

**Habitable Walls**  
Courtyard homes in Urban Places



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*Courtyard homes in Urban Places*

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by  
*Jorge del Castillo*

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*Approved:*

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*William Brown - Chairman*

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*William Galloway*

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*Michael O'Brien*

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*Heinrich Schnoedt*





### *Abstract*

In the United States, the living urban environment in the last two centuries has almost completely disappeared. Dense urban environments as viable and normal places to live have become a thing of the past. Living in the suburbs has become the trend and everyone has looked to the outskirts of the city to live. Downtown areas have become a place to work, and the suburbs a place to live. Downtowns have become ghost towns during the evenings, while little communal interaction can be found in the suburbs due to its inhuman scale and automobile dependence. Developers have marketed suburban living for their profits, offering no other alternative housing between suburban and urban living cores as they exist today. This thesis will explore an alternative prototypical housing type to promote vitality and livability in urban environments today.





Table of Contents

Abstract	ii
Table of Contents	iii
Introduction	iv
Past success of the courtyard home	1
Disappearance of the urban core	5
Urban vs. Suburban	11
Project development	17
Project	21
Notes/Credits	33
Bibliography	34
Vita	35

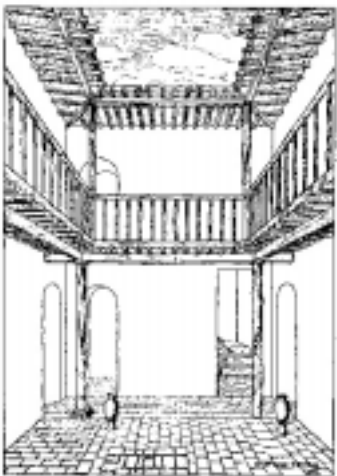
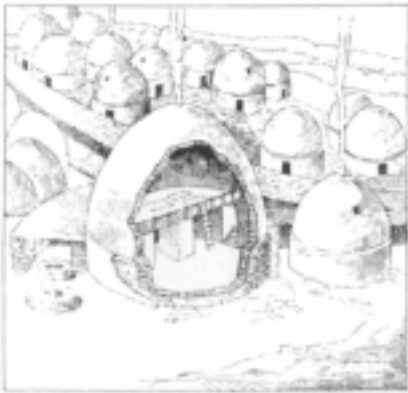
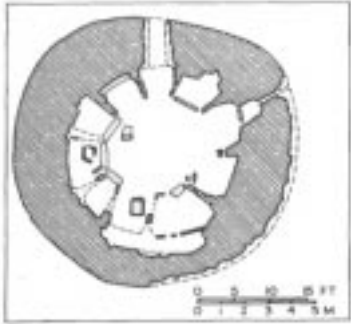




## Introduction

The decline of the urban dwelling has been brought about in the last 150 years due to many factors. Moral, economic and social factors have contributed to the demise of the urban fabric. Even though the industrial revolution contributed to much prosperity to many growing cities, it also came with a price: the burdens of growth and its associated problems. It was these setbacks during the booming growth of industrial cities that spawned the development of suburban communities. The development of the railroad and steam car, and later the automobile, was probably the most important factor that contributed to the success of the suburban community. The size and density of early cities were constrained by the limitations of pedestrian and early mass transit systems. Only the most successful citizens could afford a horse and carriage and live outside the city in their countryside villas. With the development of new affordable transportation to all, it was now possible for seemingly middle class citizens to live the life in the country like the gentry of their time with their Palladian villas in the countryside. Peter Eisenman once stated that *'the suburbs was a simulation of a country house.'*

The early beginnings of the suburban home were beneficial in many ways and solved many of the problems that existed during its inception, particularly the resolution of congested overcrowded city conditions that were unsanitary and unhealthy for many residents. Prior to the automobile, cities were small, compact, with dense living cores and well defined centres. The automobile spawned new fragmented American cities that were satellites of the older inner city. The suburban community saw many changes in this country at the hands of developers during the huge housing boom of the fifties and sixties. Along with the boom of suburban residential neighborhoods, developers were also building office parks, mega shopping centers, strip malls and theaters. The suburbs no longer had to rely on the inner city for economic or social support. Consequently, the living urban core has been at an all-time low due to the popularity of suburban living. The traditional city with its well defined middle has been replaced with the new super suburbs with a metropolitan sprawl that has claimed land area ten times larger than its original predecessor.



1 Different generations of centralized living spaces demonstrating the evolution of courtyard homes used today: Neolithic drystone houses having alcoved sleeping spaces around a central communal space, **Top figure.** Neolithic house in Cyprus showing a smokehole positioned over the central hearth, **Middle.** Square configured courtyard home located in Ur, Iraq, second millennium B.C., **Bottom.**

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## Habitable Walls

### *Courtyard homes in Urban Places*

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The past success of the Courtyard home

*From the song of Shi-King, 825 BC*

*Evenly stretches the courtyard wide,  
High stand the pillars on each side  
Softly therein the sunbeams glide  
where the quiet rooms inside  
Lie in peace, their great Lord's pride*



- 2 Dense courtyard homes in the middle east. Having a space to call your own, that provided privacy and a space underneath the open sky made urban living a different realm than what is known today.

Courtyard houses have been the central design idea in nearly all great cultures. They were extensively used in the ancient civilizations of the middle east and central Asia. They were employed with great success in Egyptian, Persian, Roman and Chinese civilizations for thousands of years. The evolution of the courtyard can be traced back to man's cave dwelling years. There are many similar symbols and elements found in the cave that can be found in many early courtyard homes. Most cave dwellings were organized around a central space, which usually contained a fire. This open space was the scene of many of early mans' activities. Early man used to cook, congregate and even sleep around this central space. Similarly, many early courtyard homes were organized around this central space. Many early courtyard homes used the central space to house and keep a fire burning, as well as sleeping quarters. Courtyards in the middle east today contain sleeping spaces found around the courtyard space in covered alcoves set back against the wall.

The word '*atrium*' originally meant "black" (focus), because it was at this location, at the center of the house, where the hearth of a fire was located, and the ceiling of the roof was blackened by the rising smoke. Through generations of development, openings were placed over the hearth, to accommodate escaping smoke and fumes, until gradually the roof completely disappeared and the hearth was later relocated to another part of the house, the kitchen.

The earliest courtyards date back to 3000 BC, and were found in China and India. Early courtyard homes were also used in the west during the Egyptian and Roman periods. China has made the most use of the courtyard



**3** Economic, social and regional adaptability of courtyard homes as seen in the past: Rural use in a country courtyard home in Salta, Argentina, **Top Figure**. Aristocratic use of courtyard home at the Alhambra in Granada, Spain, **Middle**. Dense Urban courtyard homes in Beijing, China, **Bottom**.



**4** Courtyard homes in Athens, 450 B.C.

house, which can be seen today in abundance.

The development of the courtyard home can be examined and supported by any number of reasons, both physical and spiritual. But most of these reasons can be classified as secondary reasons, whereas the enclosure of personal space in a dense living environment must be maintained as the primary objective of the courtyard house. Spatial relationships between man and an outside space which the inhabitants can claim as their own is probably the single most important factor in the psychological success of the courtyard home. It is a space where man traditionally has been able to escape, to seek peace, solace and isolation, while at the same time retaining the comforts of nature: the sun, the moon, the rustling of the wind and the singing of birds. When the inhabitant needed to seek shelter from the hostilities nature had to offer, enclosure was just a few steps away. This double faceted phenomenon is what has made the courtyard home so favorable in the past with so many cultures, except in the United States. This wide use has not only been seen in dense urban environments, where its use is probably best rendered, but it was also widely used in Rural and aristocratic uses of the time. It is the only prototypical residential home where you get a private space beneath the open sky, qualities not offered by the enclosed suburban box.

Land use is probably the most important physical reason for the development of the courtyard house. Historically, courtyard homes existed in greater numbers in the past because of the restricted use of land. Cities were crowded and the density was much higher since people needed to be in close proximity to the commerce the city had to offer. Mobility was a problem, and typically people did not live more than half a day's walk from the city's edge. This constricted use of space in a sprawling city is what made the courtyard home an attractive proposal for residents wanting a personal space which was also open to the sky. More often than not these spaces were meticulously maintained since it was an extension of their own personal space and was viewed as the center of the house.



5 Modern usage of the courtyard home: The German Pavilion at the Barcelona world exhibition by Mies van der Rohe, 1929, **Top** **Figure.** Row House, Sumiyoshi, Osaka by Tadao Ando, 1975, **Bottom.**



**6** Booming times: Traffic and congestion at Dearborn and Randolph streets in Chicago, 1909.



**7** Urban living conditions made unbearable due to the lack of a private inward personal spaces on the upper west side of Chicago during the early 1900's.



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### *Courtyard homes in Urban Places*

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The disappearance of the Urban living core

There were several distinct factors for the decline of the urban living core and the emergence of the suburb. Industrialism contributed to most of these factors and covered a broad range of constituents. In one sense, the early progress and explosion of growth the industrial period brought was unmanageable to society in general. Thousands of people were now looking for work in the city, and housing requirements were not immediately available. Cities grew too fast to accommodate the influx of newly relocated people and immigrants now looking for work. In one sense, the growth was too much too fast. Soon, there were overcrowded and unsanitary conditions throughout most major industrial cities. In Manchester England, the life expectancy of a tradesman was far less than a worker working elsewhere in the country, by as much as fifty percent.

Fortunately, the industrial period also brought many new advances, particularly in the development of the railroad and street car. It was these advances that in turn allowed workers the new-found freedom of commuting beyond the outskirts of the city. In an odd sense, the industrial revolution was the reason people came to the city, and it was the very same reason people wanted to leave. Ironically, it was the industrial revolution that provided this means of escape for the average middle class citizen. Now it was possible for middle class citizens to live outside the city, much like the well-to-do gentry of their time. Early suburbs were fashionable because of their associations with life in the country, thus paving the way for the romantic imagery the suburbs would have for a very long time, an image that is known to many people, with its rose gardens and white picket fences.

The other major reason for the decay of the urban living core had to do with the moral decline in the city. Many people in influential positions thought that the moral problems in the city were damaging to family and spiritual life. They advocated that the problems with morality could be overcome by raising children in pleasant nurturing homes in the suburbs. The inner city was now viewed as an evil mankind had created, and the suburbs were responsible for overcoming this evil.

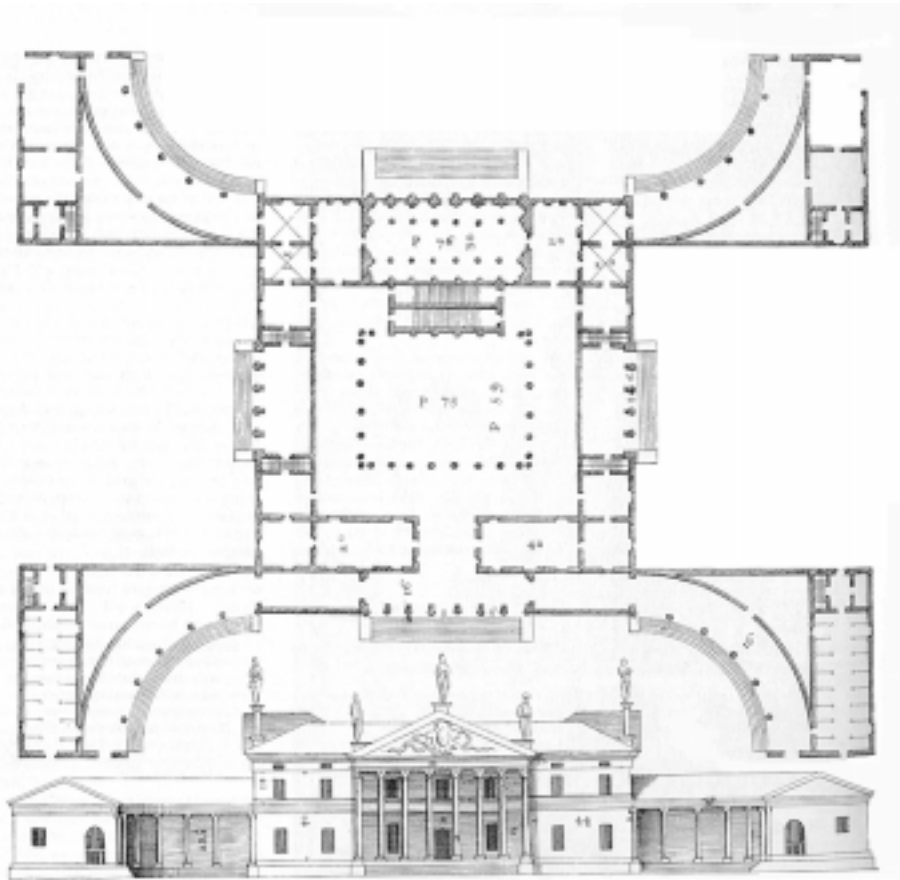


**8** Back yards of Urban housing units in Manchester, England during the latter stages of the industrial revolution



- 9 Picturesque Imagery of suburban living: Commercial posters depicting the easy life in London's suburban neighborhoods, **above**. Suburban homes emulating country villas on their own tract of land in London around 1850's, **Top right and bottom**.



