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The Building Skin | Recladding as Renovation

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Abstract

The building skin provides opportunity to significantly impact the success of a built project. It is responsible for serving a multitude of performative functions as well as providing the visiting card of the building.[1] It mediates between the in and out. The façade is often exploited and developed as a marketing tool, representing the identity of the institution it serves. As Leatherbarrow stated, "The idea of the façade as a distinct representational face of the building has existed since the late medieval and early Renaissance periods."[2] My thesis inquires if existing, run-down buildings can be renovated and rehabilitated using the building skin as the primary tool for the renovation. As buildings deteriorate and fail to have the ability to accommodate its users and modern building systems, they are often demolished. This destruction fails to take advantage of the existing structure and economic conditions as well as completely eliminates cultural recognition and identity of the community in which it is built. Renovation through recladding achieves a number of established goals. The reclad accounts for higher performance and efficiency. It also allows the client to present the proper identity and image through a high level of aesthetic quality. The thesis suggests that a renovation through a recladding process will be able to achieve the said goals as well as maintain cultural recognition and the identity of the community.

Endnotes

[1] Christian Schittich, ed., In Detail: Building Skins: Concepts, Layers, Materials (Boston: Birkhauser, 2001), 8.

[2] David Leatherbarrow & Moshen Mostafavi, Surface Architecture (Cambridge: MIT, 2005), 9.

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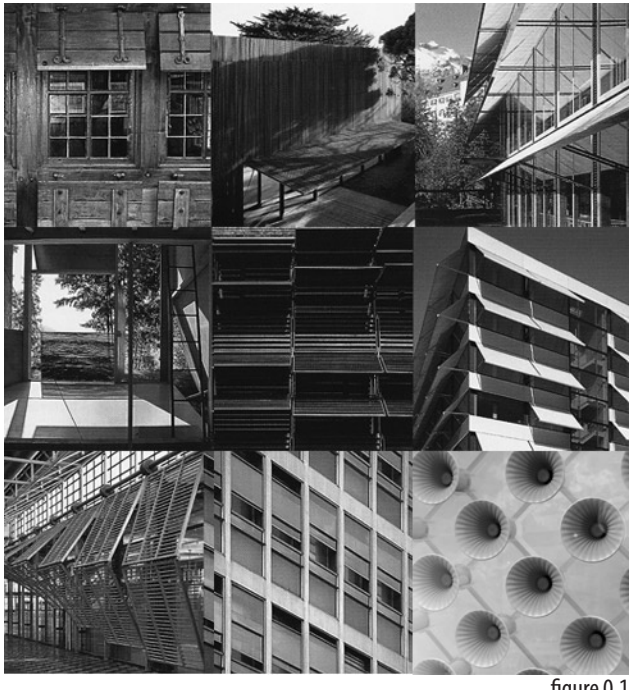

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01 Evolution & Development of Building Skin
Cultural-Historical Significance

The building skin is charged with the substantial tasks of meeting a society's expectations of performance and conforming to the identity of a particular culture. The relationship of the building façade to the overall building has become more important due to advances in technology and construction (see figure 1.0). The advances (enhanced steel properties, stone and masonry veneers, structural and high performance glazing, etc.) have allowed the building skin to evolve far beyond a protective mantle, the original reason for the building envelope (see figure 1.1). The specific functions were derived out of pure necessity. As the primary defense from the weather and outside threats, it is still debated whether the first façade was built vertically or horizontally. Regardless of whether the roof or wall came first, the purpose was the same. It was about protection.

The concept that the building skin originated out of pure necessity is best illustrated in the idea and image of the primitive hut. When Andrea Deplazes discussed Gottfried Semper's primitive hut as an act of self-creation, he describes "it is the first and most important, the moral element of architecture. Around the hut were grouped the three other elements; the roof, the enclosure and the mound, the protecting negations or defenders of the hearth's flame against the three hostile elements of nature."[1] Semper suggested that woven materials were responsible for providing the material for the original enclosing skin. This established a starting point for the forward advance of the building envelope.

In contemporary architecture, the building façade

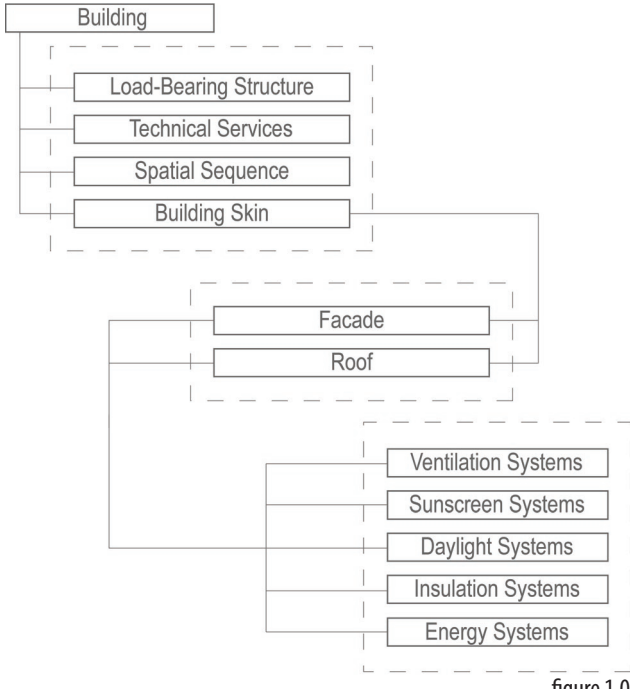


figure 1.0

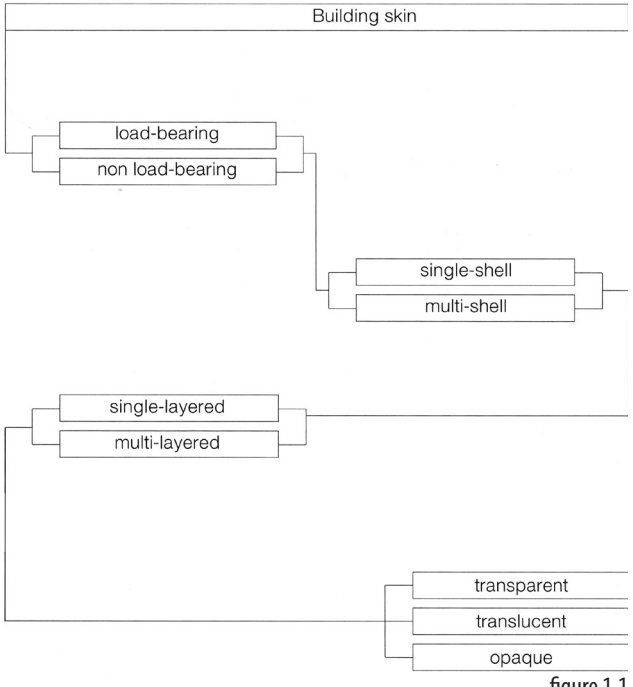


figure 1.1

is established and isolated as an autonomous architectural design. It serves the purpose of defining the interior as well as adjoining exterior spaces. The façade, which is in essence the wall, is directly responsible for defining the in and out. It has a major cultural-historical significance. Throughout history, its significance is portrayed.[2] It is intended to create a clear, visible boundary. This artificial demarcation that is created by the façade or wall is, under all respects, considered to be binding and meaningful.[3] Similar to the cultural-historical significance are the relationships derived from the type of society in a certain region, the history and ethnography, the local climate and the availability of local resources that all contribute to the design and success of the building façade.[4]

As stated in Building Skins, "the building skin is the dominant system is all subsystems of a building – the load bearing structure, mechanical service and spatial framework – not only in terms of design."[5] Beyond the cultural-historical significance, the building skin is responsible for serving a series of operational functions as well as being charged with providing the visiting card of the building. In support of that, Leatherbarrow and Mostafavi have noted, "the idea of the façade as a distinct representation face of the building has existed since the late medieval and early Renaissance periods."[6] The skin of a building is much like the skin of our bodies. While it protects the interior from exposure to the environment, it also projects a distinct identity. Consequently, similarities have developed between architecture and fashion due to their expressive natures. The concept that buildings

are essentially gigantic clothes that we never get round to hanging up in the wardrobe has been around for centuries. Because architecture is big, heavy and expensive, it should not be governed by the seasonal shifts of fashion. It has, however, been affected by much larger, slower moving paradigm shifts.[7] The Industrial Revolution introduced the capabilities of mass production, directly relating to the aforementioned advances in technology. Modernism established the "free façade," creating a distinction between the structural and nonstructural elements of the building and between the frame and cladding.[8]

01

Style, Ornament & Representation

The image, identity and brand are conveyed by the building's façade. The idea of building as image was developed as a post-modern idea. The ideas of post-modernism paid great attention to the concept that form and building can contribute to identity and meaning. The building façade is often charged with the responsibility of creating the image due to its direct interaction with the outside world. In many respects, the façade, again, is considered to be the most important component of a building. Beyond its performative functions, it makes a strong statement to the outside world, and potentially, becomes an icon.[9]

Building as image is direct result of the applied ornamentation. Even though Modernism abolished it, or at least had tried to abolish it, people in all cultures around the world continue to decorate their homes. They have practiced this decoration/ornamentation since the beginning of time.[10] For Gottfried Semper, ornamentation was a symbolic expression of a tectonic evolution. According to Semper, cladding is the architectural aspect of building. Being the principal act of architecture, cladding causes a shift away from structure and places the focus on the enclosure, emphasizing textile.[11] For Adolf Loos, ornament is criminal. Loos' rationale is related to the material deception often accompanied with ornamentation. Although he did not agree with Semper, he was not completely adverse to the ornamental, decorative nature of materials. Even with no structural reason for this highly refined and excessively rich material use, there was a sensuous and culturally justified need for these materials. Loos expressed

his ideas about façade cladding in his commentary on clothing, "To be dressed correctly…is to be dressed in such a way that one stands out the least."[12]

Beyond a fashionable packaging, the building skin can serve as an information carrier. This technique of carrying information has been used in some of the earliest forms of architecture. For instance, a Gothic cathedral and its stained-glass windows intend to tell elaborate stories. In the Bibliothéque Sainte-Geneviéve, architect Henri Labrouste presented through the exterior the purpose and program of the interior. As critiqued in The Builder in 1850, the façade is described:

> The façade is simple – we would say plain – having little ornament and less variety, and is relieved almost solely by the multitude of names of celebrated authors, of all times and countries, which are cut in tablets let into the walls on every side, and nearly covering them…Above and below…are festoons of flowers…: beyond this nothing can exceed the severe plainness and originality of the building.[13]

Labrouste, with the Bibliothéque Sainte-Geneviéve, fused form and meaning. He used the building's façade, the upper story that corresponded to the location of the books on the interior, to inscribe the characters of the names of the principal authors. The large characters reveal the authors and writers who created the works preserved in the interior of the library. For Labrouste, this monumental catalogue is the principal decoration of the façade, just as the books themselves are the

most beautiful ornament of the interior.[14]

