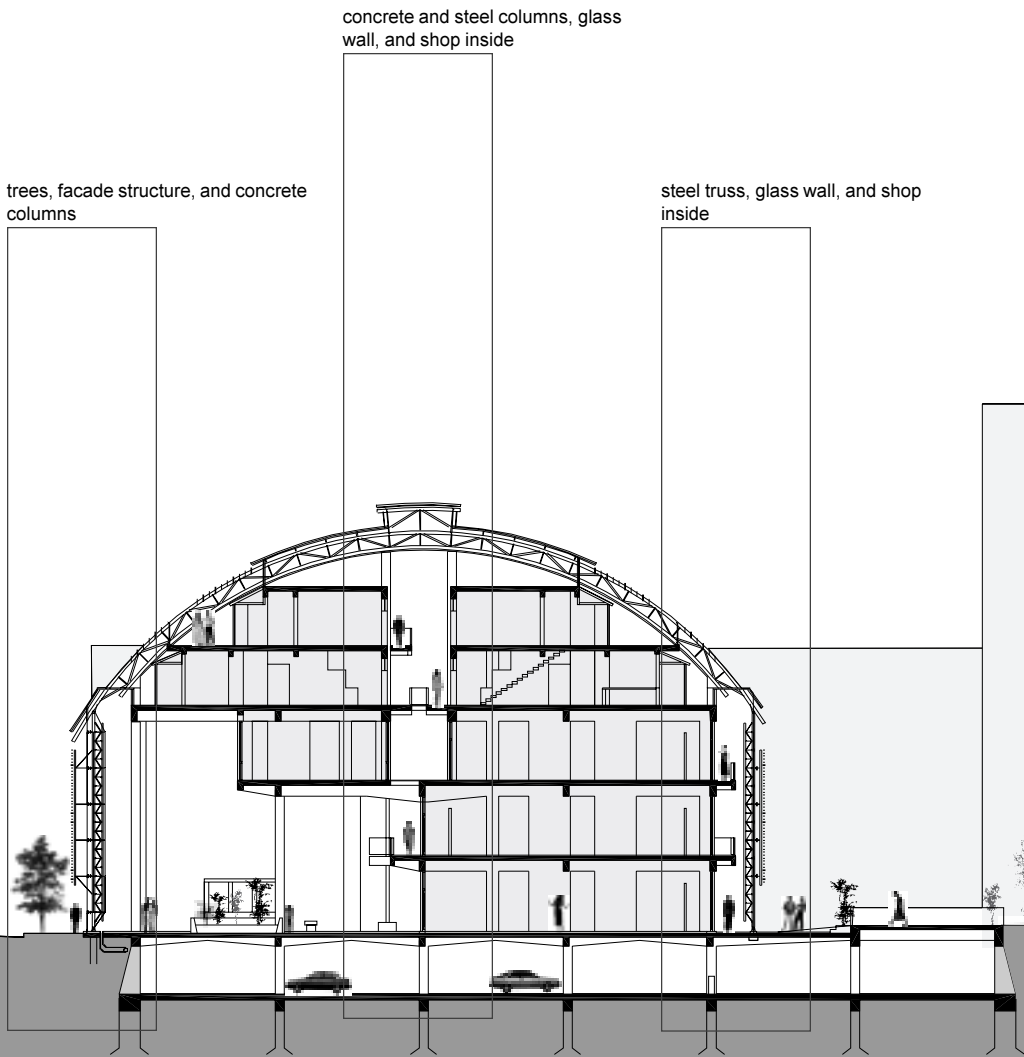
layers



The city downtown provides different conditions of sidewalks. The trees, light poles, and shop facades make layers and address the scale and relationship of pedestrians to the buildings. The sidewalks covered fully or partly show the transition from outside to inside of the buildings.