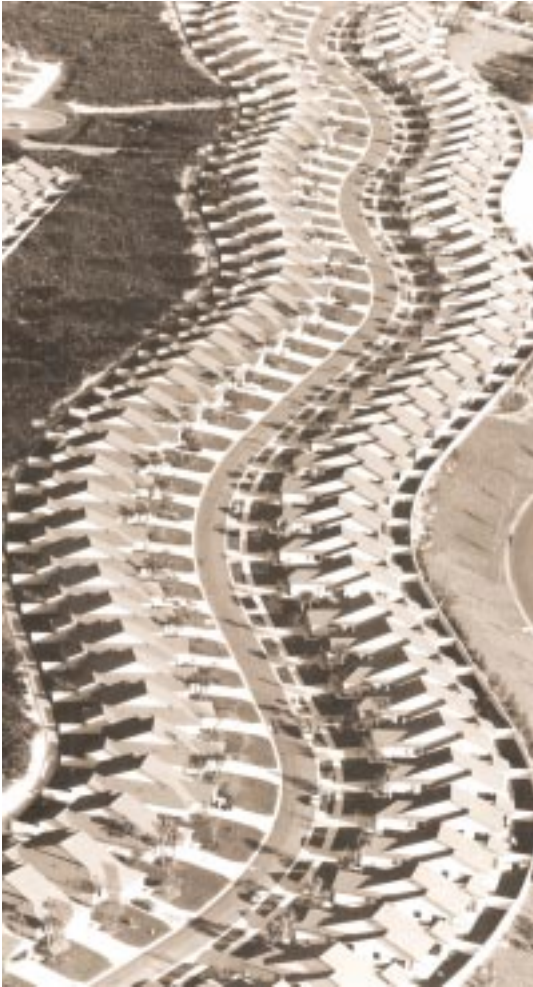


10 Andrea Palladio, design for a villa from the *Four books of Architecture*, 1738. An image of success that many aspired to: 'To reside in a home on your own, on a plot of land in the country.'

Unfortunately, not everyone was able to afford to leave the decaying inner city for a more affluent home in the suburbs. Middle class inhabitants were making the transition, but lower middle class and lower income groups of people had to stay in the more rundown neighborhoods of the inner cities, a trend that is still seen today. Today's inclination in most major U.S. cities is that most people do not reside in downtown areas. Of course there are always some exceptions to this rule as seen in the costly areas of San Francisco, Chicago, and Manhattan. The general trend is that the more you move away from the inner city, the lower the population per unit density; a factor which is attributed to more open land and single family homes in the suburbs, as opposed to the dense urban living core. Consequently, the more you move from the inner city, the higher the household income and social status per home. All these trends were put into motion with the attitudes that were developed during the industrial revolution and the birth of the suburbs.

Ironically, architects of the day were not willing to jeopardize their careers by designing low cost social housing, thus alleviating the social problems that existed between the early suburbs and urban environments. The profession of architecture was an exclusive service, reserved only for the privileged few, who usually lived in high end suburban homes and rural neighborhoods. Only in the last seventy years has the profession of architecture realized the social importance and responsibilities towards the lower income housing market, which is normally controlled by federal governmental agencies.

To a certain extent, the fascination with the detached single family house is based on past traditions that every man should own his own home on his patch of land, a position held during the birth of this country. Most people at the inception of this country were farmers and worked on agricultural farms; 95% of Americans lived in rural areas. As such, it was understandable why most homes built in the suburbs during the latter part of the nineteenth century resembled farmhouses or ranch homes, prototypical homes that were designed to sit on a large plot of land with nothing surrounding it but open land. This trend continued up to the World War Two, when building efforts diminished and all available resources were maximized to



**11** Today's suburban development, trying to add flavor to an old idea: but the root of the problem is the idea itself. Suburban development in South Florida, **Above**.



**12** Early birth of a suburban community using the farmhouse as a prototypical unit for the suburbs, Grand Island, Nebraska, 1885, **Above**.

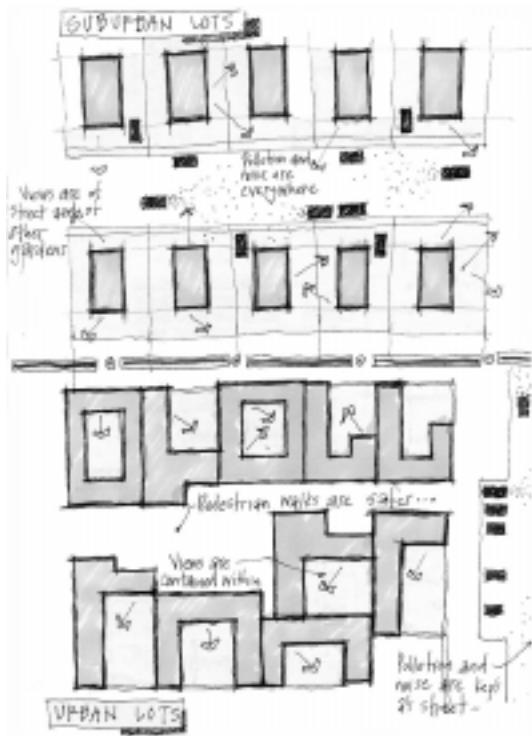
help the wartime efforts in Europe and the Pacific.

When building resumed again after the war, the economy was in excellent shape from the wartime efforts, and there was a major housing boom during the early parts of the 1950's. It was this boom that saw the biggest developments of the suburbs. There was no reason not to continue the traditions of building single family detached homes as had been started in the early 1900's on through the 1920's. These communities seemed to be nice places to live, and people were still demanded them. Most people still wanted to "own their own 1/4-acre estate."

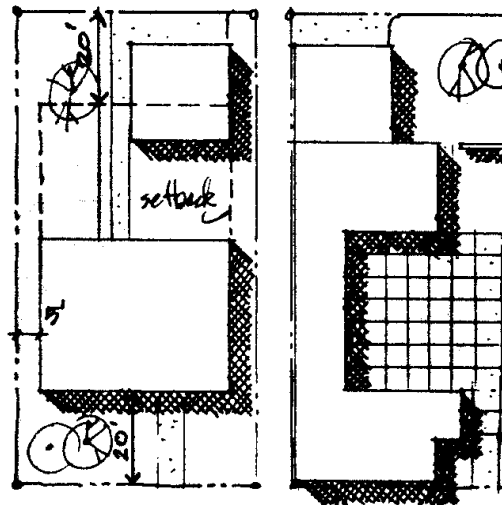
Soon developers realized the problems associated with building large suburban neighborhoods, and tried to manage the best they could. To keep costs down, most houses were built on relatively flat land; if the flat land was not available, it was provided for by severe grading and digging. Sidewalks, sanitary lines and water lines also contributed to the massive digging and grading. In the end, there was little to see in the way of natural vegetation that once occupied the land. Other cost control contributors involved standardized lot sizes, minimizing costly road frontage for each home, hence making narrower, deeper lots. Uniform placement of homes curtailed costs, and setback requirements came into place. Straight streets provided the developer the means of providing the maximum number of homes on an available block, thus increasing his profits. All these factors helped the developer provide homes at a reasonable construction cost while maximizing the profit for his pockets. The finished product lacked variety and had little to be desired, but people still bought them since there were no other alternatives. Life in the urban core wasn't even a consideration. These adapted farmhouses were built within ten to fifteen feet of each other, affording views into your neighbor's bedroom window and garages across the street. The most serious reprehensible use of the suburbs has been the attack on the open land. Low density units have used up land rapidly, thus inflating the prices of undeveloped land. New developments are chosen further from the current sprawl on cheaper land in order to diminish development costs, thus providing a larger suburban sprawl leaving pockets of undeveloped land.



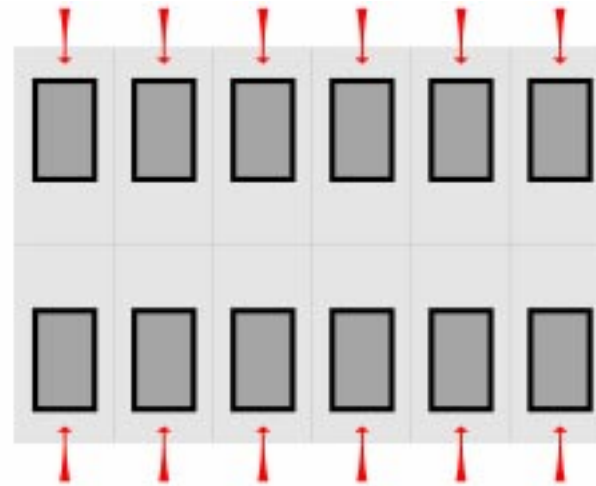
**13** Californian Tract homes under construction during the housing boom during the fifties.



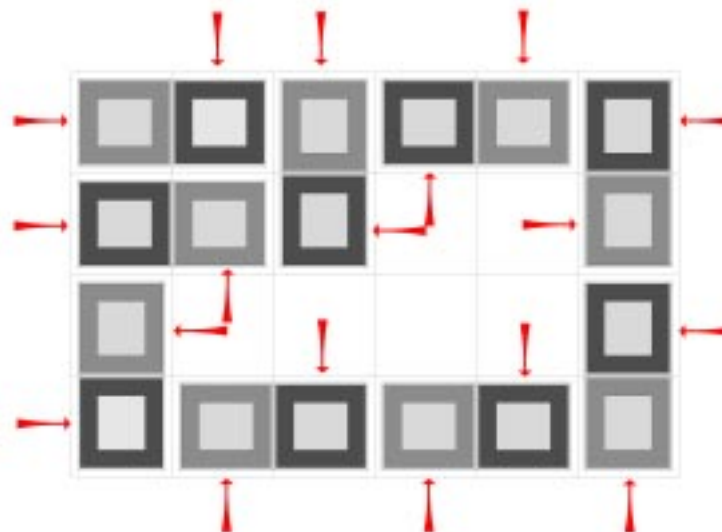
14 Study of urban vs. suburban living qualities taken from *Livable environments*, Roland Rainer, (Verlag für Architektur Artemis, Zurich, 1972)p.48.



15 Comparison of elemental differences between the typical suburban lot with setback requirements and those of a courtyard house being built to the edge of the site.



16 Typical Suburban lots of 75' x 150'. Zoning ordinances require setbacks on all four sides contributing to the forced placement of the home on the lot. Building footprints average somewhere in the vicinity of 30-35%. Pedestrian and vehicle access usually is always approached from the road frontage side.



17 Possible configuration of same sized lot, with the elimination of the setback requirements. Access is not only confined to the road frontage side, but on internal passages as well. Density is increased by 33%, as two courtyard homes are placed on one lot. Square footage of the house is only decreased by 23% on half the sized lot, while green space is decreased by 17% in relation to the lot size. One hundred percent of that being private. 4% of each lot is dedicated to communal access. Three lots are dedicated to open space for the entire block.

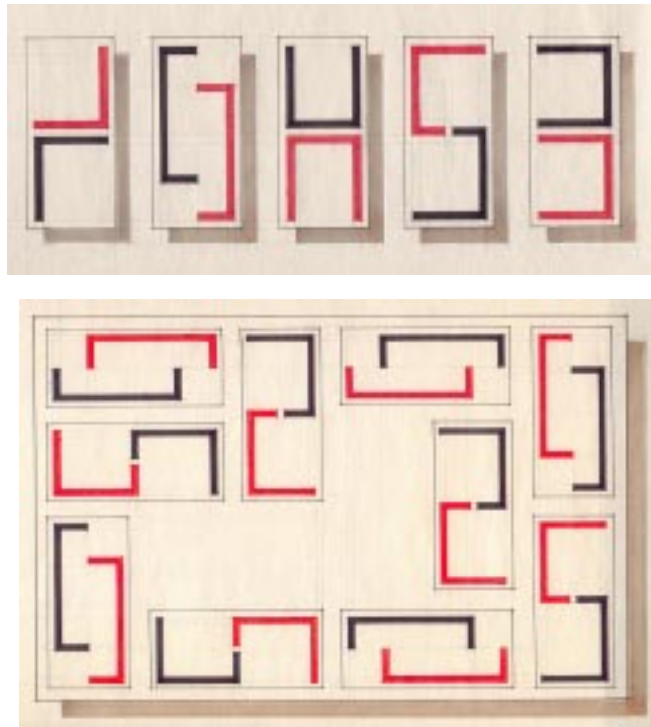
### Urban vs. Suburban

The beginnings of my thesis project, though unknown to me at the time, occurred in the second semester of my first year of graduate school. Our professor in our first year design studio asked us to design a suburban house on a typical suburban plot of land. Instead of typical requirements, a program was developed by examining preconceived notions or conventionalism. At least, we were expected to have a proposal for a “good” room. This project eventually became the catalyst to push me further to study this topic for my thesis.

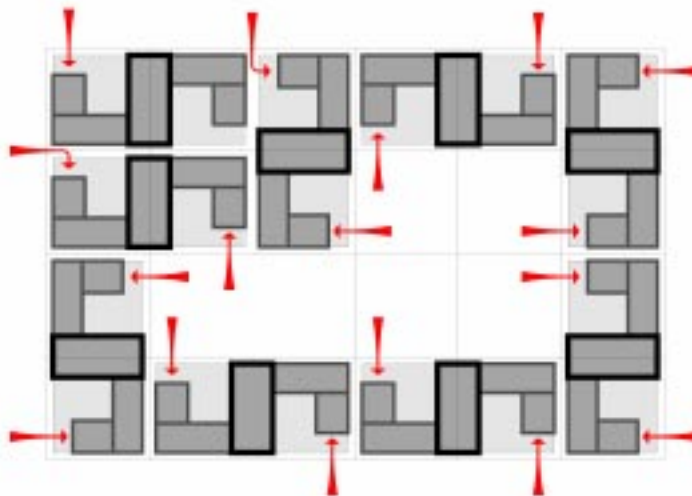
My past experience in small architectural firms in Miami taught me that the design of suburban houses usually starts at the site, more specifically with the setbacks. Setbacks and lot coverage requirements in most municipalities are so extensively laid out, that after reading a few paragraphs of their ordinances and complying with them, the building was already positioned for you where it was going to sit on the lot. Zoning ordinances had already contributed to a major aspect of the design of the home with only a couple of statements outlining setbacks. After some brief investigation, I came to the conclusion that what I really preferred were urban conditions of building to the edge of the site, using the inside as privacy and enclosure, a courtyard house typology. Suburban living remains a viable option for many people today as no alternatives in adequate urban housing is offered.