01

Building as Image

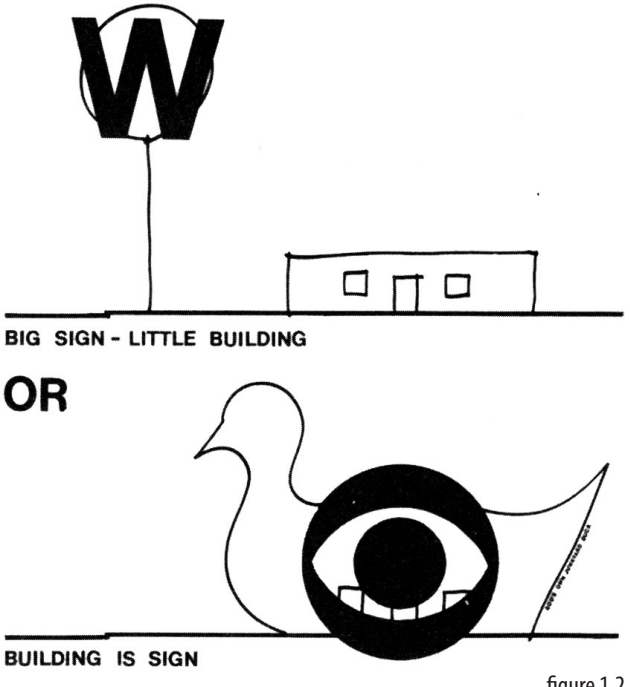


figure 1.2

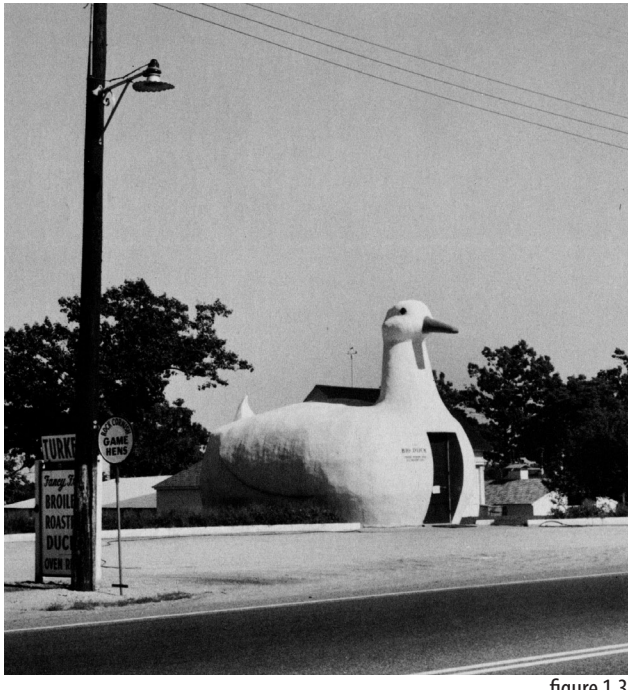


figure 1.3

Just as Gothic cathedrals related elaborate stories, contemporary architecture is able to transmit messages. Identity and branding, the idea of reading architecture like a billboard, is best analyzed through the writings of Robert Venturi. While some found the signage nature of the buildings of Las Vegas to be appalling, Venturi embraced the contemporary city. In his writings, he used the city of Las Vegas as a symbol for the everyday, the ugly and ordinary in Modernist debates on architecture. Venturi claims that not only should architects accept the aesthetics of America's commercial popular culture, but also that this aesthetic could serve as the starting point for a contemporary architectural design.[15]

Venturi presents two conflicting ways of representing meaning. In the theory of the decorated shed, he divides the house into 'volume' and 'façade,' assigning the role of an autonomous meaning carrier to the façade. To contrast the decorated shed he envisions a "duck," a building that derives its form from its function (see figure 1.2).[16] Venturi, an advocate of the decorated shed opposed to the duck, proposes that by understanding and adopting the techniques of Las Vegas' buildings and signs, designers could enrich the symbolic content of post-modern architecture (see figure 1.3).

In a more contemporary view, architects Herzog & de Meuron are pioneers of building skin as image. From early in their careers, these architects experimented with various possibilities of ornamentation, in order to reflect the complexity of human understanding. They view architecture as an act of communication, not represented by fixed forms but by an

figure 1.4

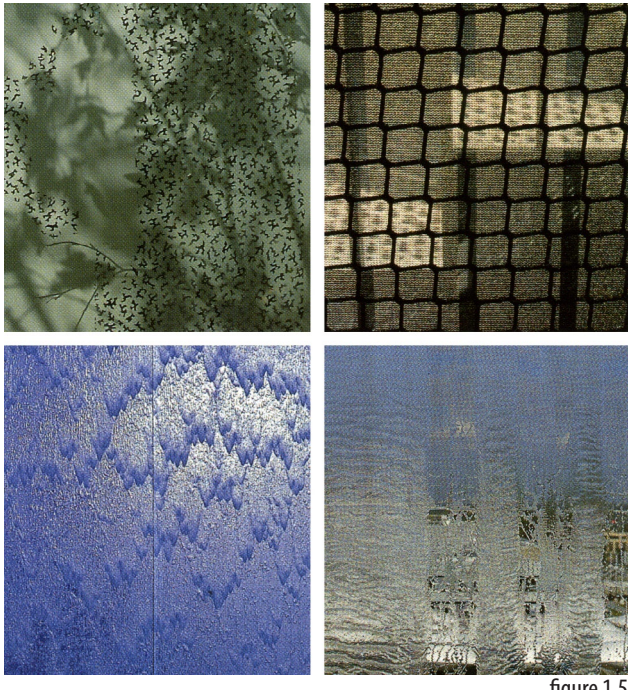


figure 1.5

oscillating field of perception. Architecture offers a way of thinking that should offer many incentives for becoming aware of oneself and the world. Their views are expressed in their project, the Library of Eberswalde Academy, built in 1999 (see figure 1.4 for graphic communication through the skin). The exploration of material and surface is one of the principal themes in their works (see figure 1.5 for investigative materials uses).[17] In many of their works, Herzog & de Meuron include an artist or photographer. In a few examples, photographer Thomas Ruff selected the motifs of photos to include in the project. Their work is often intended to tell a story and transform the façade into a projection screen.[18]

01

Independence from Structure

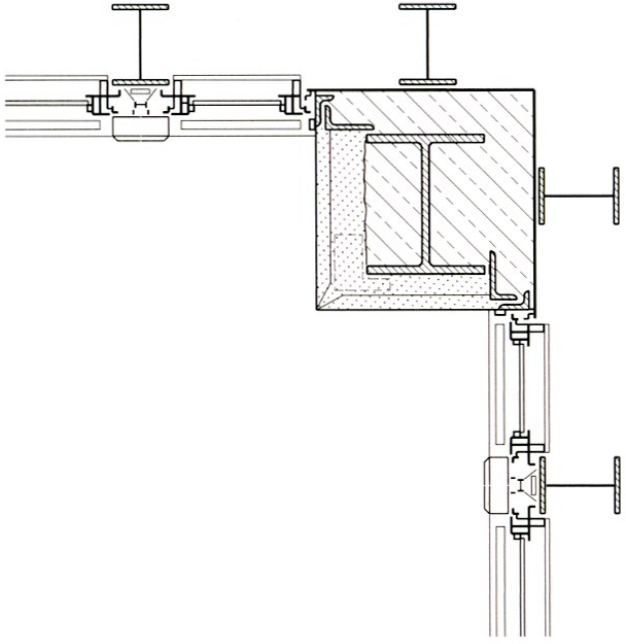


figure 1.6

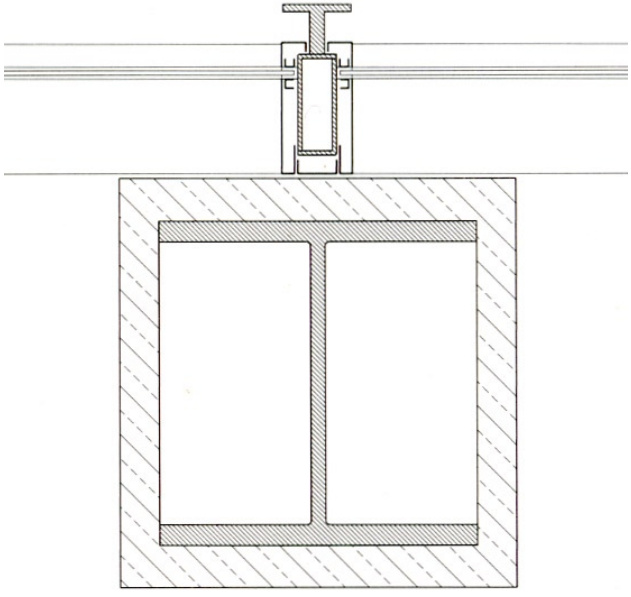


figure 1.7

In the evolution of the building skin, the most important advancement was the freedom from its structure. As Leatherbarrow states, "Once the skin of the building became independent of its structure, it could just as well hang like a curtain or clothing."[19] This freedom from structure provides the opportunity for much further advances in design. Due to it's the independence from structure, a wide variety of materials could be used within the curtain wall. A vast array of aesthetic appearances could be achieved. From a performance standpoint, the skin was now more available. In an early example if high performance, the Steiff factory building in Geingen in Southern Germany employed a double skin system. The function of this project was the primary driver for design. To achieve the maximum amount of light on the interior of the factory, the exterior was glazed as the primary component. The interior façade of the double-layer system was responsible for monitoring a specific airflow and ventilation.[20]

Innovation began to run its course through the development of the curtain wall. In the 1950's, nearly thirty years after the building skin became independent from structural responsibilities, architects such as Mies van der Rohe began to creatively integrate skin and structure. In his high-rise buildings on Lake Shore Drive in Chicago, Mies reinterpreted the curtain wall system to create a new set of aesthetics. In his design, he suspends "double-T" sections on the exterior to emphasize the verticality of the building (see figure 1.6 for plan detail). Similarly innovative, the architecture firm of SOM created a light curtain wall on the Lever Building in New York

City. This curtain wall appears to be completely detached from the structure, only attached by discrete point connections. By separating the skin from the structure and the use of the curtain wall, SOM was able to achieve a building that is hermetically sealed with a high level of visibility through the fixed glazing system (see figure 1.7 for plan detail).[21]

Predominantly, the curtain wall is characterized through its use of glazing. It provides an unobstructed view from the inside as well as the outside. The draped system is admirable for detaching the expectations of what the wall should traditionally achieve. The early load-bearing masonry walls, providing little opportunity for openings and innovation, have evolved into elaborate systems that can account for any aesthetic or performative attribute. In recent years, the façade has become increasingly significant due to its unconventional choices of materials and use of innovative technology. Without its freedom from its load-bearing responsibilities, the possibilities for design would be much more confined.