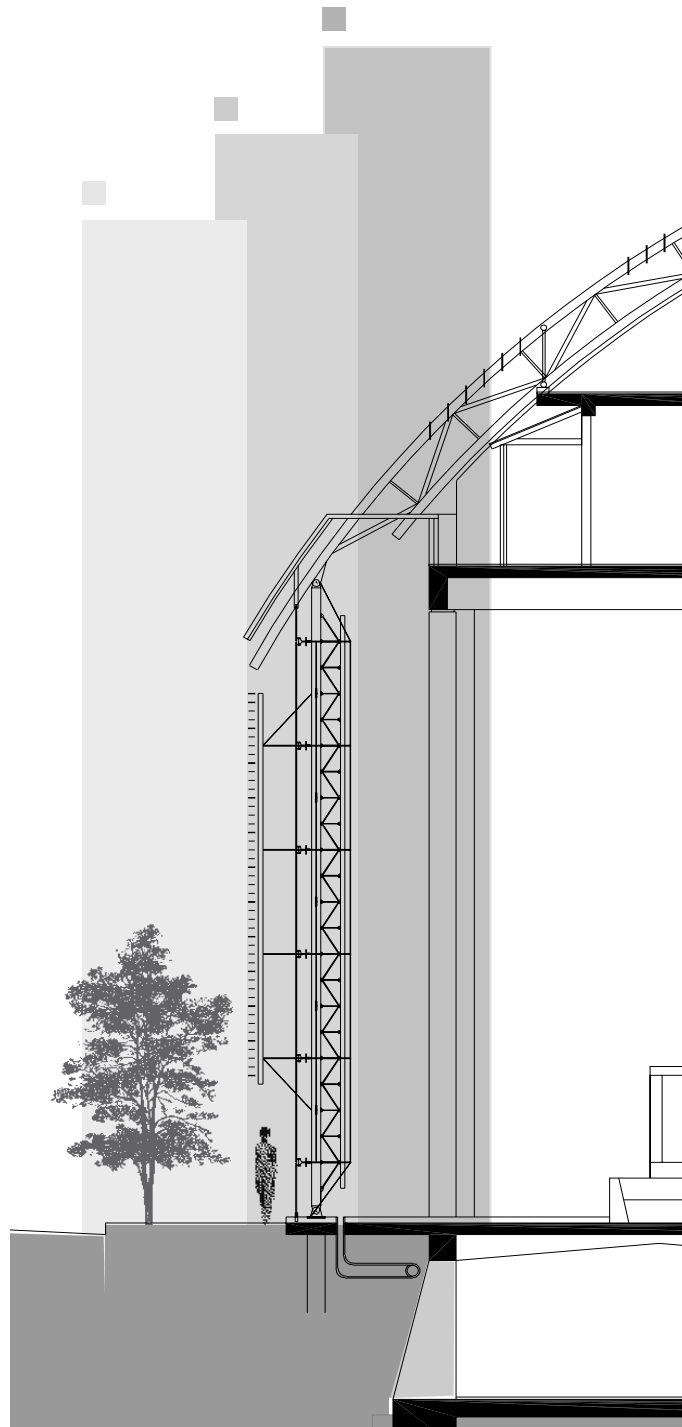
Layers are developed at various points in my project. Passing from main roads to the courtyard there are different layers of the building which express different conditions. Layers can be divided into three parts: the facade layers, the shop access in the plaza, and the facade on courtyard side.