One of the main issues I wanted to address was the importance of the automobile in suburban living. The suburban neighborhood devises its scale and relationships primarily from the car instead of the pedestrian, who ultimately inhabits the environment. The scale of the street is suited towards faster moving vehicles than pedestrians, far from the picturesque ideal of white wood fences and dogs in the front yard that had been romantically associated with living in the suburbs.

Visiting Europe, I was amazed at how narrow some city streets were. Naturally, European cities had been built long before automobiles had been invented and were geared



**19** Schematic configurations of possible interlocking courtyard designs and their destinations located on the individual lots.



**20** Further development of block with u-shaped units and varied locations of garages and entrances. Garage access can be either through the courtyard or directly from the street depending on the unit location.





- 20** One of the final resolutions for the site. Even though the project was largely a prototypical scheme, a site was eventually chosen to give guidance to some design parameters. This is a typical suburban block north of downtown Miami, where the density was increased by 50% if typical suburban homes were built on existing zoning requirements. Three lots were dedicated to a green space to the block as a whole.

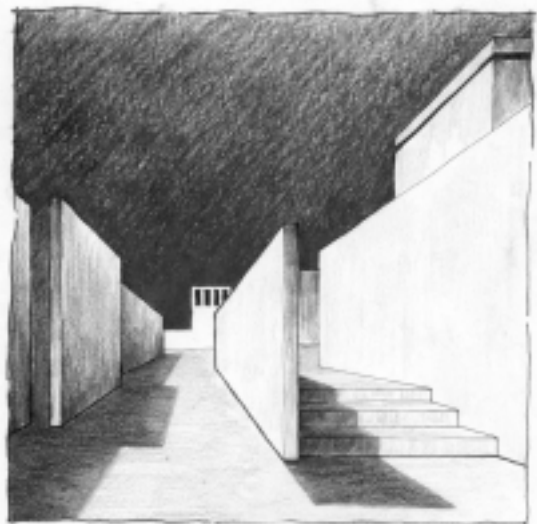
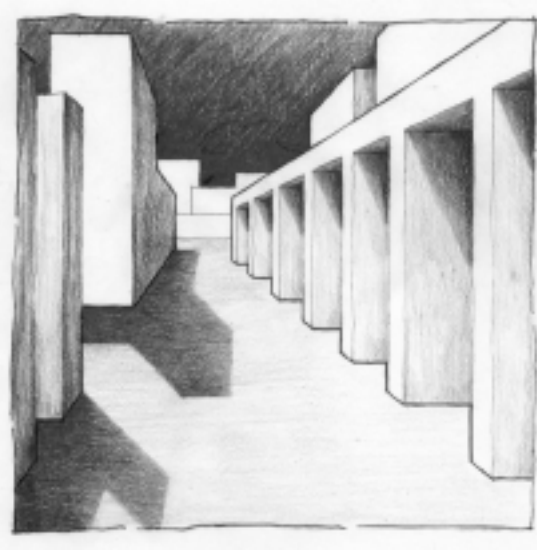


**21** Courtyard scene; Rendered perspective shows the quality of life that can be attained inside the communal courtyard. Individuals can have privacy in their own courtyard space or can interact among each other in the common green space in the center of the block.

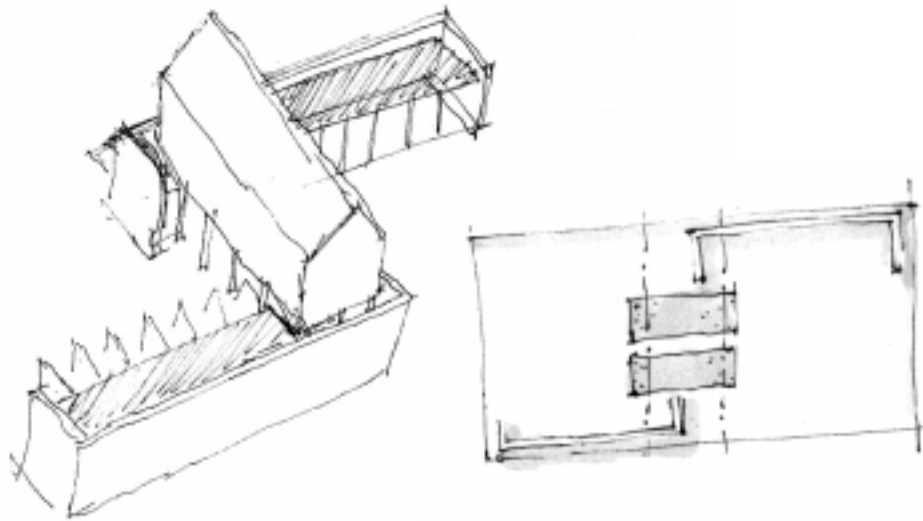
more for a pedestrian than a moving vehicle. I noticed even now with the advent of the car, the pedestrian friendly streets still belong to the people. In retrospect, I wanted to create a neighborhood where the streets belonged to the people and not the automobile. When driving down a modern suburban development in the United States, the first thing to dominate the entire scene are homes lined with massive sized garages with automobiles parked in front of them. Having driveways in front of the homes that resemble small parking lots contribute to the lack of use of the garage, and in turn the garage becomes a second means of storage for the home. If urban homes had the opportunity to park in a personal garage where they had access directly to the home, the garage would be used daily for what it was intended, and not for storage. The courtyard type and its setbacks make it quite difficult to park the car in front with no other alternative than to use the garage.

Upon starting my thesis project, I started to look back at the previous projects I had worked on in the last year while in school. I knew there was still much more to explore and investigate in the suburban project I had done the year before. I started to ponder the possibility of what it would be like to adapt the project not to one house or one site. Stemming from the previous project, the beginnings of the project weren't 'site' specific. To develop the typology of a courtyard home on grided city block I chose a site on the outskirts of downtown Miami, accepting the restrictions and parameters to guide my design. The area used to house residences, but was now being used as parking lots, storage facilities and warehouses. Since the area was as a residential neighborhood close to the downtown area during the early 1900's, the land was plotted as a suburban neighborhood. Being on the fringes of the older downtown Miami, it would have been considered a suburban neighborhood in its day, but over the years it has been slowly surrounded by the city, and has become part of the urban landscape.

The site is situated north of downtown, an area that has been under some major redevelopment to bring some vitality back to a slowly dying downtown. Historically, downtown Miami was once a popular living area during the early 1900's, but has turned into a business district as most downtowns have across the United States. Located even further north of the

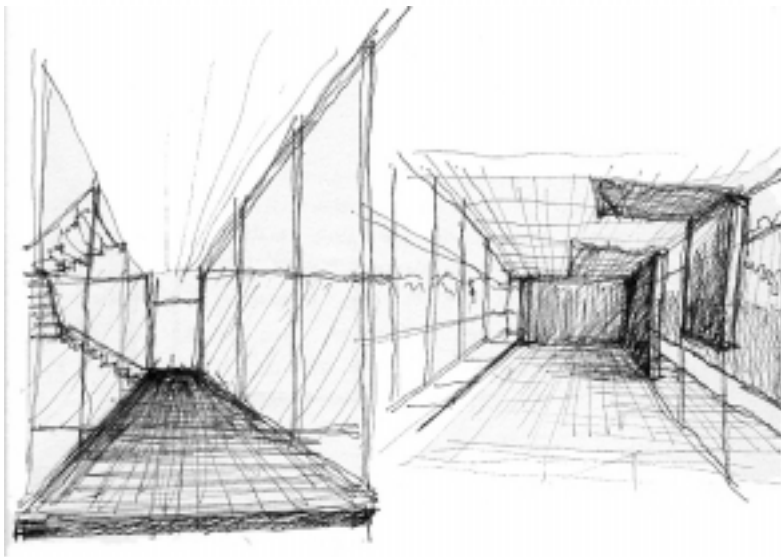
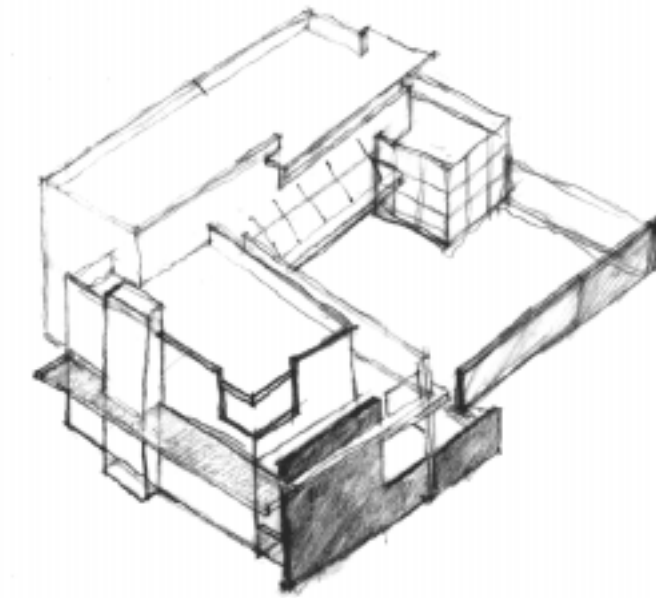


**22** Initial design idea of connecting corridors of narrow pedestrian passageways. Homes sit on the edge of lots and are inward facing providing maximum privacy. Horizontal and vertical elements are dynamic trying to avoid a direct sight line, providing a more pleasing contrast of light and shadows, **above and below.**



**23** Schematic diagram of first year graduate design project which was used as a spring board for the development one of the courtyard houses in the thesis project.

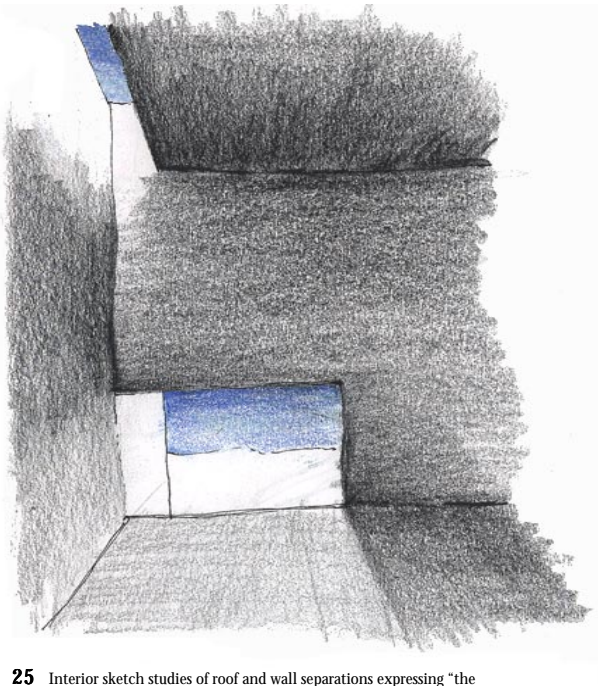
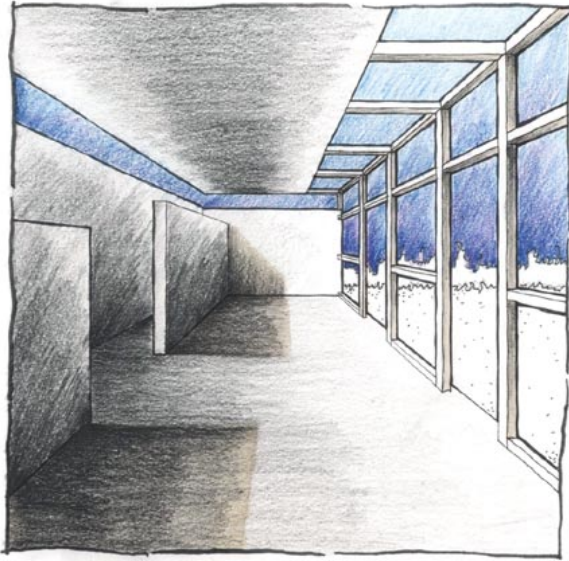




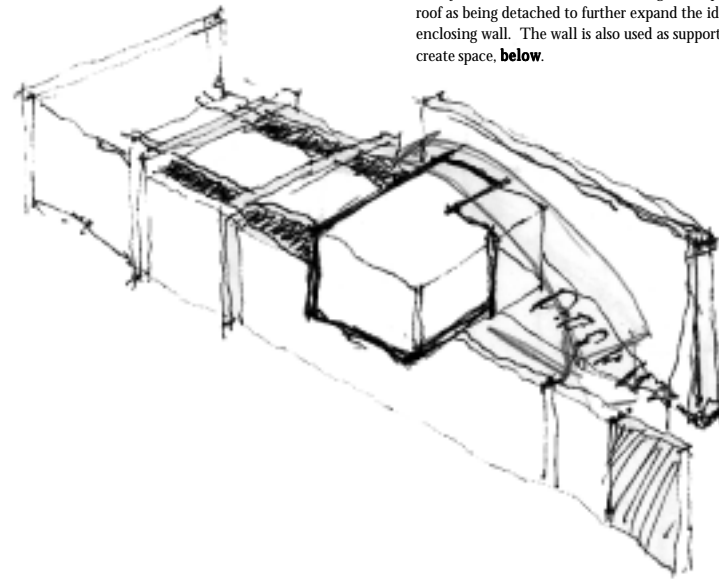
**24** Preliminary design sketch of the "u-block" courtyard house exploring possible exterior spatial relationships with structure massing, **above**. Early interior study sketches demonstrating contrasting elements of openness to the courtyard and the privacy of the enclosing courtyard wall, **below**.

site are some once-popular 1920's bungalow type houses that have now been abandoned due to the undesirable living conditions around this area. In the last ten years, some businesses, especially professional offices, have purchased some of these houses and have converted them to law offices and doctor's offices trying to turn the tide for this area. The Downtown Miami Redevelopment Authority has also pushed some major projects to instill new life into the neighborhood. Recent projects of major significance in the last ten years have been two high-rise towers adjacent to the site and the Miami Arena which was once home to the Miami Heat. New projects in the works now include a Performing arts theatre designed by Cesar Pelli.