Endnotes

[1] Gottfried Semper, The Four Elements of Architecture, trans. by Mallgrave & Herrmann (Boston: Cambridge, 1989), 102.
[2] Andrea Deplazes, ed., Constructing Architecture: Materials Processes Structures, 2nd Edition (Basel, Birkhauser, 2005), 186.
[3] Ibid.
[4] Thomas Herzog, et al., Façade Construction Manual (Boston: Birkhauser, 2004), 12.
[5] Christian Schittich, ed., In Detail: Building Skins: Concepts, Layers, Materials (Boston: Birkhauser, 2001), 29.
[6] David Leatherbarrow & Moshen Mostafavi, Surface Architecture (Cambridge: MIT, 2005), 9.
[7] Tom Dyckhoff, "Skin + Bones: Parallel Practices in Fashion and

Architecture," The Times Online, http://entertainment.timesonline.co.uk/tol/arts_and_entertainment/visual_arts/article3802076.ece.
[8] Leatherbarrow & Mostafavi, 8.
[9] Richard L. Peck, "Trends and Realities in Building Facades," FM Healthcare, http://www.fmhealthcare.com/2010/03/13/trends-and-realities-in-building-facades-articles
[10] Schittich, 10.
[11] Gottfried Semper, Style in the Technical and Tectonic Arts, trans. by Mallgrave & Robinson (Los Angeles: Getty, 2004), 50.
[12] Leatherbarrow & Mostafavi, 68.
[13] Neil Levine, "Reading the Bibliothéque Sainte-Geneviéve," The Architecture of the Ecole des Beaux-Arts (New York: MIT, 1977), 346.
[14] Ibid, 325-257.
[15] Robert Venturi & Denise Scott Brown, Learning from Las Vegas: The Forgotten Symbolism of Architectural Form (Cambridge: MIT, 1977), 87-92.
[16] Schittich, 22.
[17] Ibid, 23-25.
[18] Philip Ursprung, ed., Herzog & de Meuron: Natural History (Montreal: Lars Muller, 2002), 13-40.
[19] Leatherbarrow & Mostafavi, 8.
[20] Schittich, 12-14.
[21] Ibid, 14-15.

02 Building Envelope
Evaluation Criteria

The building envelope can be characterized by many attributes, each distinctly different. Although orientated differently and serving unique roles within the envelope, façade and roof are both considered under the guise of the envelope or the skin. The primary purpose of the facade is to protect what is inside from the outside as well as provide the proper mediation between the two. It does, however, also have many secondary purposes that can be found under the considerations of culture, economy, technology and energy. Through the proper planning and design of this building skin, the tasks and functions can be appropriately achieved. The success is also dependent on the results of the chosen materials and structural system. Gottfried Semper states the important of abiding to these structural and mechanical laws of material when he stated:

> Architecture is an art of pure invention. Unlike the other arts, it does not find its patterns in nature; it is an unencumbered creation of the human imagination and reason. In consideration of this, architecture could be considered the freest of all arts were it not also dependent on the laws of nature in general, and the mechanical laws of material in particular. For, regardless of which artistic creation of architecture we look upon, it was primarily and originally always conceived to satisfy particular material need, primarily that of shelter and protection from the onslaught of climate and the elements or other hostile forces. And since we can gain such protection only through combining the materials nature offers us into solid structures, we are always forced to adhere

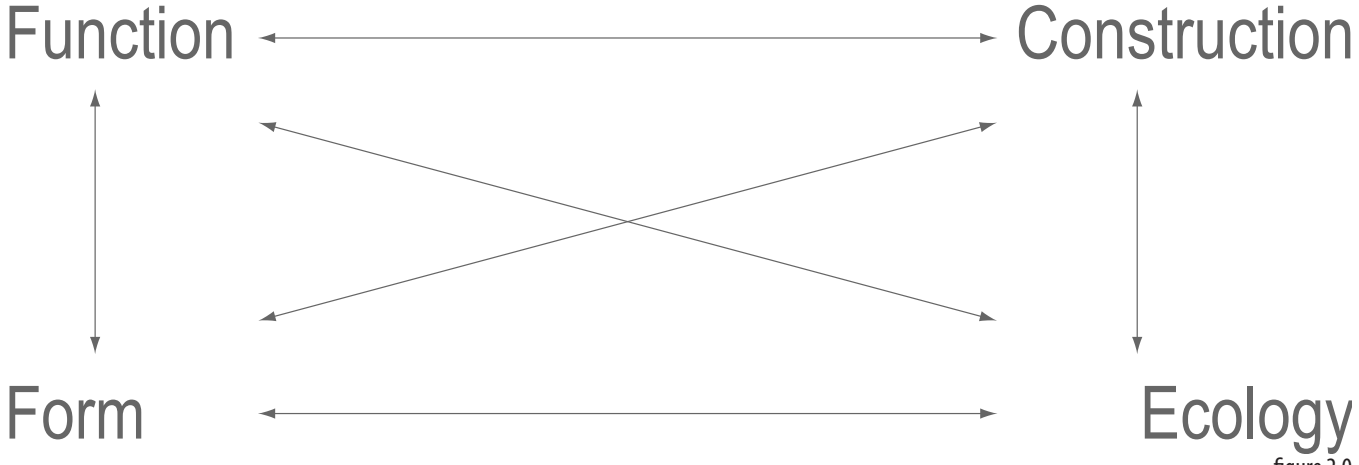


figure 2.0

closely to the structural and mechanical laws.[1]

To evaluate the building skin objectively, it is best to consider the essential functions of its existence. The four fundamental functions of the building skin are characterized by function, construction, form and ecology (see figure 2.0). Each represents a specified area of expertise that the building façade must command. Function considers the practical purpose of the building skin. It inquires why the skin exists and how it is completing its assigned tasks. Construction responds to the elements and components of the building skin. It corresponds to how these elements are assembled into a whole to provide protection and identity for the building. Form is the appearance of the skin. It relates to the aesthetic quality and the image it portrays to the public. Last, ecology represents the energy consumption of the building skin during construction, use and demolition. Creating a building envelope can be very demanding on resources, economy and energy.[2]

Each of the four fundamental functions of the building envelope must be given an equal weight in the design and construction process to be considered successful. While particular design advantages can be achieved through more attention to a certain category, it is integral to understand that each are interdependent and command a strong influence on one another. For architecture to be considered Semperian, particular issues must be allowed to take priority over others. For all to be given equal weight in the design and construction, it can be developed through reason instead of being a "pure art of invention."

02

Expectations of the Skin

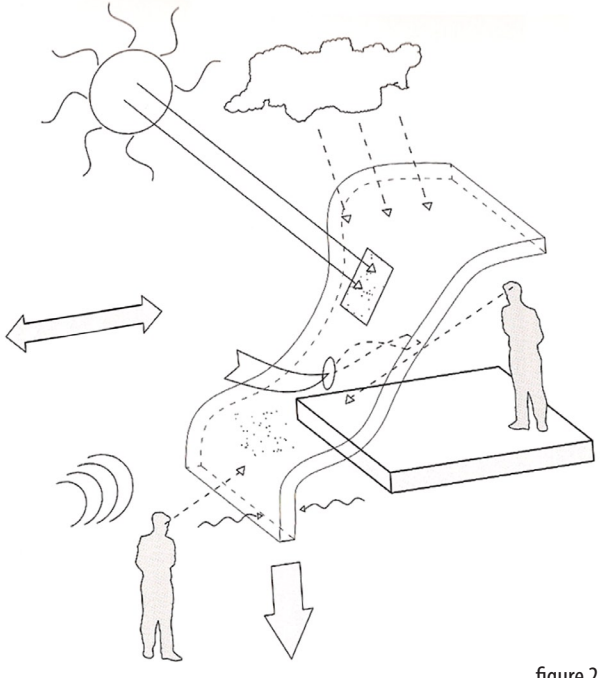
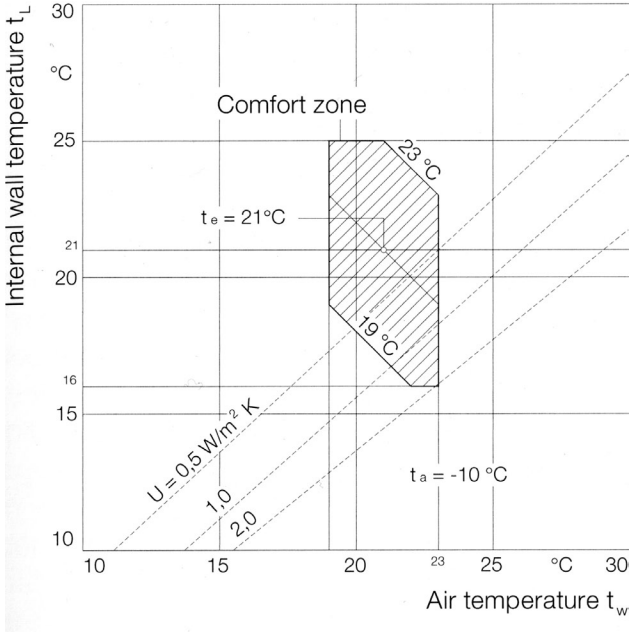


figure 2.1



Comfort parameters [4]

figure 2.2

The four fundamental functions that the building envelope must incorporate can be further specified. Function, construction, form and ecology serve as over-arching categories that are subdivided into individual tasks of the skin. The complexity of the requirements of the skin can be represented with the function diagram. The many individual requirements of the building envelope include admitting natural light, providing for proper ventilation and protecting the interior from the many elements, such as wind, sun, glare, rain and noise. Other requirements consist of providing views from the interior and screening those from the exterior. Load distribution, prevention of mechanical damage, fire protection and security issues are also major considerations of the skin. Last, as mentioned previously, the skin is charged with providing the architectural appearance of the building (see figure 2.1 for requirements diagram).

In earlier forms of the façade, internal comfort of patrons was driven primarily through the use of high-performance air-conditioning systems (see figure 2.2 for comfort diagram). More recently, due to more research and development with the building envelope, it has been given more responsibility to conserve energy. Within its responsibility to conserve energy, it must operate within a set of parameters. The set of parameters are derived from comfort and building services and relates to regulating the internal conditions of a building against the concurrent exterior conditions. One must focus on both user requirements and climatic limitations to minimize the overall energy consumption. The heating energy,

cooling energy and artificial lighting are the energy end results from the combination of issues such as air change, luminance and indoor air humidity with opposing issues of air movement, outdoor air humidity and solar radiation.

Endnotes

[1] Christian Schittich, ed., In Detail: Building Skins: Concepts, Layers, Materials (Boston: Birkhauser, 2001), 29.

[2] Ibid, 29.

03 Recladding the Existing

Recladding as Renovation

The building skin offers great potential in its use within a building system. Its role requires interaction with every other system that makes up a building. It has the capability to influence the building in multiple, crucial ways. My thesis inquires if the building envelope could be utilized as a tool for renovation of buildings that are in need of imminent repair or at risk of being torn down due to their existing conditions. These buildings typically exist in run-down, mixed-use neighborhoods. Although they are blighted and declining in quality, they provide a sense of cultural identity and recognition for the community. Rather than demolishing the existing buildings due to their deteriorated conditions, the building skin could offer a means of renovation that would allow the existing structure to be maintained (see figure 3.0 for thesis essay diagram).