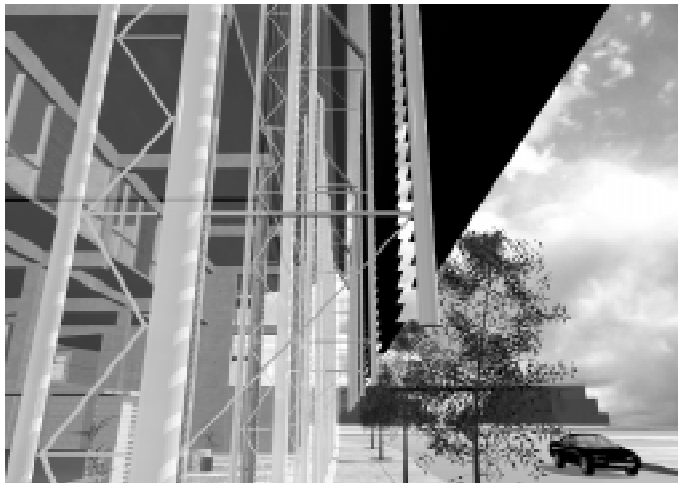
main facade

The main facade has three layers: 1st is the series of trees, 2nd the facade steel structure, and 3rd the tall concrete columns in the plaza going from first floor level to third floor ceiling. When a person walks between these layers, he will experience different conditions. The trees provide shelter from the sun as well as prevent the sidewalks from being exposed directly to the roads. The facade structure, which partly covers the sidewalk, is a complex mesh of steel tubes and cables. It can be seen while walking on the sidewalk under the structure. And finally the concrete columns make room in the plaza for people to stand against the columns and at the same time address the relationship to the vehicles on the street.