Being that the area is in close proximity to the bay, property values in the area are quite high considering the quality of the neighborhoods. It is just a matter of time when this area would flourish again, and most people were aware of this fact. Keeping property values in mind, the courtyard homes are designed two to a lot which curtails costs and increases density, in typical urban fashion.



**25** Interior sketch studies of roof and wall separations expressing "the wall" as the primary element of enclosure, avoiding the fusion of roof and wall seen in the majority of residential structures today.



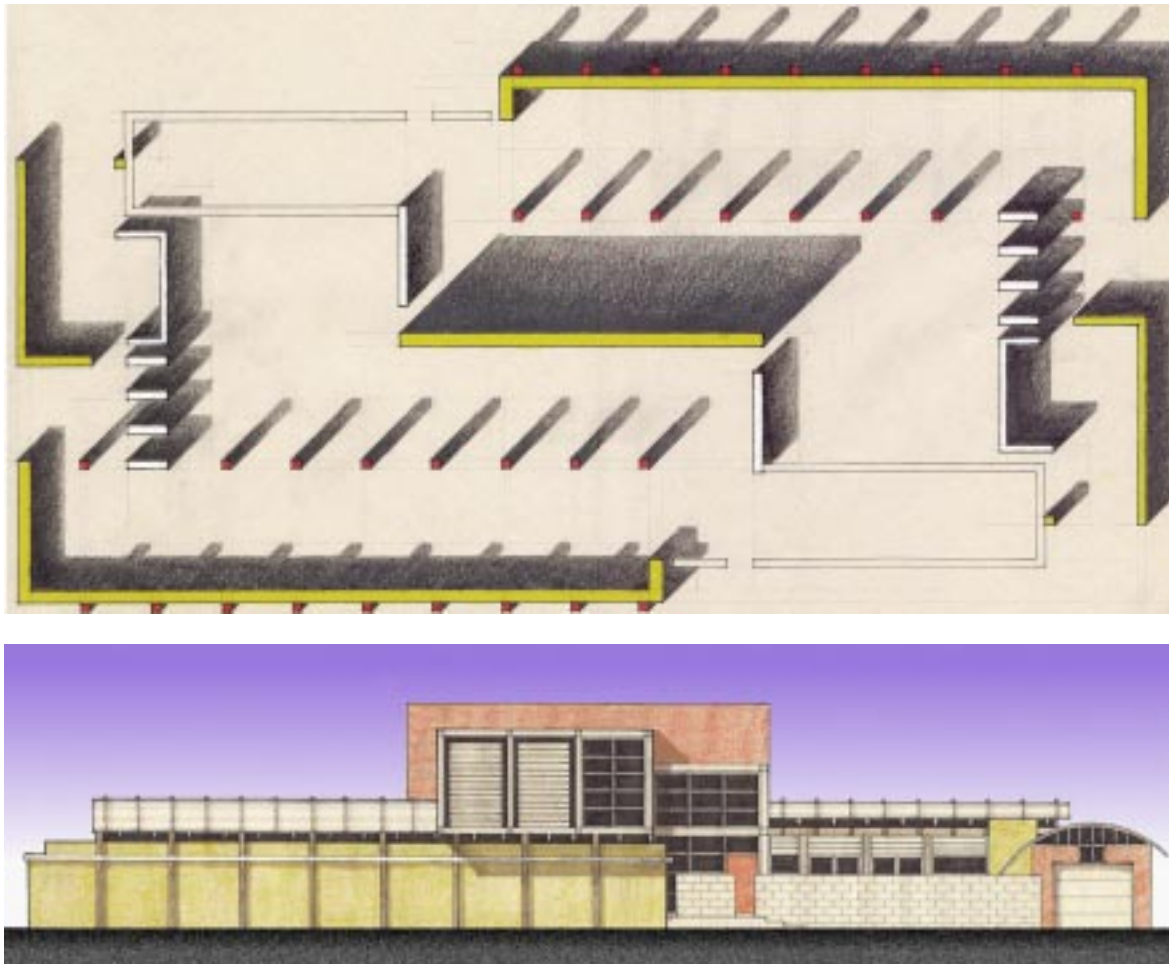
**26** Design sketch demonstrating the importance of reading the courtyard wall as enclosure. The design incorporates the roof as being detached to further expand the idea of the enclosing wall. The wall is also used as support and infill to create space, **below**.

### Project Development

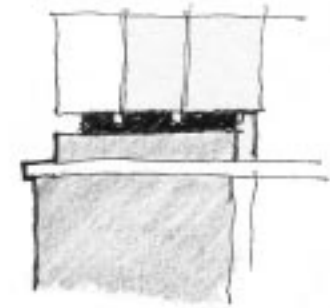
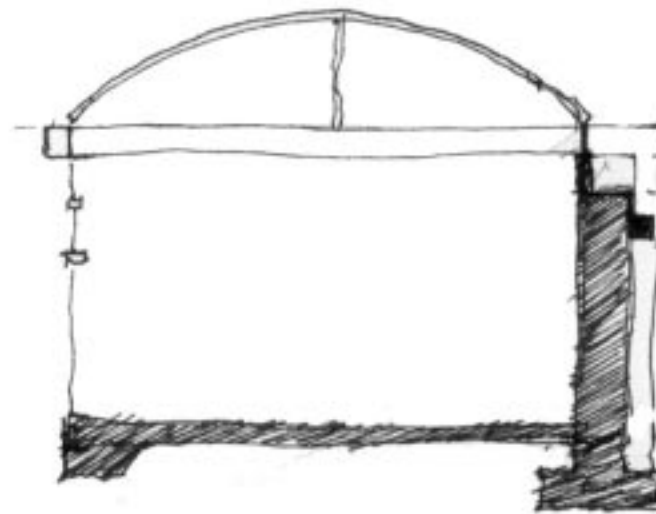
In the task of creating a courtyard house, one of the main concerns was to keep the idea of enclosure as true to itself as possible. In other words, my interpretation of enclosure around a central space needed to be manifested in the house. Many courtyard houses today claim to be atrium homes only because they have an accessible interior space which is open to the sky, but is not read as such, merely a box with an opening on the inside. Many of the early courtyard houses of Persia and China are built up around an outside space. It is an additive process of constructing around a space that is treated as a physical object, unlike the modern box, transformed through the process of subtraction to create the courtyard, as seen in the modern atrium home. The primary element of enclosure is the wall, not the box. The main palette of form needed to express the act of enclosure is the wall.

My early parti diagrams consisted of lines only. I experimented with interlocking “u” block diagrams to maximize interior and exterior space since there were tight restrictions placed by the available space on the lots. I developed three different solutions to be used as a base that would ultimately be the plans for three courtyard houses of which the community would be comprised. The layouts were kept as simple as possible: wall for enclosure and demising entities, and the columns were used as the basis for infill. The walls were to feel massive and organic, a primitive feeling of enclosure. Since there were to be different tasks for different walls, their responsibilities were expressed with dimension and material. The contrasting and dynamic qualities I was looking for in the project were beginning to appear with the massive walls and light infilled structure. The setup was going to serve well for the interior qualities of the room. Solid walls for enclosure for privacy on the street side, and lightly framed elements for the interior side which was to open to the courtyard side, a quality that was to be present in each courtyard house.

Up to this point I had been working on a one dimensional aspect of the project, which had been a horizontal platform which was resolved mostly through the plan. I needed to



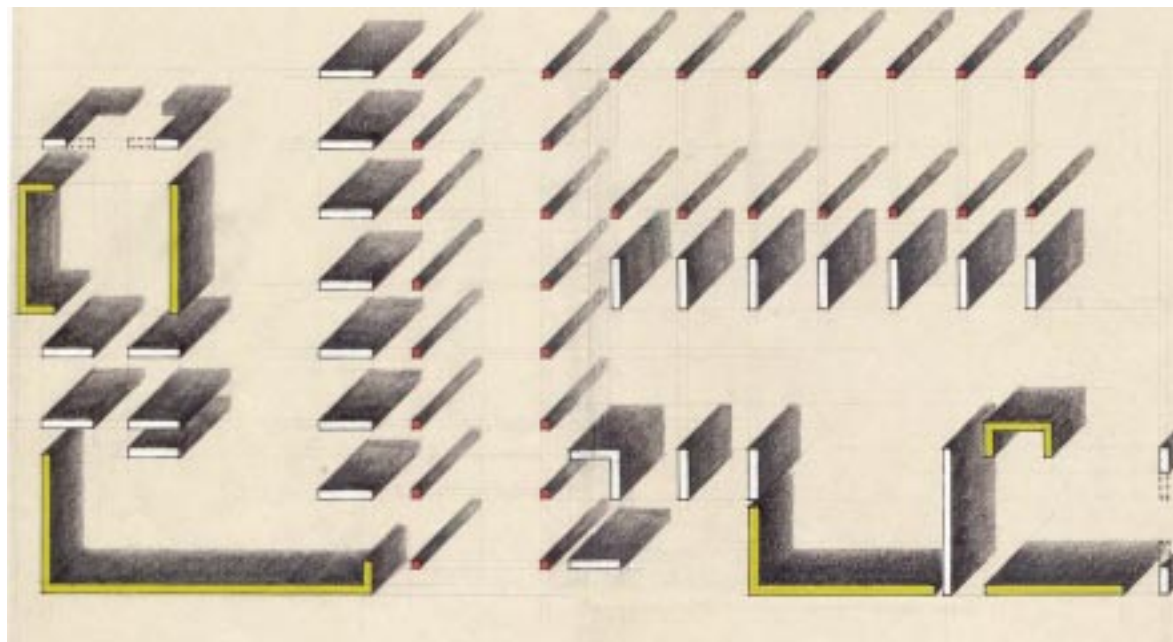
**27** Floor plan of one of the three courtyard homes diagramming the main principal elements of enclosure; the main heavy walls and the light infilled structure. **above.** Front elevation of Courtyard home. Second floor box is composed of light elements supported by large demising wall beyond, and courtyard enclosing wall, **below.**



29 Sketches of roof and wall separations studied through section and elevation, **above**.

28 Early light studies of fully glazed walls with adjoining courtyard walls five feet from glazed wall. The space in-between would be used as a garden/buffer zone between both homes. Images also tested spatial relationships of height to width ratios of the rooms within the two-story bar building. The final proposed building used a wider room based on the outcome of this rendering demonstrating a less desirable building width, **above and below**.