In many situations, dilapidated buildings in these neighborhoods are demolished in order to revitalize the area with less than optimal development. The buildings are often razed for having numerous deficiencies. They are characterized by deteriorating materials, poor performance and efficiency, substandard aesthetic quality, an inability to accommodate modern building systems and an absence of identity. A common end result to the combination of these problematic conditions is razing and rebuilding. When buildings are demolished, a number of damaging affects result. Initially, there is a clear disregard of existing, usable elements. The structure of these neglected buildings are often able to continue to serve their purpose by providing a proper framework for

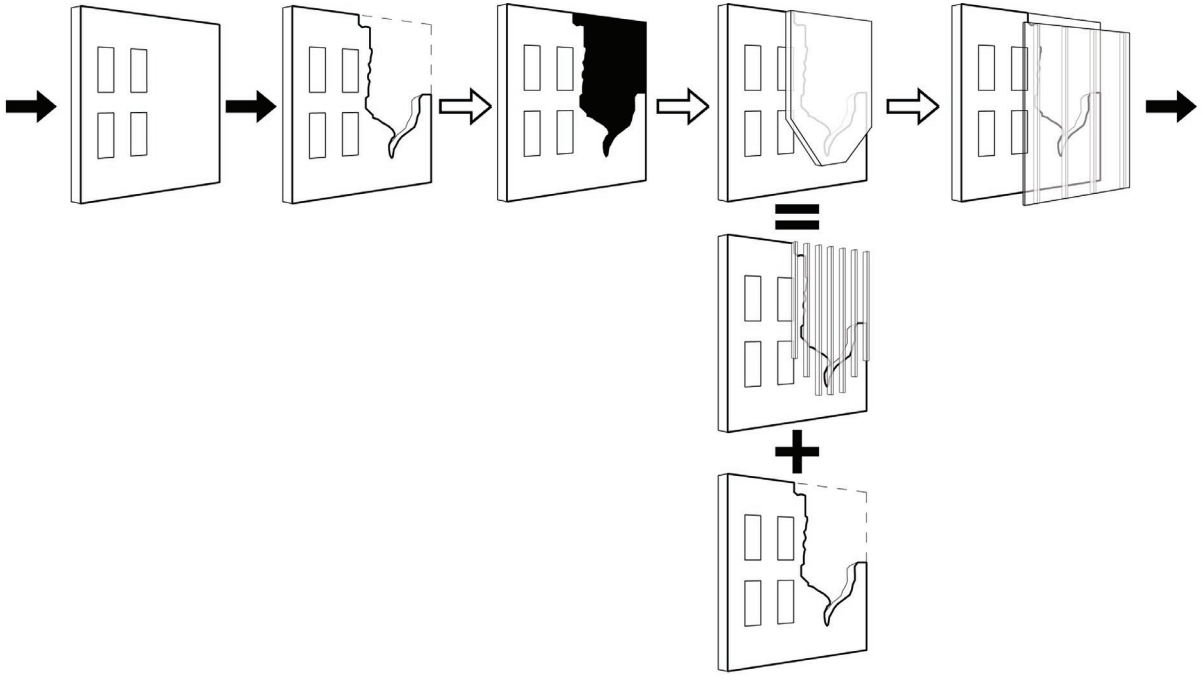


figure 3.0

rehabilitation. New development typically displaces patrons of the neighborhood due to higher living and operating costs. Demolition, most importantly, completely destroys the existing architectural and cultural fabric of the community. The architectural fabric represents the character and cognizable assets of a city. It is often what individuals identify with when considering a neighborhood or community. By recycling much of the existing structure and formal qualities of the building, the community members are able to continue to recognize the artifacts to which they have grown accustomed.

My thesis utilizes the building skin as the primary tool for renovation. Recladding existing, run-down structures will allow them to regain their proper function, performance and aesthetic quality. Recladding, as a viable source for renovation, has the potential to create a series of beneficial outcomes. A reclad would be able to remedy many existing inadequacies of the building and its operations. It will maintain the existing architectural, cultural and historic fabric of the neighborhood. It will provide a renewed identity for the client. It will increase the performance, efficiency and aesthetic quality of the building.

03

Recladding Techniques & Strategies

This thesis research will explore recladding techniques and strategies that will be derived from a series of precedent analyses. Each of the analyzed precedents was reclad for a particular reason and have benefited from the process. Techniques and processes from the case studies will serve as a catalogue for the design process. To be able to analyze each precedent with a similar lens it was important to generate a list of criteria. The initial building skins research is based on four fundamental roles and the precedents and their reclads will employ the same criteria. Function, construction, form and ecology make up the specific areas of analysis that will frame each precedent.

The reclad possibilities are just as endless as the materials and strategies used across the world. It is important to understand why particular materials and strategies are used in particular building situations. The reclad could have been used to fill missing parts of walls, protect a historic façade from further deterioration or allow the owner to represent the building to the public to create more interest in the business it houses. In each of those scenarios, it would be inappropriate to construct an entirely new façade on a building that only desires specific considerations in discrete locations. Likewise, if an existing structure were representing a historically protected façade, it would be unlikely that the appropriate design solution would be to tear it down or construct new components in place.

Due to the numerous options available, specific strategies are needed to aid the design process. To classify the

precedents, I established five general recladding techniques. Each strategy represents a distinctly different approach. For the thesis project, the five strategies will be able to be applied to achieve the end result of a successful, highly performative and efficient building that utilizes much of the existing structure while providing a high level of aesthetic quality.

The first technique is the 'patch.' It represents the type of reclad that consists of filling missing or deteriorated components with materials similar or dissimilar to the existing materials. Removal and replacement of brick that has been damaged due to freeze-thaw or other elements is characteristic of the patch solution. It was best utilized in the precedent of Koldinghus Castle in Denmark. In that project, Inger & Johannes Exner turned a ruined castle into a functional, attractive museum. The project utilized infill walls and wood shingles, similar to the local vernacular, to repair the missing sections in the castle walls (see figure 3.1 for patch strategy diagram).

The second technique is the 'canopy,' which illustrates a form of protection by creating a physical barrier over an existing structure. Motives behind this method are to maintain an open-air experience while allowing use through the various seasons and weather conditions. Another use for this strategy is to protect what is underneath from further deterioration and decay. This technique was applied at the Santa Caterina Market in Barcelona. Architect Enric Miralles maintained an existing marketplace by providing a colorful, undulating roof as protection. It not only preserved the existing structure

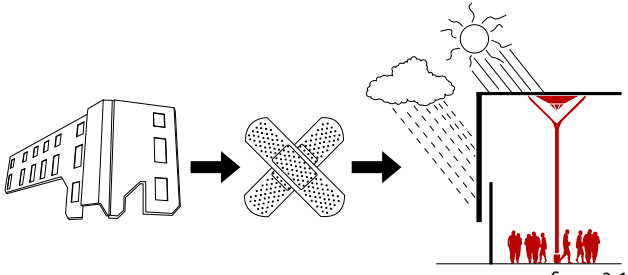


figure 3.1

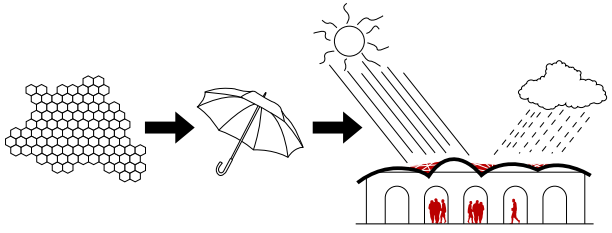


figure 3.2

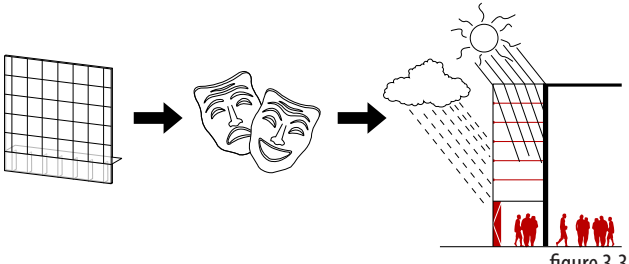


figure 3.3

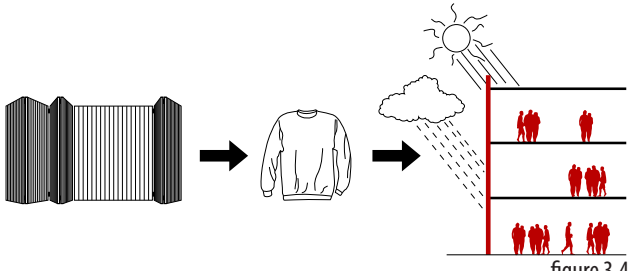


figure 3.4

from further deterioration, but also allowed the market to be used in any weather condition (see figure 3.2 for canopy strategy diagram).

The third technique is the 'layered skin,' which provides a second layer to the existing façade, protecting it from exposure to the environment. In some historical situations, it is more logical to construct a barrier in front of the existing structure rather than try to interact and renovate the often, brittle materials. The second skin technique was utilized in Catalana Music Palace, also in Barcelona. A separate, second façade preserved the historic, ornate façade. A glass curtain wall now protects the existing facade without being obtrusive in appearance (see figure 3.3 for layered skin strategy diagram).

The fourth technique is an entirely 'new skin,' which is utilized when a building façade has deteriorated beyond any possible use. It can also be applied when the client desires a completely new identity and the existing façade is not worth keeping because it has little cultural or historical importance. This technique is best illustrated in the Five Courtyards project in Munich. In that project, an interior shopping complex was given a new, bronze-mesh face to serve as the prominent entrance. Each of the four techniques of the reclad could be utilized in the recladding process (see figure 3.4 for new skin diagram).

The final, fifth strategy is to allow the existing building skin to remain. This strategy is used primarily as a comparison for the other four methods. The intent of developing the

distinctly different strategies is to later utilize them in the design project. After analyzing the existing conditions of the thesis site, the recladding strategies will be applied to determine the appropriate design solution. The limitations of this procedure revolve around the fact that every building is drastically different and experiences different conditions. While the established strategies will clearly aid the design, they are general techniques. Each reclad must be customized to the project site, building and unique conditions.

04 Case Study Analysis

Case Study Collection

The following selected projects implement a recladding strategy to successfully deliver their renovation. The architectural qualities and success through the reclad of each project has provided a wide array of materials and strategies that has directly influenced the design process.

As a first step, it is important to create an initial categorization of the chosen reclad precedents. To classify the numerous precedents, a matrix is developed. Within the matrix, specific categories allow a quick comparison along the considerations of scale, intent, method, materiality, economy, zoning and over-arching strategy. The categories enable a subdivision of the precedents into their appropriate categories, while understanding that many of the projects lie within many categories due to their program and recladding scale (see figure 4.0).

The precedent matrix is the first step toward the case study analysis. To further the investigation, individual projects are pulled from the list to analyze in greater depth. The deeper evaluation consists of using the four fundamental roles previously established. Within the function, construction, form and ecology, the precedents are better understood.[1] In essence, the case study analysis serves as a catalogue that is used to aid the design process. Materials, construction techniques and recladding strategies are directly related to the design project.