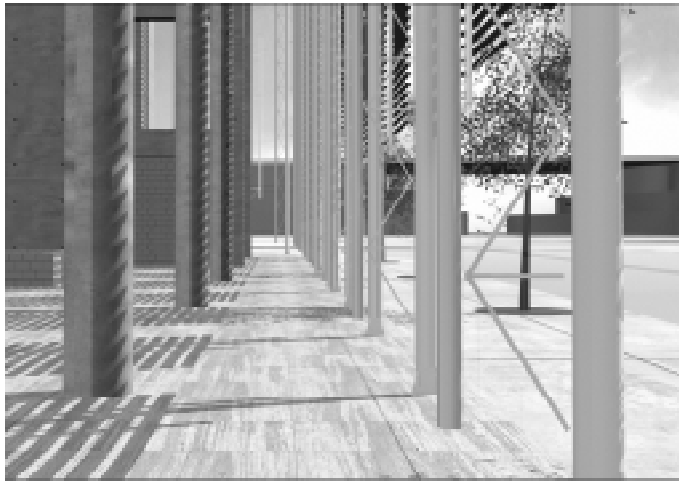




trees and glass facade structure



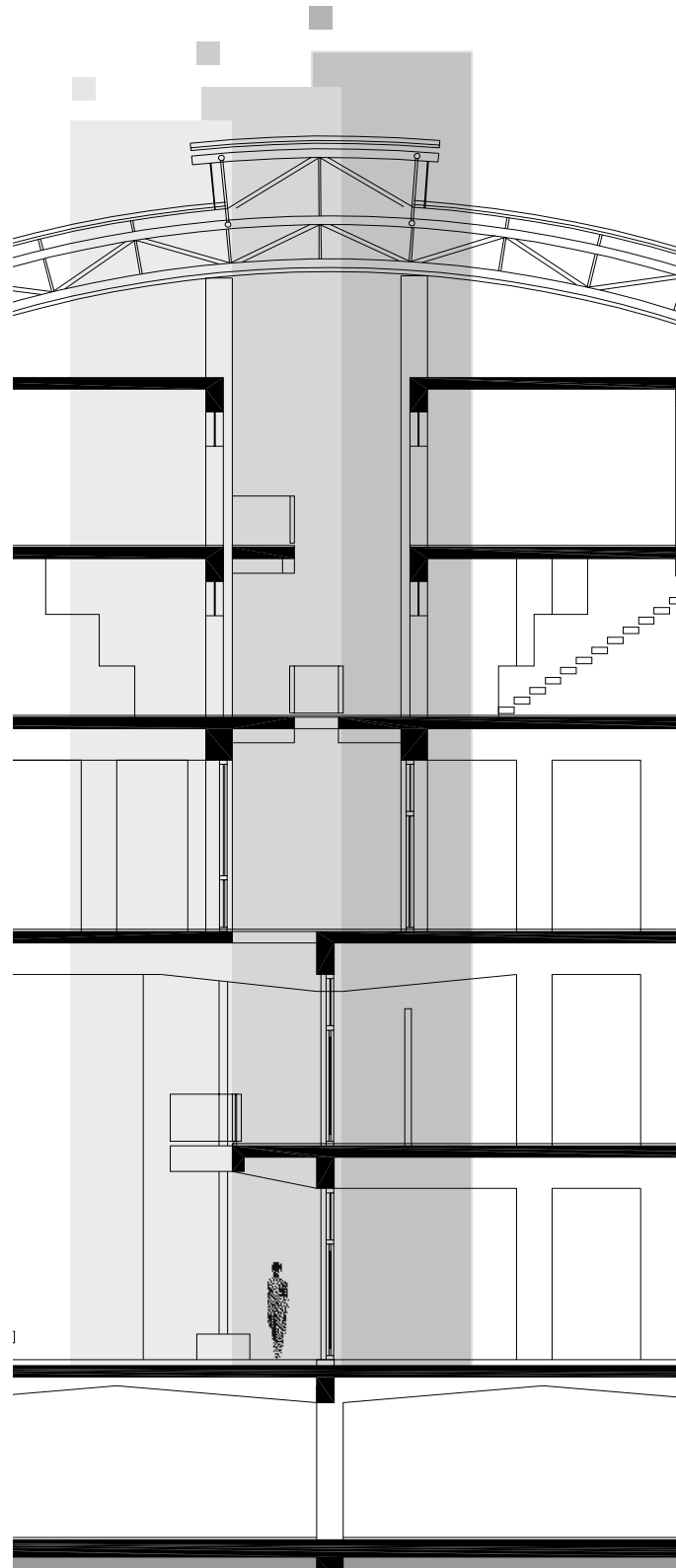
facade shades and glass panels



glass facade and concrete columns
(inside interior plaza)

shop front

Alternating steel and concrete columns in front of the shops and their dimensions relate to human scale. These columns separate the shop access corridor from the rest of the plaza. This corridor space provides the transition from plaza to inside of the shop. The glass wall closing the shop gives the transparency for people in the plaza.