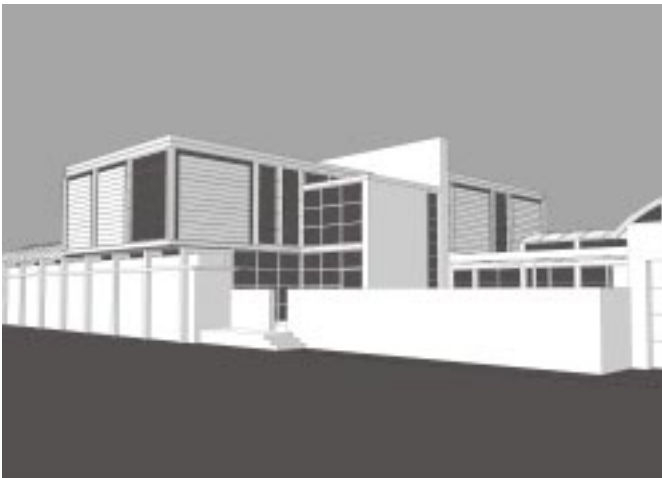
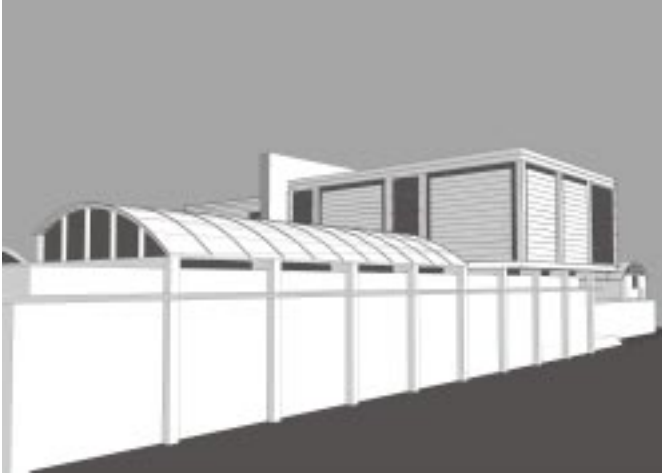




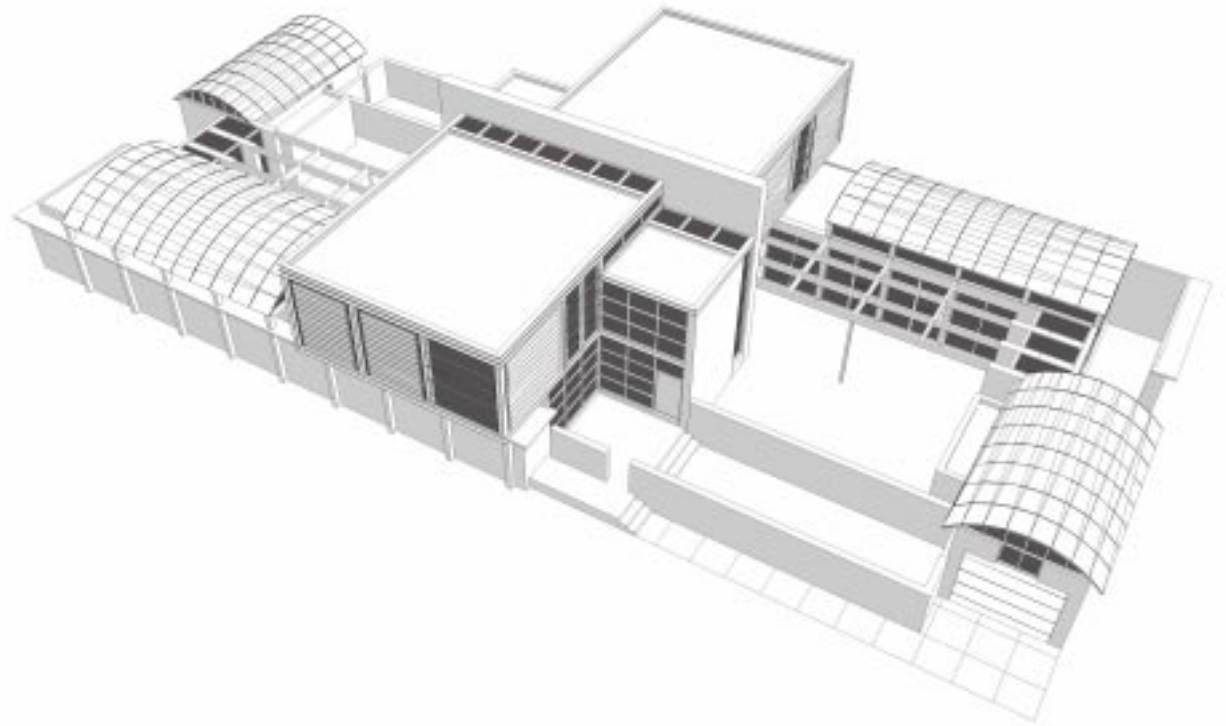
30 Diagrammatic Floor plans of courtyard houses 2 & 3 mapping main principal elements of enclosure; the main heavy walls and the light infilled structure. **above.** Front elevation of Courtyard home. Second floor box is composed of light elements supported by large demising wall beyond, and courtyard enclosing wall, **below.**

try and remain true to the idea of enclosure even when vertical elements were incorporated, such as the roof. The thoughts that enclosure was primary in my project had to remain even when a roof was attached to a series of walls, I had to make certain that this thought was not lost once the walls were roofed. Many homes today seem like boxes because of the pitch walls above the vertical walls. In essence the walls and roof become fused as one, and the feeling of “wall” is lost and the feeling of box takes over the whole structure, easily seen in the typical gable roofed home. In order to prevent this box effect, I had to design a roof that was detached from the walls which could be read as a roof so the walls could be read for what they truly are. The project incorporates two different roof types over the main ground floor enclosure: a curved roof and a flat roof both detached from the walls. In both cases, the roofs were supported by the structural framework of the structure that was common within all the buildings. In this fashion the main courtyard wall still read as the main generator of enclosure, and the roof became another system of enclosure on a different dimension.

The use of columns and concrete piers were used as the secondary means of enclosure and infill. The columns and piers set up a rhythmic organization among all three buildings and were set up on grids of eight and sixteen feet. This similar structural framework among all three buildings made it possible to have interlocking pieces which complemented each other on the site, and carried a cohesive architectural language that was common throughout the community. Within the framework of the columns, enclosure was accomplished through a series of infilled panels. Variations and transparency of these panels were determined by the different locations and tasks to which the panels were assigned. The composition of the panels were made up of either masonry, stucco, or wood. Some of the panels are filled solid within the structural framework of the building, and others were left with a sliver of glass between the panel and framework. This setup accomplished privacy when needed but also allowed sufficient natural light within the room. An integrated consistent architectural language was necessary for a successful merger of three different structures onto one site, and the block as a whole.

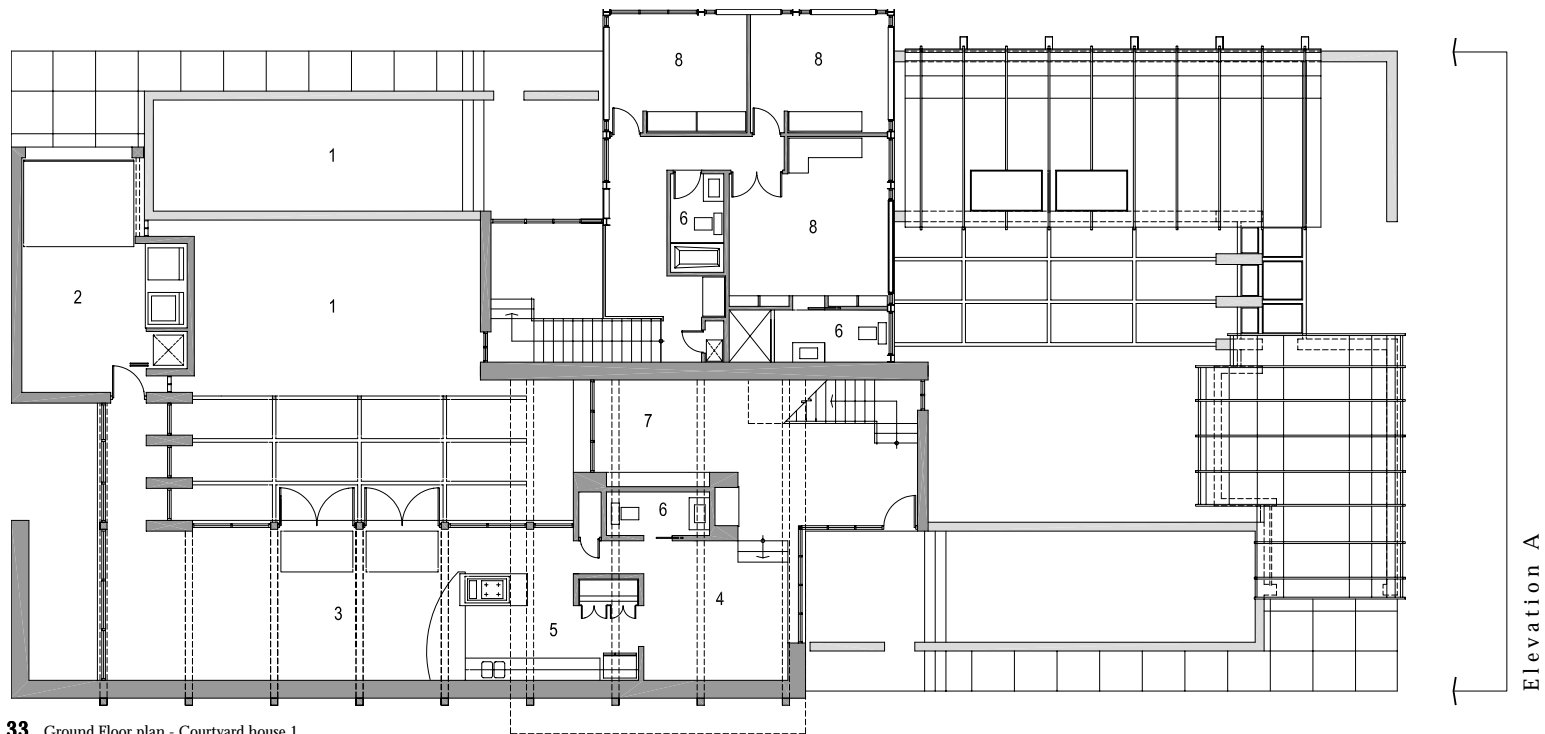


**31** Ground level perspectives of courtyard home 1: The street side is private to the residence from passing pedestrians, yet retains certain open features which allows quick limited partial views into the courtyard, which creates a certain feeling of mystery, **top and bottom.**

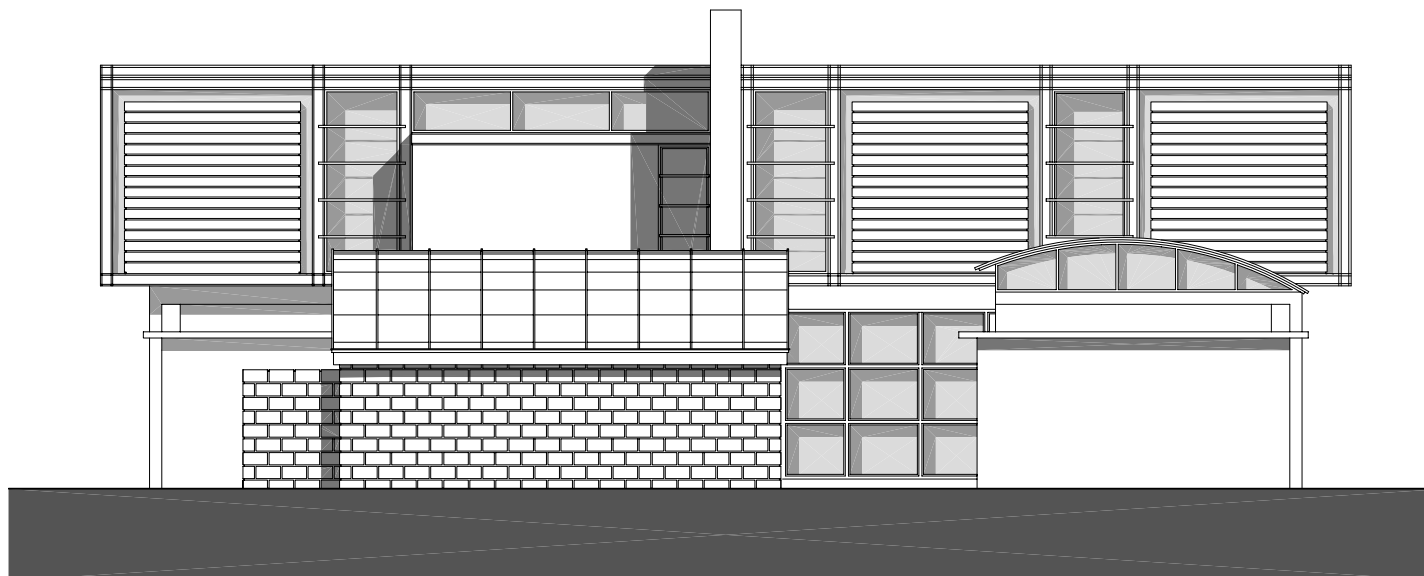


**32** Bird's eye view of courtyard home one: Two homes are placed on one typical suburban lot. Both homes are identical models, but are flipped and reversed onto each other. The entrances to the homes are on the opposite sides of the garages, thus forcing the occupant to make use of the garage and conceal the automobile, **below.**