Further analysis is developed through documentation, both graphically and written. Drawings are created that explain the construction materials and techniques. Other

	Precedent | image, name, location, architect	Scale			Intent						Method				Materiality					Economics			Zoning			Image | strategy
		Small	Medium	Large	Repair	Renovation	Preservation	Revitalization	Energy Efficiency	Structure/Stabilize	Marketing/Aesthetics	Patch	Shelter	Second Skin	Complete Reclad	Glass	Metal	Timber	Masonry	Cheap	Moderate	Expensive	Industrial	Residential	Commercial	
1	 Koldinghus Castle Kolding, Denmark Inger & Johannes Exner		●		●		●			●		●						●	●	●						●	
2	 Five Courtyards Munich, Germany Herzog & de Meuron	●				●		●			●					●	●				●					●	
3	 Palau de la Musica Catalana Barcelona, Spain Oscar Tusquets			●			●		●					●		●						●				●	
4	 Apraksin Dvor St. Petersburg, Russia Wilkinson Eyre Architects		●				●	●					●			●	●					●				●	
5	 Superdome New Orleans, Louisiana Trahan Architects			●	●				●	●					●		●					●				●	
6	 1140 Avenue of the Americas New York, New York Iu & Bibliowicz Architects			●		●					●				●	●						●				●	
7	 Sibelius Hall Lahti, Finland Artto Palo Rossi Tikka Architects			●			●				●	●			●	●		●			●					●	
8	 Lightborne Communications Cincinnati, Ohio Jose Garcia & Terry Boling	●				●						●				●	●			●						●	
9	 SUVA Extension & Alteration Basel, Switzerland Herzog & de Meuron			●		●					●				●	●						●				●	
10	 375 Pearl Street New York, New York Cook & Fox			●		●			●		●				●	●						●				●	
11	 Kuppersmuhle Museum Duisburg, Germany Herzog & de Meuron	●			●	●	●				●	●				●			●		●					●	
12	 Mercat Santa Caterina Barcelona, Spain Enric Miralles		●				●	●					●			●	●	●			●					●	
13	 Fifth Third Parking Garage Cincinnati, Ohio Julian Stanczak	●						●			●			●			●			●						●	

diagrams are also developed that could aid in the explanation of the project as well as components of the façade. The critical questions that each comprehensive analysis attempts to answer are as follows:

> Why was it done? How were the initial choices made? Why was reclad completed in this style (i.e. patchwork as opposed to new skin)? What construction techniques were employed? How was it detailed? What materials were used and why were they chosen? What are the outcomes, both functionally and ecologically? How has the project performed on the criterion of environment, construction and economy? How did the reclad influence its surrounding context? How do you quantify historic representation/value? How did it impact the socio-culture? How did it impact the institution? Who is responsible for the reclad? Who were the beneficiaries of the project?

Through the answers to these critical questions, a strong base of information is established. The following sections correspond to the comprehensive analysis of select projects.

04

Koldinghus Castle

figure 4.1

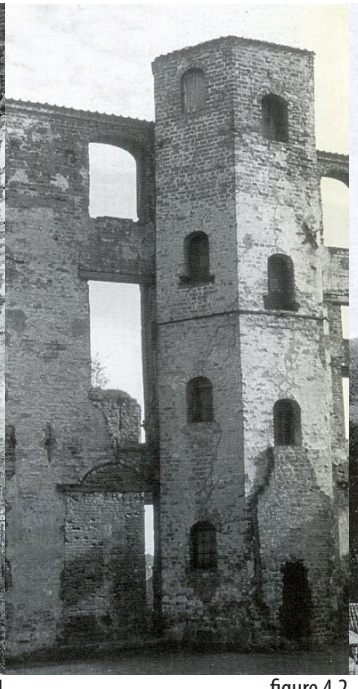


figure 4.2

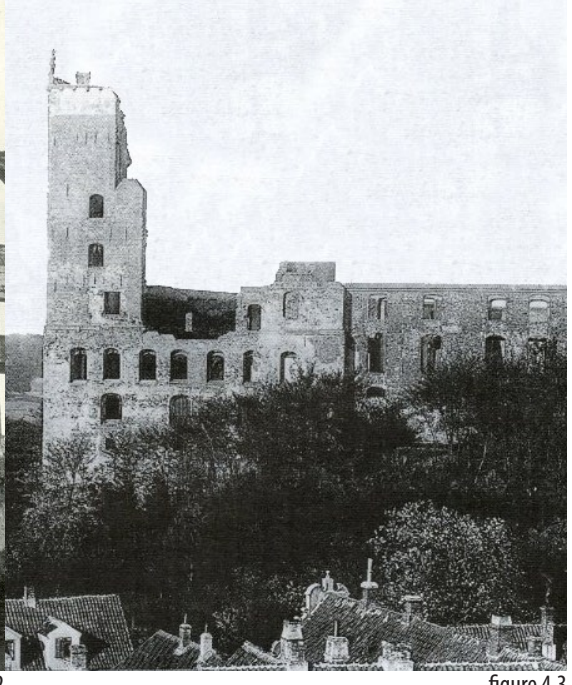


figure 4.3

Koldinghus Castle is the Jutland Peninsula's last royal castle. It "has played an important historic role over its 700-year existence."[2] Throughout its service, it has worn many different hats. It has served as a border defense, a royal residence, and as the meeting location for representatives of the Danish central government. Initially a Medieval Castle, it was transformed into Denmark's first Renaissance castle after King Christian III carried out extensive renovations. Koldinghus has also been home to King Christian IV and later to King Frederik IV, who transformed the castle into one of Baroque style. In March of 1808, during the Napoleonic Wars, a serious fire broke out in the castle. While there was no human loss in the fire, a large section of the Great Tower collapsed and crushed the castle chapel beneath. Koldinghus Castle was left as a charred ruin.

It wasn't until 1863 when the idea of rebuilding the castle was introduced by preservation activist, Hans Christian Andersen. While this did not lead to any direct activity, the conception of the museum founded in 1890 did reintroduce the concept of rebuilding. The committee behind the museum was able to act as a driving force behind the renovation. It wasn't, however, until 1970 when the full approval and schedule of renovation went into effect. Even then, however, it was unsure exactly how the project would be completed. The architect pairing of Inger and Johannes Exner were charged with the duty of providing the proper solution.[3]

When the architects took on the project, the walls of the castle had many large gaps. The roof of the castle was

figure 4.4

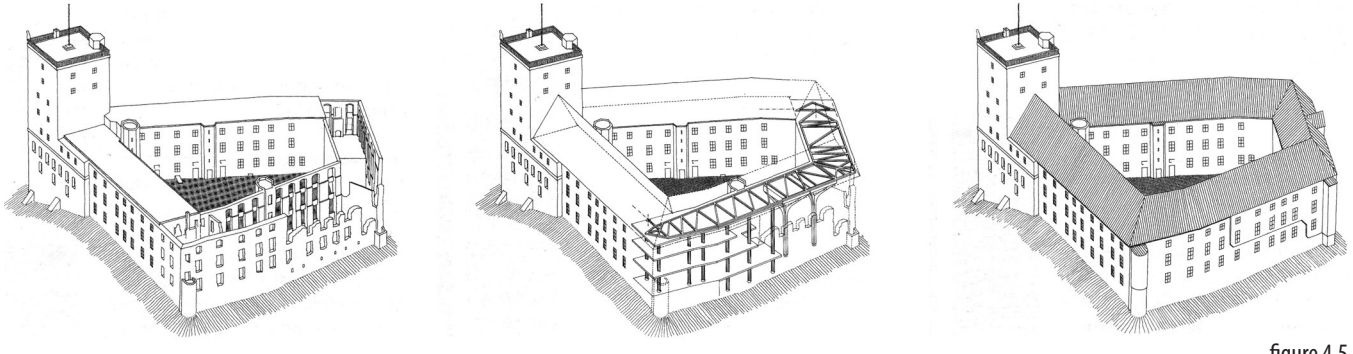


figure 4.5

in great disrepair, completely destroyed in some locations. Beyond the major deficiencies, there were many locations in which brick had been badly damaged or had been missing altogether. Due to the major inconsistencies in the wall and roof construction, the castle was rendered nearly functionless. The debate on whether the project should be left as a romantic ruin or be returned to active use, as a museum was very heated. In 1972, the Exners chose not "either ruins or rebuilding," but instead chose to have "both ruins and rebuilding."[4]

In deliberation about the proper solution for Koldinghus, four approaches were considered. The first was the value of the ruins as a romantic monument with emotional and imaginative impact. The second was reuse of the building. The third was protection of the ruins from further decay. The fourth was the possibility of reconstruction. The committee favored a practical renewal and repair, although any attempt to mask the existing conditions was rejected. They decided to "aim at a solution that makes preservation possible by encapsulating or enclosing the remaining brickwork in a newer construction that will serve some useful purpose."[5]

The final decision was to create a functional museum that would serve the people visiting the Jutland Peninsula. The building had to be adequate to house exhibits and expensive works. It was obvious that the castle must be able to keep out wind and rain as well as maintain the appropriate quality of interior air. To truly be successful, however, the castle

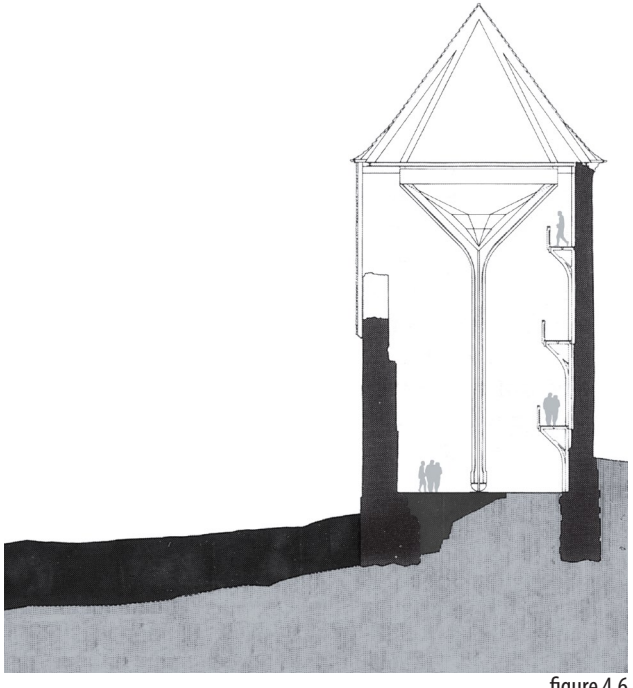


figure 4.6

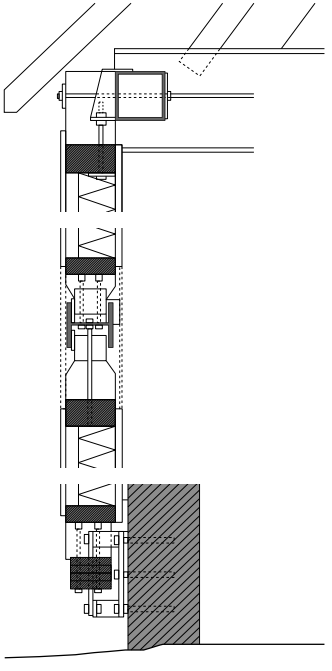


figure 4.7

had to be as close to hermetically sealed as possible. The new construction was meant to frame and emphasize the narrative value of the ruins. Through the development of the project, it became extremely important that the ruins and existing structural components were to be disturbed as little as possible. This allowed the ruins to stand out as one of the most distinguished elements alongside the other exhibits of the museum.