interior plaza and alternating concrete and steel columns



alternating steel and concrete columns and shop glass wall

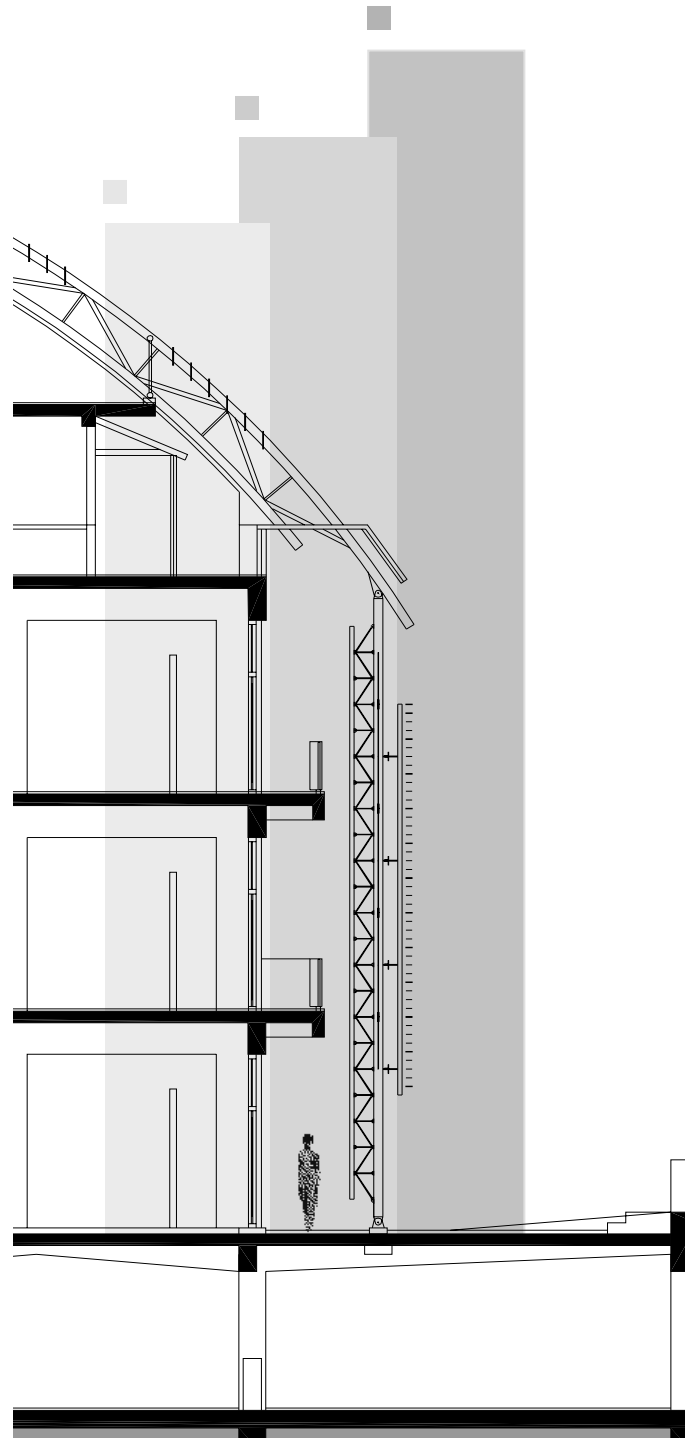


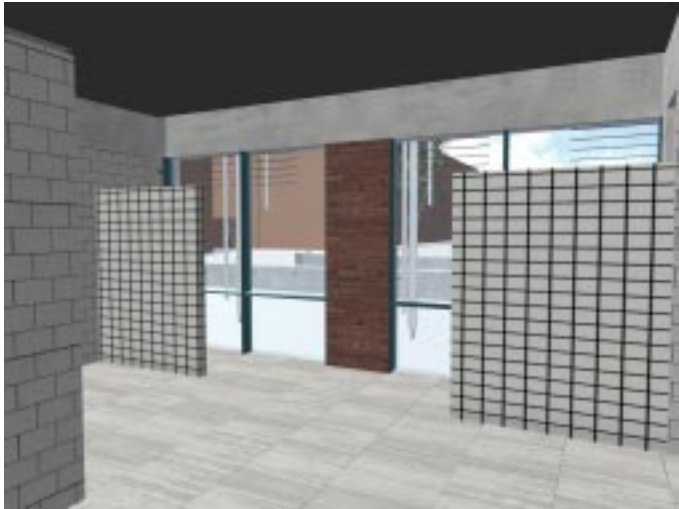
shop glass wall and shop inside



rear facade

On the courtyard side the facade responds to a different condition, since there is no glass to be supported on this side. It supports the shades which unify the facades on both sides of the building as well as partly screens the balconies on the 2nd and 3rd floor.