33 Second Floor plan - Courtyard house 1

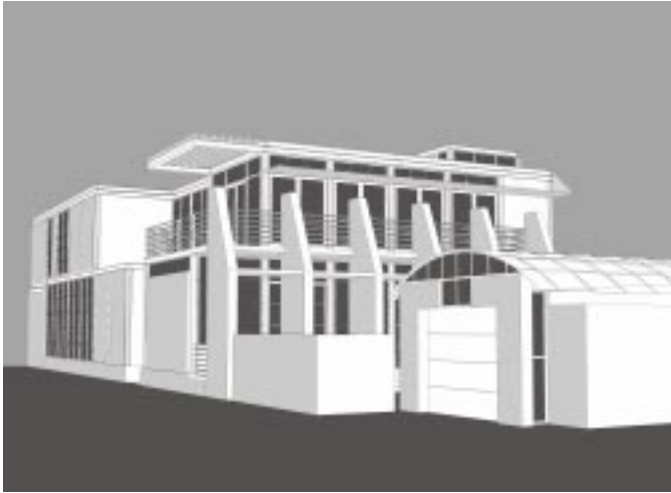


33 Ground Floor plan - Courtyard house 1

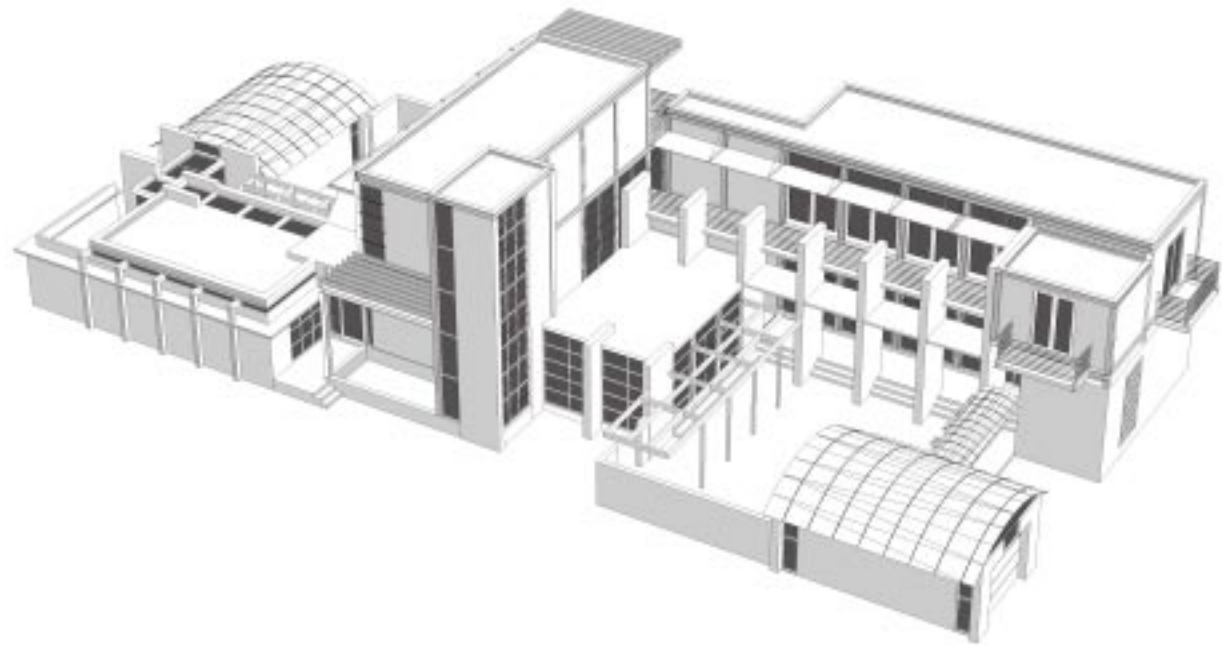


- 1 Courtyard
- 2 Garage
- 3 Living/Family Area
- 4 Dining
- 5 Kitchen
- 6 Bath
- 7 Computer/Office

34 Elevation A - Courtyard house 1

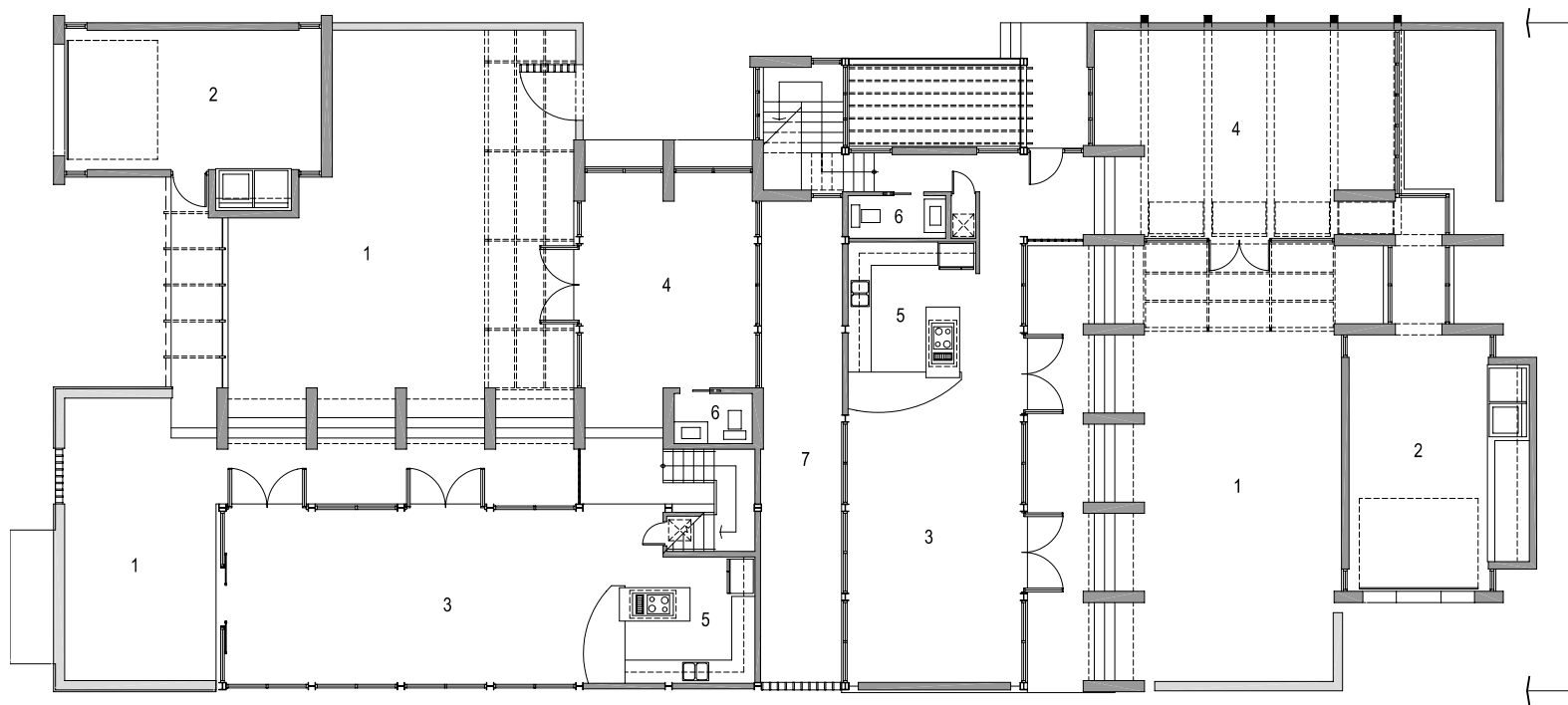


**35** Ground level perspectives of courtyard houses 2 & 3: As with courtyard house 1, the street side is private to the residence from passing pedestrians, yet allowing enough natural light into building. The architectural language hints at a cohesiveness among all three models making them belong to the community, but at the same time still retaining their own individual characteristics.



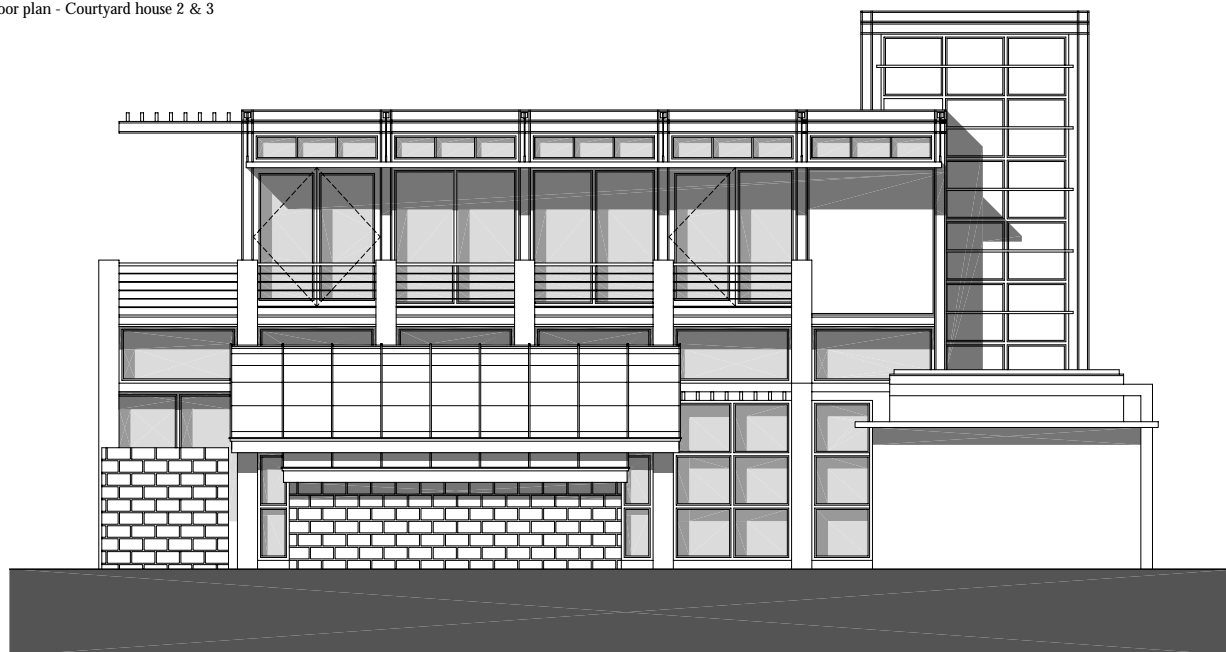
**36** Bird's eye view of courtyard house 2 & 3. Two distinct models are placed within one typical suburban sized lot. Both homes are different models, but share the same architectural tectonics and seem fused as one, but remain very private onto each other. The only space they share in common is a connecting garden of which both homes have a view, but have a blocked view into each other's house, **below**.





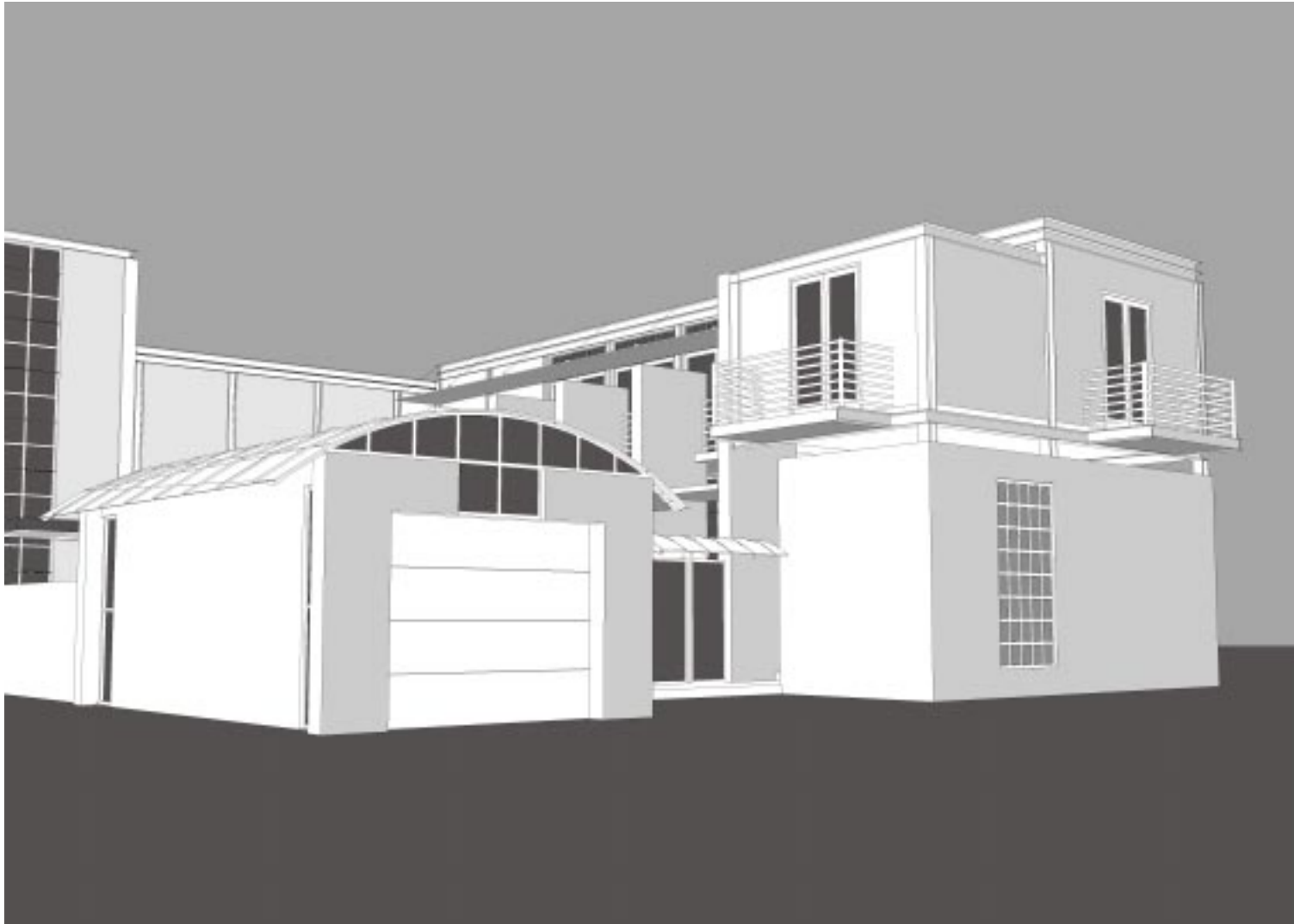
37 Ground Floor plan - Courtyard house 2 & 3