To be able to complete the planned restoration, locations in the south and east wings had to be given new foundations. After the foundations were stabilized, new wooden columns were erected. The pillars were constructed of laminated wood and are intricately designed. The columns are designed to support the vertical forces stemming from the newly constructed roof. The columns support the weight of the roof, mezzanine floors in the castle, and suspended walkways.

The exterior was reclad in the locations where the wall had been destroyed. To successfully protect the castle and its ruins from any further deterioration, light wood framing was placed in front of the missing sections of the wall. Smaller holes in the castle were patched with modern-sized bricks and repointed. The wood framing was suspended from the new roof construction. Both the roof and new sections of wall were clad with oak shingles, similar to the existing vernacular of Kolding, Denmark and the Jutland Peninsula.

The architectural appearance of the restoration is

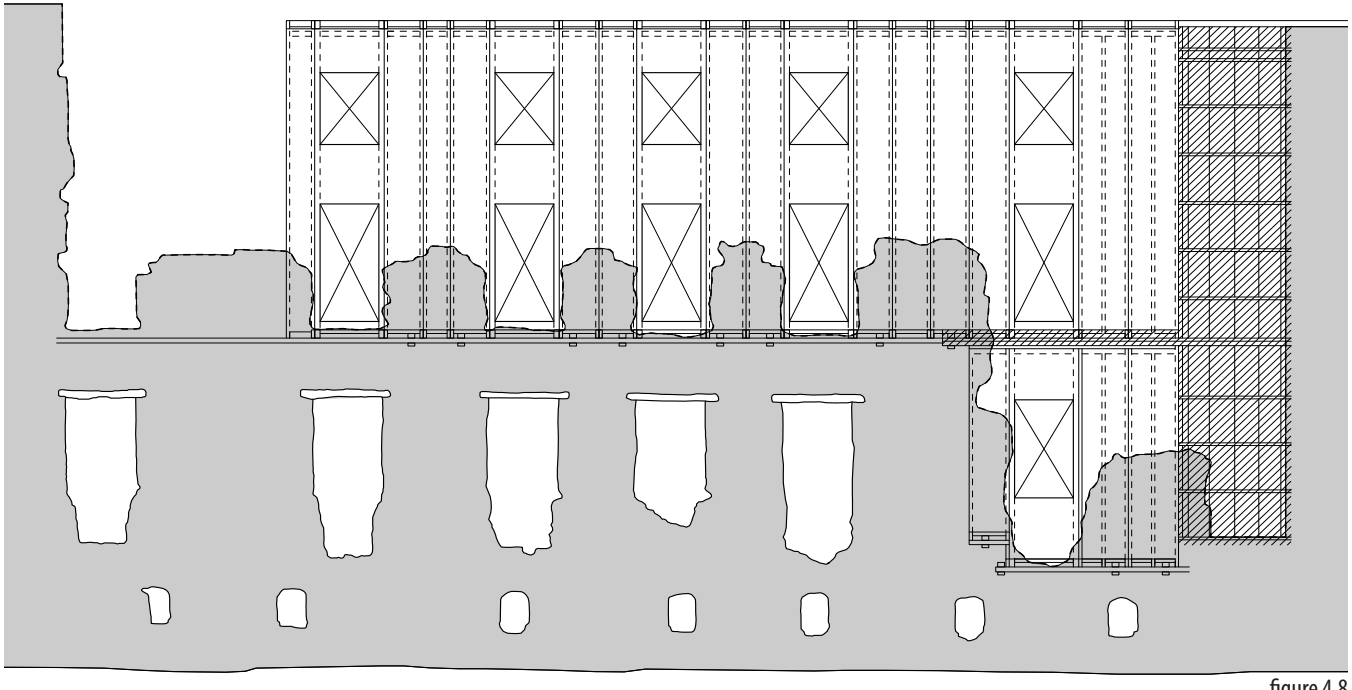


figure 4.8

distinctly different than the original structure. The architects chose different materials than those chosen by King Christian III and King Christian IV for their renovations of the castle. The interior utilizes laminated wood and steel to make the new construction possible. The exterior is a mixture of the previously mentioned oak shingles and brick. The new brick, however, is of modern size and shape. When reading the wall of the castle, the new brickwork is easily distinguished. The new wall components of the castle emphasize the traces of windows and doorways developed through the many renovations and additions of Koldinghus.

The energy consumption of the project and economic requirements were reasonable when considering the construction techniques and materials chosen. The architects were able to draw from strategies typically employed in the surrounding context. This allowed local craftsmen and materials to be utilized in the project. The energy consumed was similar to many construction projects of the region. When considering the operations of the castle/museum, the architects and craftsmen did a efficient job sealing the building so that heating and cooling loads are manageable.

When considering the outcome of the Koldinghus Restoration, I deem it a success. The architects were wise when they pulled from the surrounding context. This created strong, local support for the project instead of opposition, which was created, by the original project. The original plan

figure 4.9

was rejected when it was presented as encasing much of the building in a high-performance glazing system. The patch strategy was appropriately chosen due to the needs of the existing building. A layered or completely new skin would have exceeded the project budget and would have alienated the romantic relic the renovation was intended to protect. It would also not have been logical to demolish further parts of the castle when the concept established was to combine "both ruins and rebuilding"[6] in a way that disturbed the existing ruins and structural components the least.

04

Santa Caterina Market

figure 4.10

figure 4.11

The renovation of the Santa Caterina Market is intended to provide a safe, public space in one of the worst slums in Barcelona's Gothic Quarter. Within the urban context of the Avenue Cambó area, the project is located near a number of well-designed tourist attractions. The Picasso Museum and Ramblas are just a couple of the attractions that occupy the surrounding context. Due to its proximity with these other significant buildings, the project had an agenda that involved an end result that could serve as a strong identity and recognition for the commercial spaces and market it supports.

The Santa Caterina Market is a prominent structure to the surrounding urban environment. Each space within the market has direct access onto the bordering street and pedestrian way. The project began as a competition in April, 1997. Many of the entrants considered complete reconstruction of the market. Enric Miralles and Benedetta Tagliabue, however, won the commission when they presented their ideas of old and new. The architects believed that the project "must not merely exist in a moment in time, but must inhabit it."[7] The concept was to propose a scheme that blurred distinction between the rehabilitation and the new construction portions of the project. Supporting the idea of demolition as the only way to solve the problems of use is clearly a mistake. Miralles felt the key to the project's success was "using and using again."[8]

The renovation project was part of a larger revitalization. The program of the project remained primarily the same, with the addition of a housing a component in the rear of the market. For the sake of the precedent analysis, focus

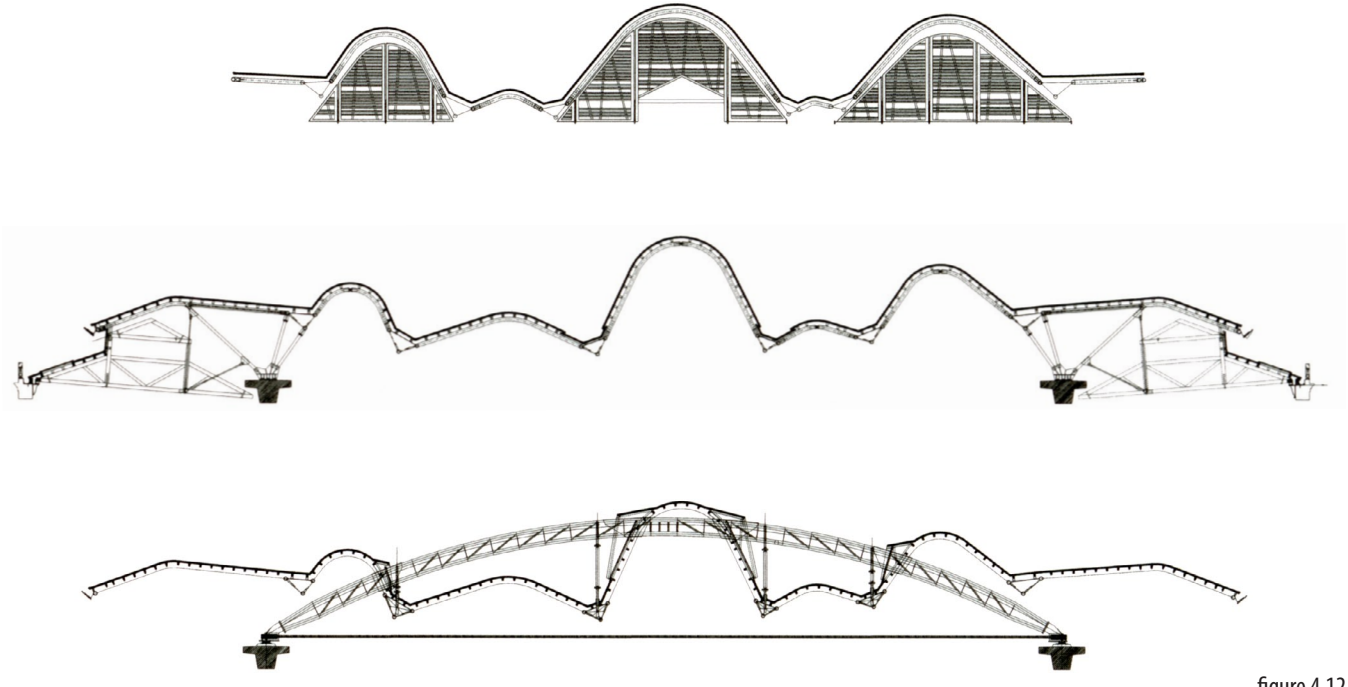


figure 4.12

will be given to the market renovation and not the new housing construction. The intent was to provide a market to be used under any weather conditions as well as through any seasonal changes Barcelona could offer. This intent led directly to the solution of a canopy. It permits an open-air experience that has high levels of interaction with the surrounding context.

Remaining true to the juxtapositions characteristic of the historic area, the architects preserved the facades of the original market, made of masonry walls.[9] To create the canopy over the market, the existing, load-bearing walls were utilized as support. White-painted masonry walls occupied three sides of the historic market and presented a strong opportunity for structure as they remained in good condition. The arched openings in the masonry allowed for easy passage in and out, as was a major concern for the design. Utilizing the structural walls, an intricate truss system was developed. The trusses span great distances and make up the major component of the project. From the steel and glue-laminated wood trusses, the roof is clad in ceramic tile that provides the market with the aesthetic quality that allows it to be considered an icon.