shop inside and glass wall enclosing the shop

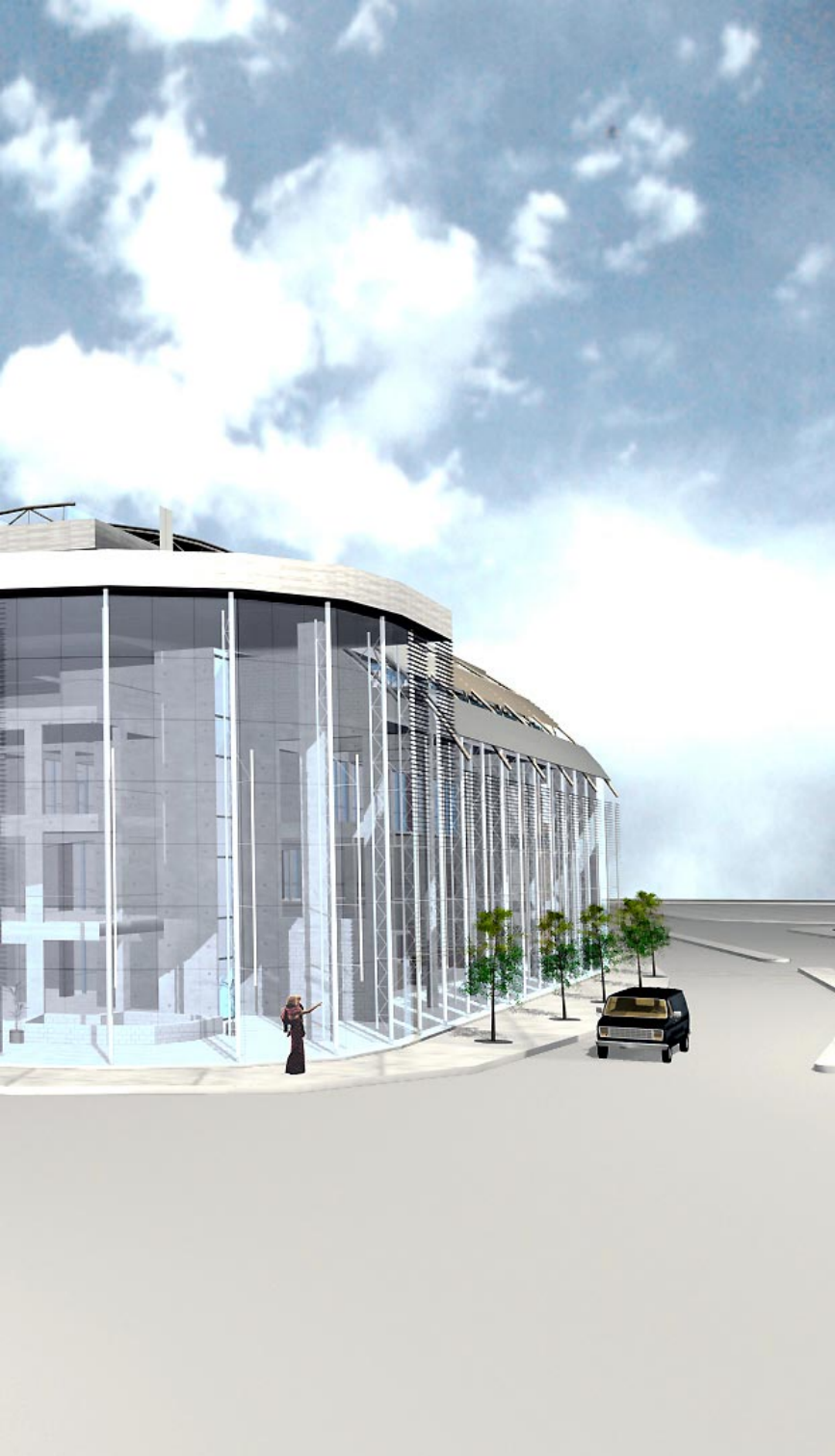


glass wall enclosing the shop and steel columns and shades



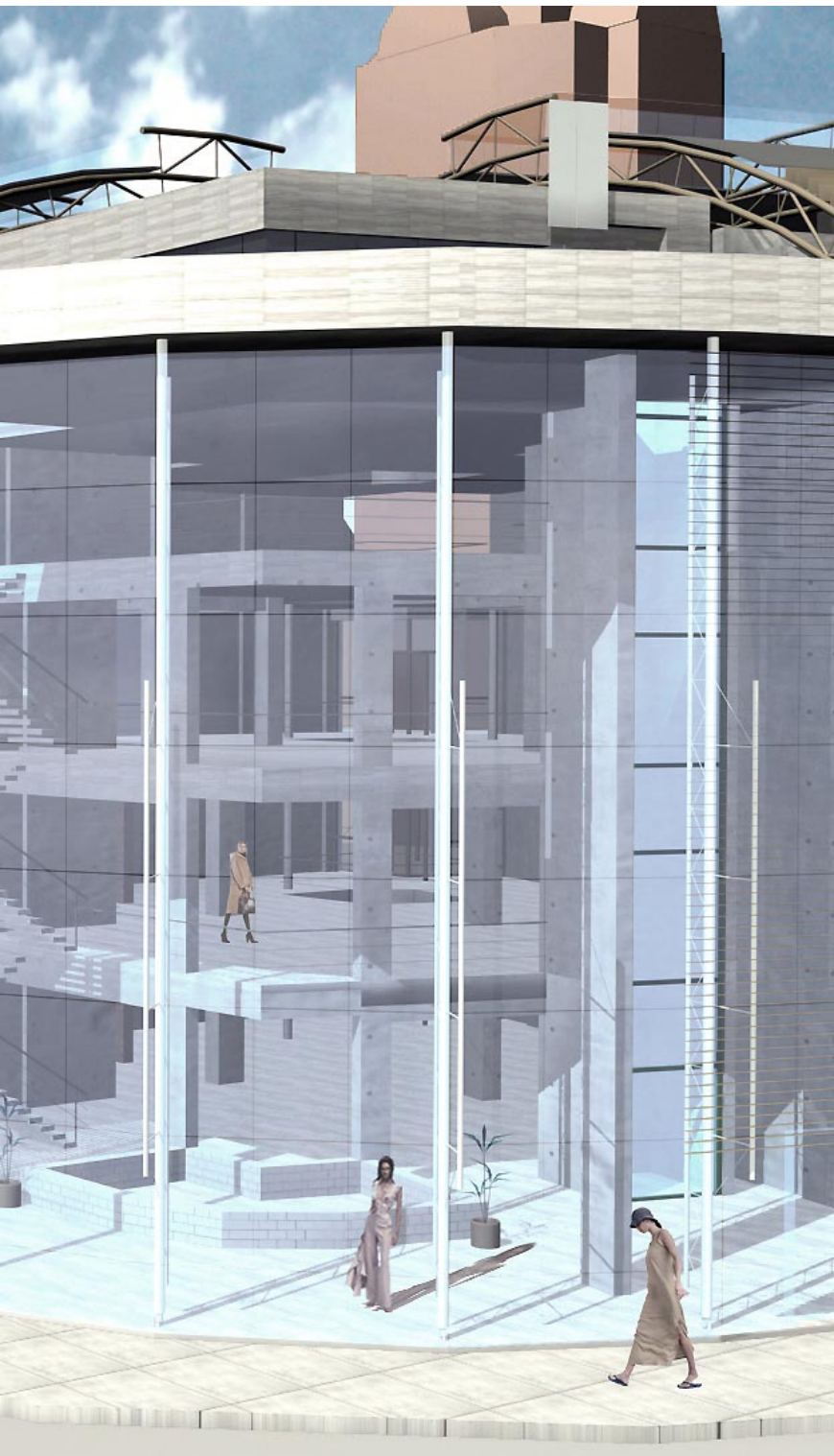
steel columns and shades and courtyard





view from Williamson road:
glass facade, transparency, and vertical space





view of the facade along Church avenue:
layering pattern, curved roof enclosing the apart-
ments, and corner transeparency

view of the main lobby:
structure, main stair, skylight, floor levels, and vertical space



view of the main lobby:
structure, elevator, floor levels, and vertical space







view of the courtyard from an access road:
outdoor public space, main entrance, and tran-
sition from downtown to inside of the building





view of the east side interior plaza:
glass facade, structure elements, scale of the
elements, and indoor public space

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1963

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Querini Stampalia, Carlo Scarpa, by Richard Murphy, 1993

Renzo Piano Building Workshop: Complete Works, by Peter
Bachanan, 1999

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softwares used:

images and layout-

- adobe photoshop
- adobe pagemaker
- adobe illustrator

drawings and 3d modeling-

- autocad

3d rendered images

- 3dstudio max