Elevation B

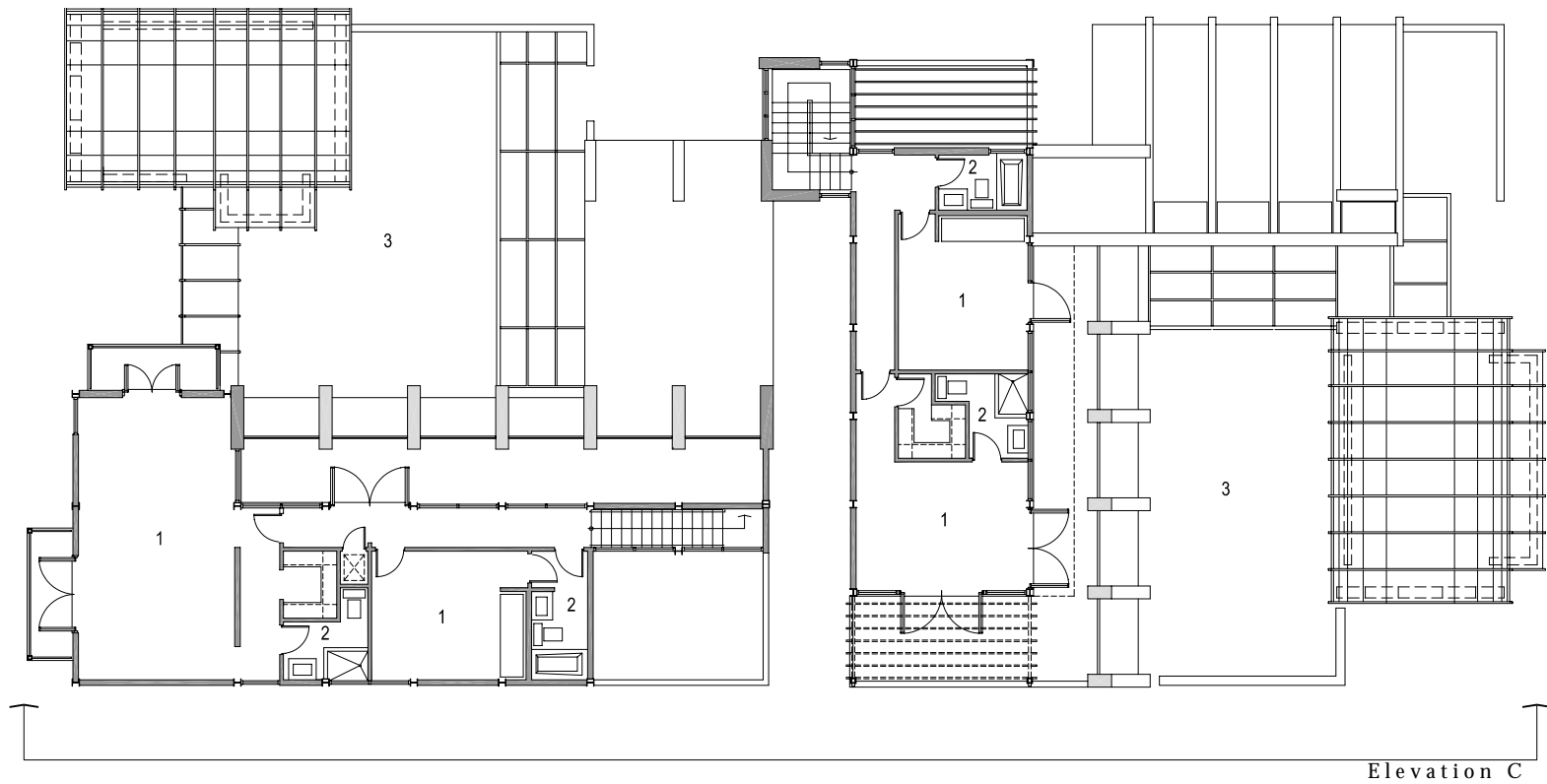


38 Elevation B - Courtyard house 2 & 3

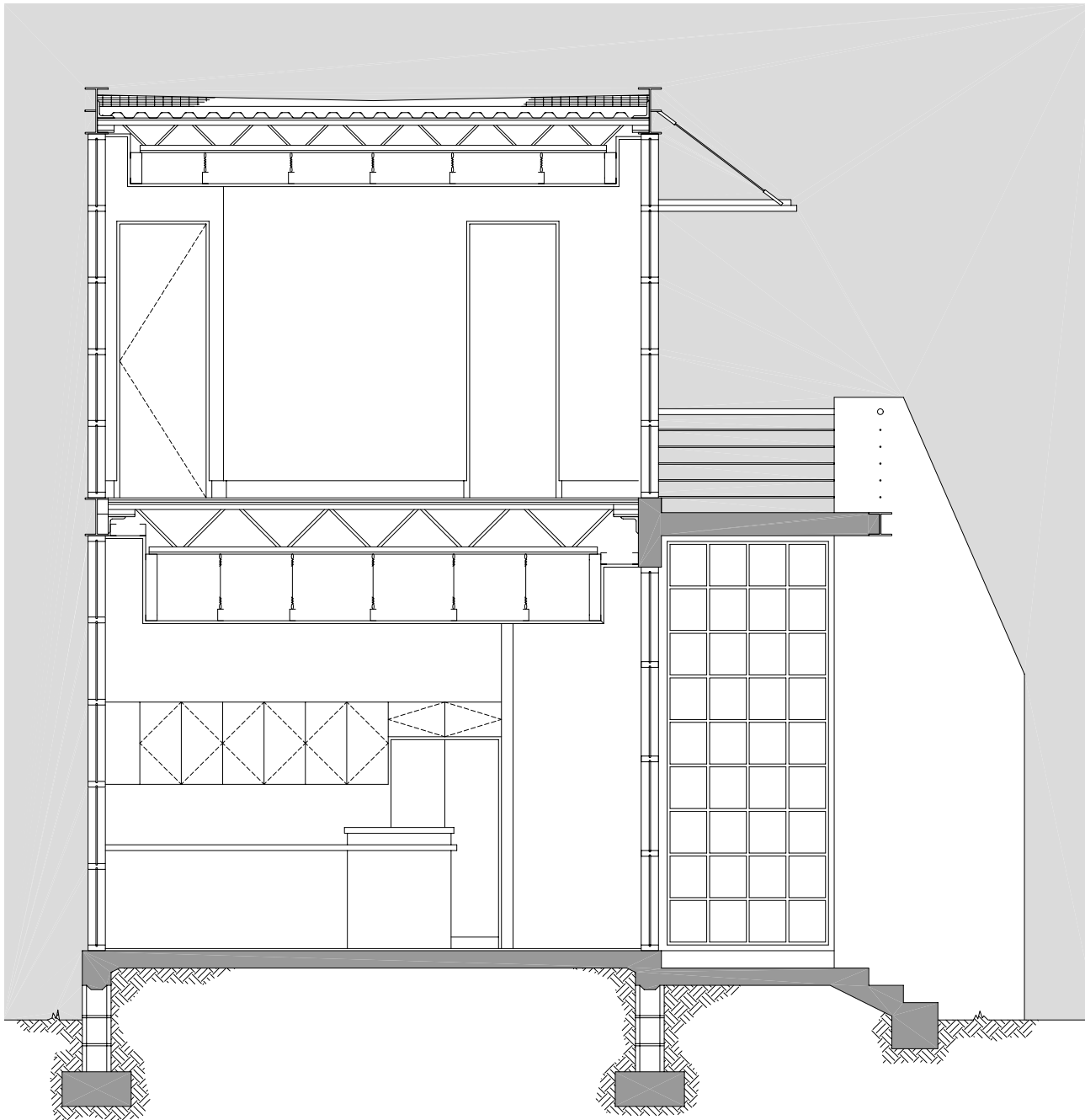
- 1 Courtyard
- 2 Garage
- 3 Living/dining Area
- 4 Computer/office
- 5 Kitchen
- 6 Bath
- 7 Garden



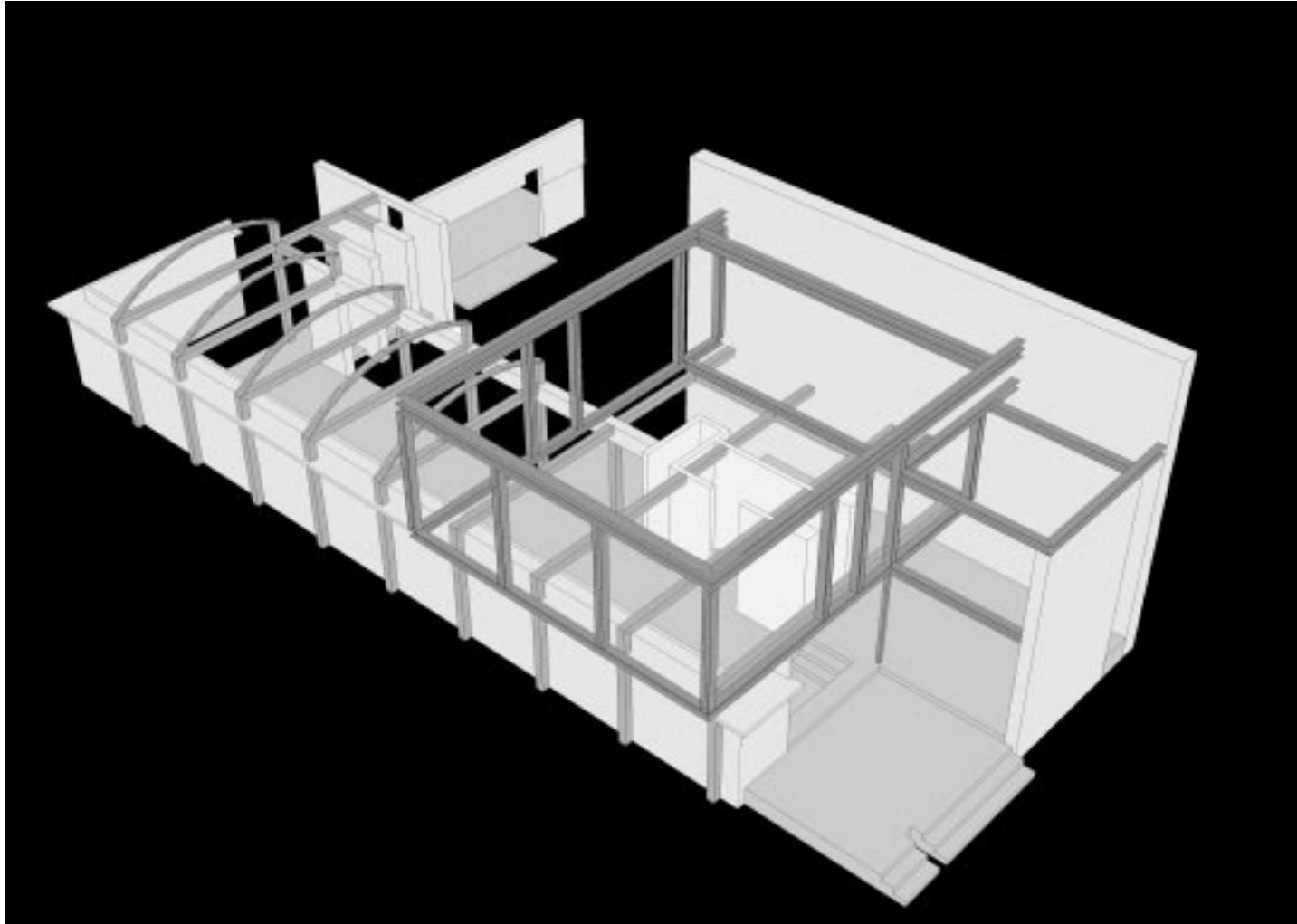
**39** Ground level perspective of courtyard houses 2 & 3: Each home has a detached garage accessible by covered walkways or accessed directly through the house by enclosed spaces. Due to limited space on the site, driveways are eliminated thus forcing the inhabitant use of the garage for the purpose for which it was intended; the housing of automobiles. This in turn will alleviate the problems of cars parked in front of the homes as seen throughout most suburban neighborhoods, **top**.