The interior of the market was renovated as well. Simple techniques of ground coverage allowed the designers to push their concept to the public realm. Granite pavers used on the surrounding city streets were brought into the space to explain that the market is a public place. The space houses sixty vendor's stalls. A variety of shops, cafes, markets, restaurants, and underground parking are also incorporated into the project. As a whole, the market revitalization cost 21 mil-

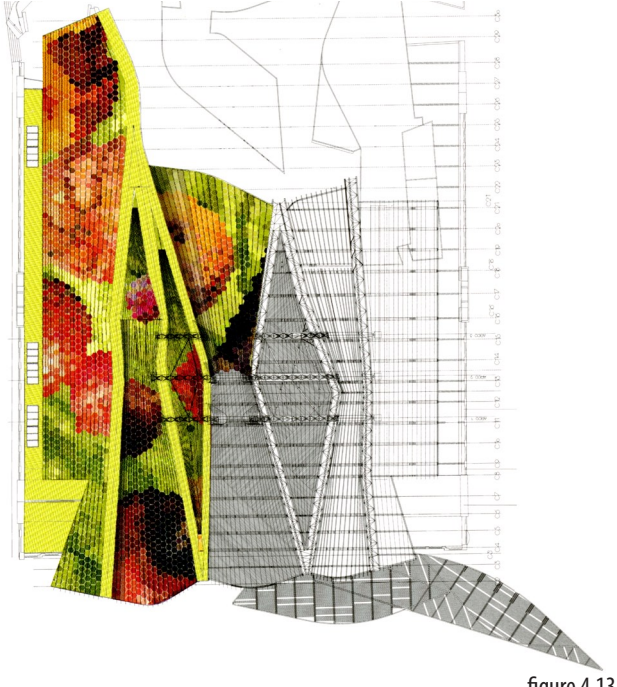


figure 4.13

figure 4.14

lion euro as part of the Ciutat Vella urban revitalization.

Formally, the Santa Caterina Market is dynamic. The roof is an undulating surface clad in colorful, hexagon tiles. The tessellations and lively pattern of colors is representative of the fruit and vegetables sold within the market below. As it is viewed from the street, the roof evokes dominant forms and rippling vaults that forms the edges of the surface. The 300,000 colorful, ceramic tiles allude to the energetic life of Barcelona.

The project utilizes the canopy strategy of reclad to achieve the project goals. Different routes could have been taken to create a well-operated market, but the canopy strategy was most appropriate. It was appropriate due to the desires of the client and existing urban context. The intent, as mentioned, was to maintain the open-air quality of the original market. A strong connection between the market and public realm beyond was desired for the project. The project is located within a historic district, yet the market did not offer much cultural significance to the area. The architects did a successful job in maintaining some of the structures, which allowed them to pour more resources into the very active roof system. I believe the aesthetic quality and material strategies used also achieved a great success.

Laying 300,000 ceramic tiles, although in groupings for manageability, is very demanding on the part of the craftsmen. It is, however, a very common practice in Barcelona due to their lack of drastic seasonal change. The

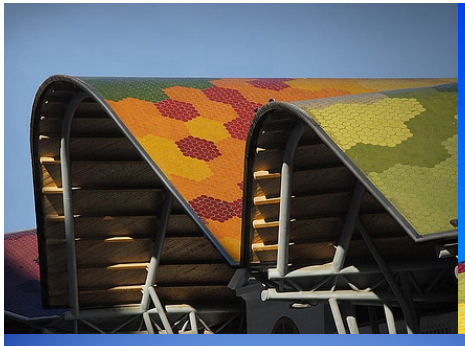


figure 4.15 / 4.17

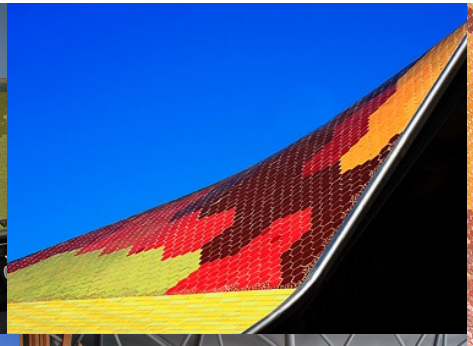


figure 4.16 / 4.18

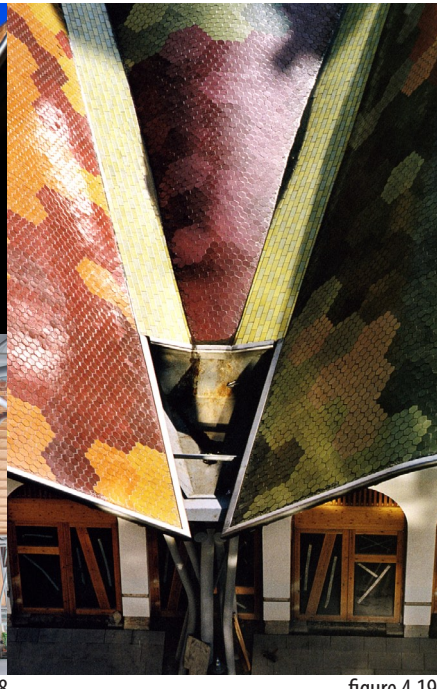


figure 4.19

tile is very durable and can withstand the weather that the Barcelonan climate can generate. It is also logical due to the program being a marketplace with high levels of interaction. It would not have made sense to create a pristine, glass box to be occupied by processes that are meant to be in open-air.

04

Catalonian Music Palace

figure 4.20

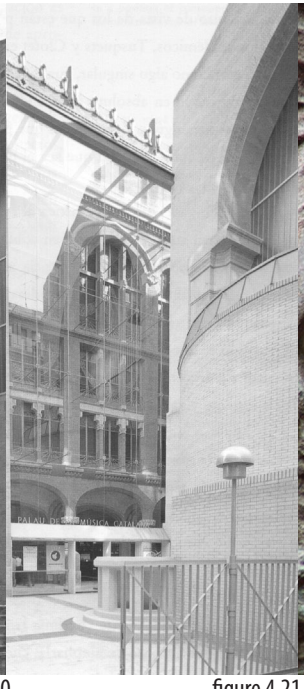


figure 4.21

figure 4.22

figure 4.23

The Catalonian Music Palace is a concert hall in Barcelona that was originally built in 1908. The concert hall is located in a very populated area known as La Ribera, a section of old and historic Barcelona. Surrounding by rather dull architecture, the Palau stands out as a rather intricately designed building. The original design by Lluís Doménech I Montaner was extremely rational by paying strict attention to function and making full use of materials and technologies. It utilized steel framing when it was built at the beginning of the 20th century. On the exterior, however, the Catalonian modernism instituted curves and dynamic shapes into the façade. It is characterized by floral and organic motifs. The exposed brick and iron, the detailed mosaics, fantastic stained glass, and glazed tiles were included to decorate the façade and provide a sense of openness and transparency.

The need for restoration of the concert hall became aparent in the 1980's. Between the excessive deterioration of the fabric, the unsympathetic subdivision of the original rooms, and the opportunity to expand the complex, the appropriate conditions and timing had arisen for restoration and remodeling.[10] The project was commissioned to architects Oscar Tusquets and Carlos Diaz. The work included many different agendas. An accurate restoration of the original Modernist façade had to be completed. This work was particularly difficult due to the vast amount of detail included in the facade of the Palace. Many interior modifications and upgrades had to be accomplished, such as improved services,

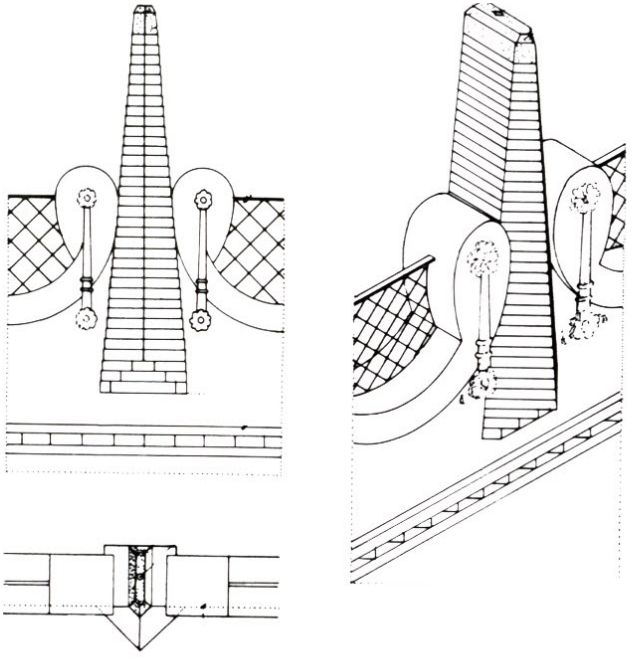


figure 4.24

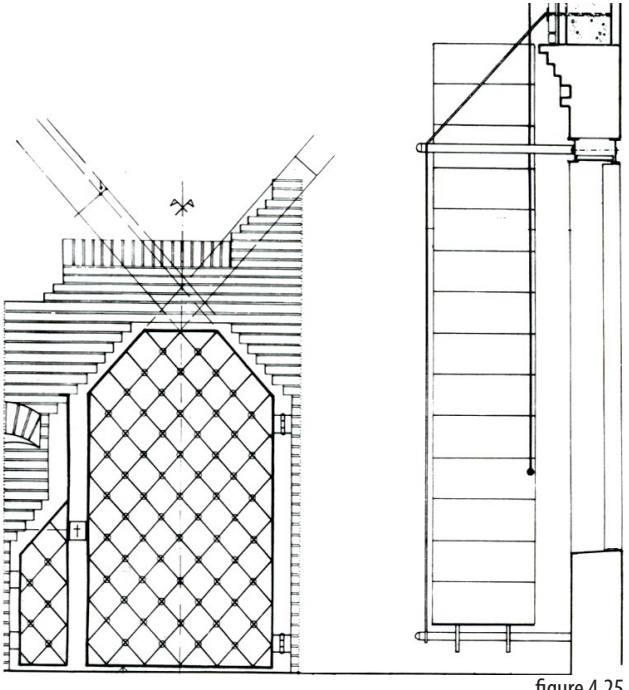


figure 4.25

security and climate control. Due to the increased demands of the concert hall, an expansion was intended. The design consisted of a new building for the auxiliary services adjacent to the original construction. Beyond the Palace work, a nearby church had been under renovation from the 1940's. The church renovation was to be completed and an attachment was to built to connect it, the Palace and the addition. It is clear that the project had a very large budget, but Tusquets was commissioned in part because of his ability to complete a project within budget.[11]

There was a strong push to restore as much of the existing facades as possible. While this was easily accomplished with some facades, other facades required heavy research and investigation on the part of the architect. Some of the simpler examples included reconstruction of entrance doors and pediment balustrades, while some of the more rigorous examples included rolling gates and lamps. The two primary facades that required restoration included the Calle Alt De Sant Pere façade and the Calle Sant Francesc de Paula façade. While the façade off of Sant Pere proved to have a simple solution, the Sant Francesc façade required much more innovation.[12]

The Sant Francesc façade was found to be in far greater disrepair than originally thought. Restoring this façade to its original condition would have been extremely costly, potentially exceeding the budget provided. Fearing uncertain

figure 4.26

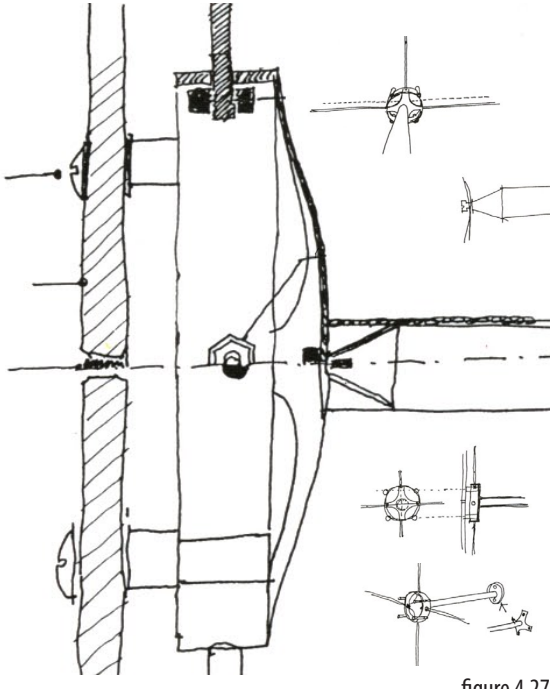


figure 4.27

results from the restoration as well as having limited space between the façade and adjacent church, it seemed logical to demolish the colonnade of the portico. Tusquets & Diaz, however, found ways to reuse the stone elements of the façade. The façade was then restored with modern brick, creating a clear distinction between the existing and new construction.