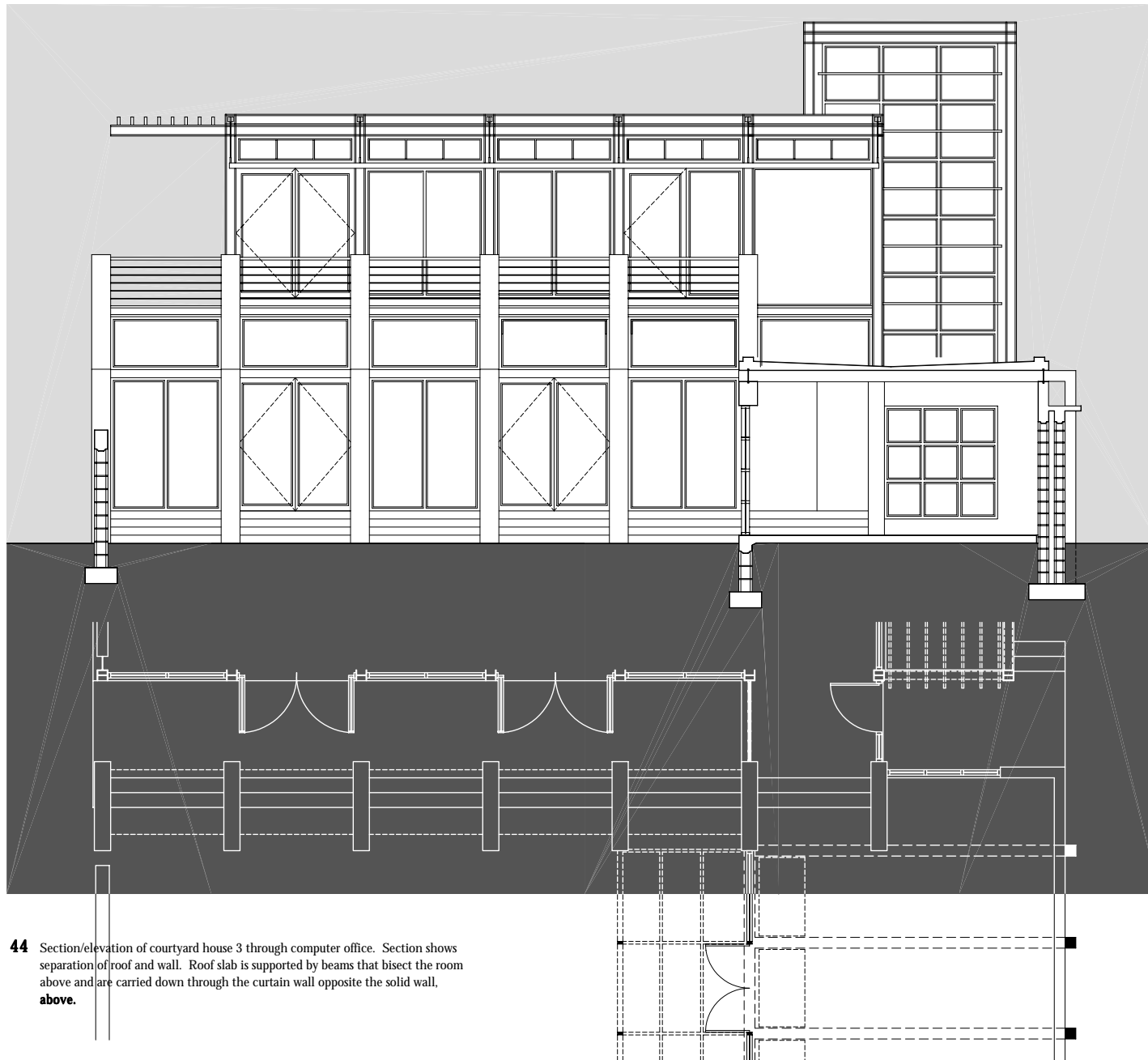
41 Elevation C - Courtyard house 2 & 3

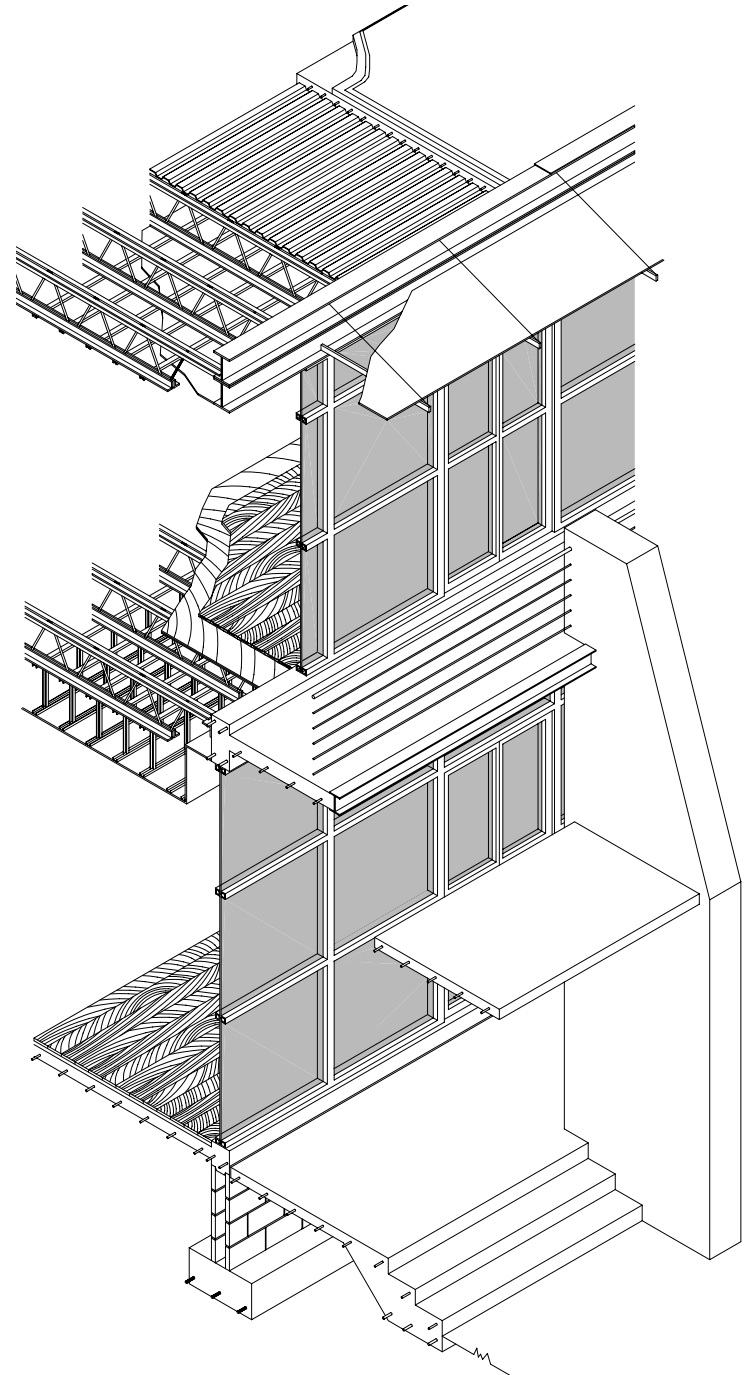


- 42** Section through two story portion of courtyard houses 2 & 3: Buildings are composed of concrete and steel. The main house is framed with steel members. Steel joists are used to support the floors and roofs. The main floor is a slab on grade. The steel frame building is then infilled with solid panels of various materials along with curtain walls of glass and spandrel panels.

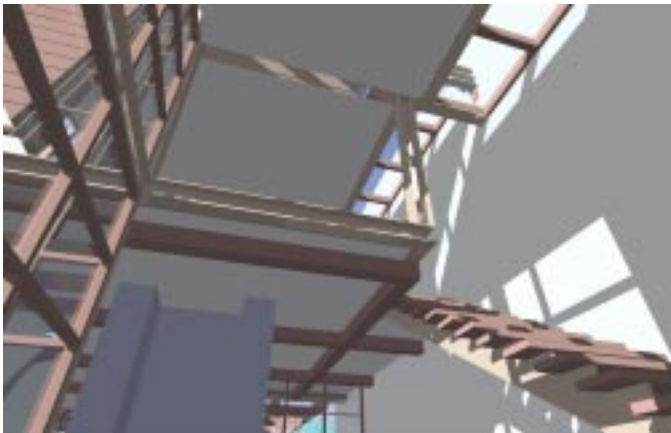
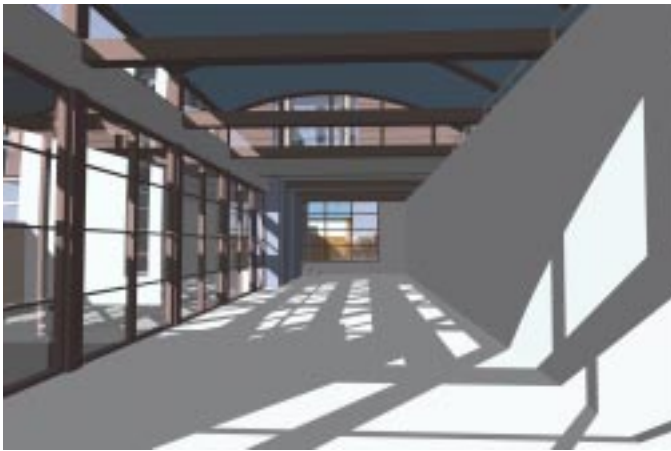
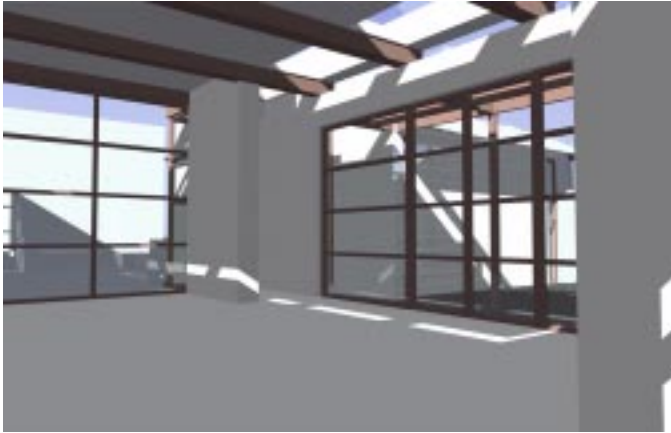


**43** Axonometric of courtyard house 1 showing different structural systems at work. Second floor steel framed box is supported by bearing courtyard wall below and large demising wall which divides the two similar homes that share the same lot, **above**.





**45** Section Isometric of typical wall section of two-story wall and balcony of courtyard houses 2 & 3. Exterior elements are made of contrasting materials, heavy organic concrete and light straight steel members.



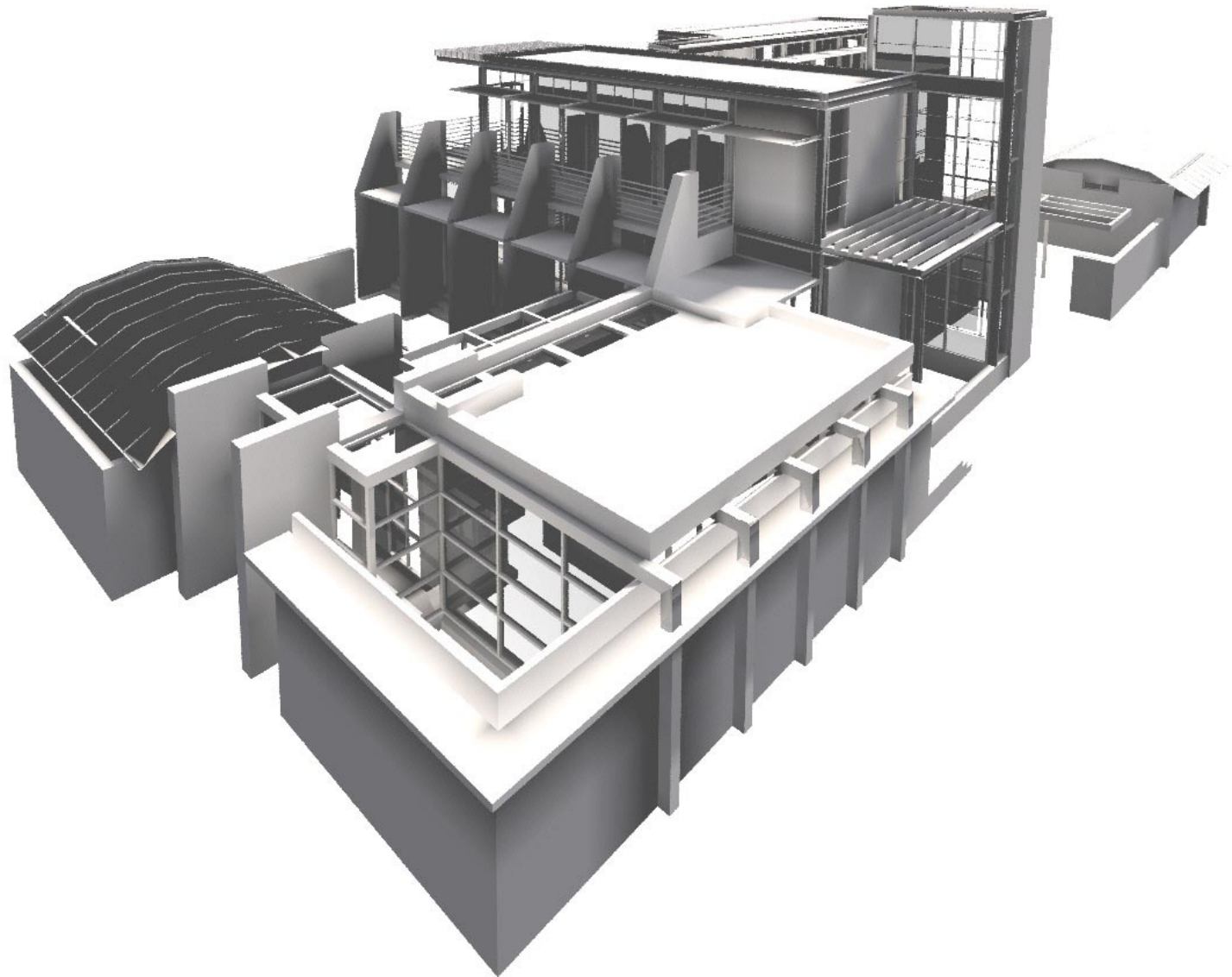
- 45** Interior rendered perspectives: Computer/office room in courtyard house 3 illustrating detached roof supported by beams, **above**. Living Area of courtyard house 1, showing curved detached roof and opposing walls of concrete and glass, **middle**. Double height space of Courtyard house 1 showing staircase being supported by massive demising concrete wall, **bottom**.



- 46** Exterior view into courtyard of house 2. House is framed and infilled around regulating concrete piers and steel columns. **above**.



47 Rendered exterior perspective of Courtyard house 2 & 3. **Below.**



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## **Vita**

Jorge del Castillo

Bachelor of Design in Architectural Studies  
Florida International University  
Miami, Florida  
1995

Master of Architecture  
Virginia Polytechnic Institute and State University  
Blacksburg, Virginia  
2000.

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