The most informing façade restoration with regard to the recladding process and this thesis was one directly off the patio. Through the combination of a glass curtain wall and skylights above, the patio was enclosed to accomplish a number of goals. The layered skin protects the intricate and detailed façade behind, allowing the historic and architectural character to continue to reveal itself to the public. It also creates a full-height vestibule that mediates between the interior and exterior climates more efficiently as well as admits plenty of natural light for the spaces. The double-glazing system separated the existing concert hall from the outdoors.

The project offered little opportunity for a façade solution when considering the facade adjacent to the patio. Demolishing the existing façade was not a possibility, as the concept of the project was to restore as much of the existing as possible. Local, more detailed solutions would not have worked either, as it would not have been able to prevent further deterioration of the historic façade. The architect appropriately chose the layered skin strategy. It was able to

figure 4.28 / 4.32

figure 4.29 / 4.33

figure 4.30 / 4.34

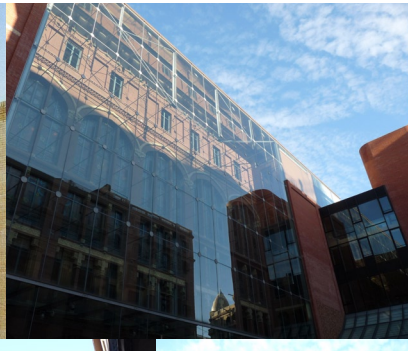


figure 4.31 / 4.35

achieve the goal of protecting the existing, while not creating a distraction from its fabric. Because of the restoration, the concert hall was able to experience much higher efficiency due to the high performance glazing system as well as the restored brick façade off of Sant Francesc. Also, adding the layered skin allowed the design to get closer to the concept of the hall's original architect. Lluís Doménech I Montaner desired that the Palace be a glass concert hall in which natural light would reach the audience with the same clarity as the music. This "delicate intervention,"[13] was successful and has allowed the Catalonian Music Palace to continue serving its primary purpose to the public without fear of an inability to accommodate their needs.

04

Five Courtyards

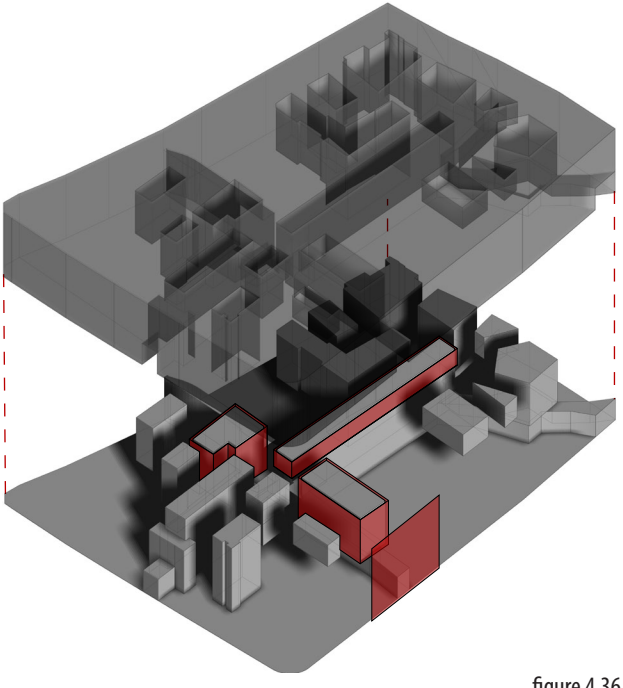


figure 4.36

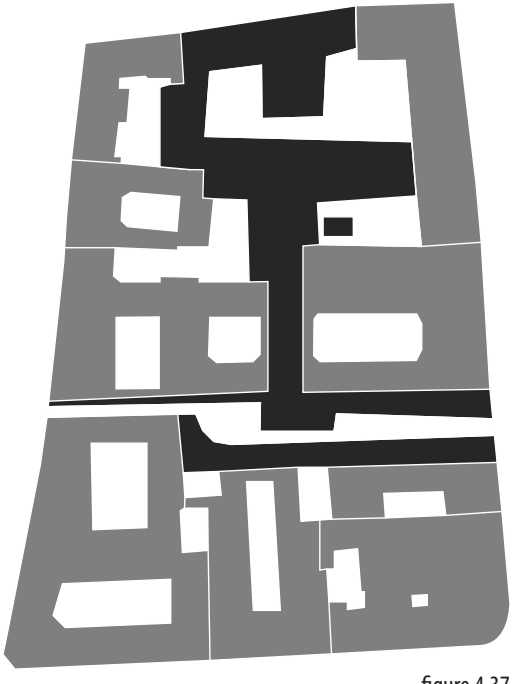


figure 4.37

Fünf Höfe, commonly known as Five Courtyards, is located directly in the historic district of Munich, Germany. The project, completed by Herzog & de Meuron, is adjacent to the central square of Marienplatz, which is characterized by heavy pedestrian activity, bustling stores, and lively restaurants. Five Courtyards began as an architectural competition, funded by the owners of HYPO-Bank and Vereinsbank. The intent of the project was to create the European equivalent to the American mall. Instead of being detached from surroundings like the American mall model, this project is intended to "establish a model that would restore the real – bring in the sky, the ground, and a realm of sensory experience."[14] The end result was intended to provide Munich, a city smitten with its past, with an upscale, luxurious shopping complex.

The project scope was an entire city block. The original project statement called for the demolition of all post-war buildings. Political opposition to the demolition, coupled with financial constraints, put the project on hold until 1998 and drastically changed the concept of the design.[15] Architects Herzog & de Meuron adapted quickly to the new program after the project resumed. The new program only allowed for the redesign of one façade. The façade that could be redesigned was adjacent to Theatinerstrasse, a heavily traveled pedestrian way. The rest of the 1950's facades were to remain as well as all of the 1895 and 1910 structure. Due to the limited exterior design work, it directed much of the focus to the interior, where only 35% of the existing could be demolished. Herzog & de Meuron approached the project with the intent of creating

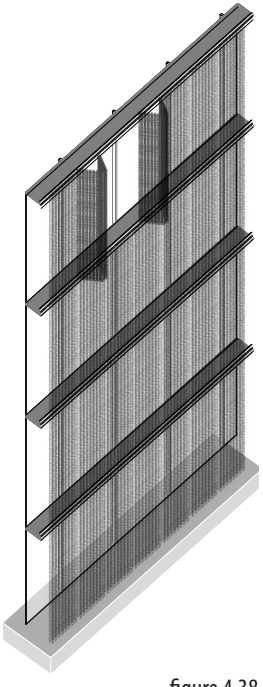


figure 4.38

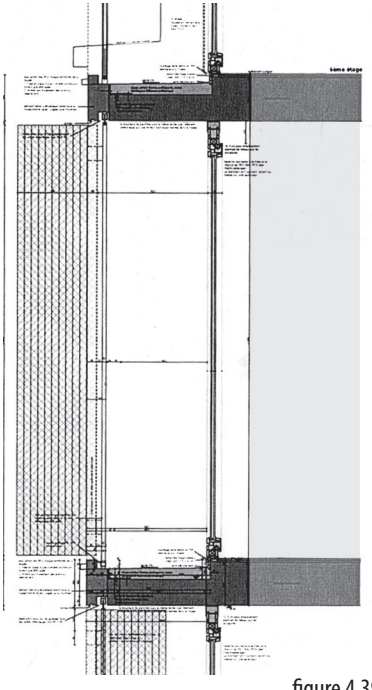


figure 4.39

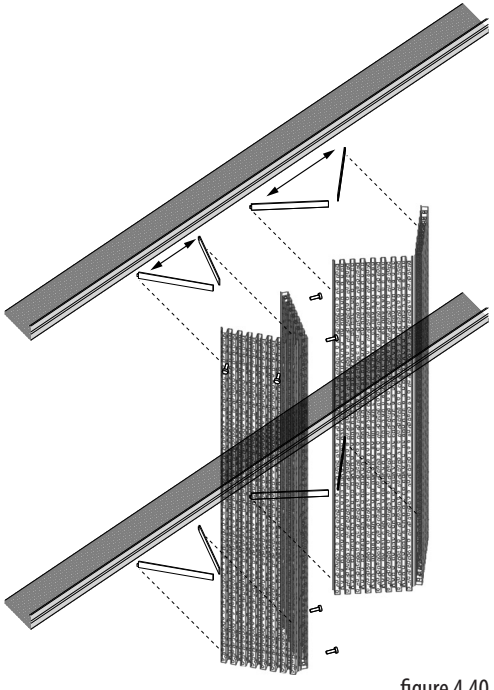


figure 4.40

an inner network of courtyards and passages.

The façade that was given a new skin is of most importance. The new façade was designed with limited materials in mind, but intended to create a strong impact. The result is an industrial-looking façade with a high-performance glazing system fronted with metal shutters. The existing, deteriorated masonry was removed, leaving only the historic structure. This structure was properly utilized to support the new system Herzog & de Meuron thought would invite activity within the Five Courtyards project.

The new glazing system consisted of G-30, straight sided glass. It was attached between floor plates with a structural grate system extending from the end of each slab. The glazing system creates the primary barrier between the built and urban. Attached to the structural grate system, an intricate, operable shutter system was installed to provide shade from the unforgiving sun. The material chosen was bronze, perforated mesh. The mesh provides a g-value of .12 when the shutters are closed and a value of .52 when open. The entire system, glazing and operable shutters, achieves a k-value of approximately 1.2.

When considering why Herzog & de Meuron chose the reclad for the single façade, it is clear they were trying to achieve a successful marketing tool. The stores and restaurants on the interior are accented through the use of different, detailed materials. The intense interior renovation,

figure 4.41

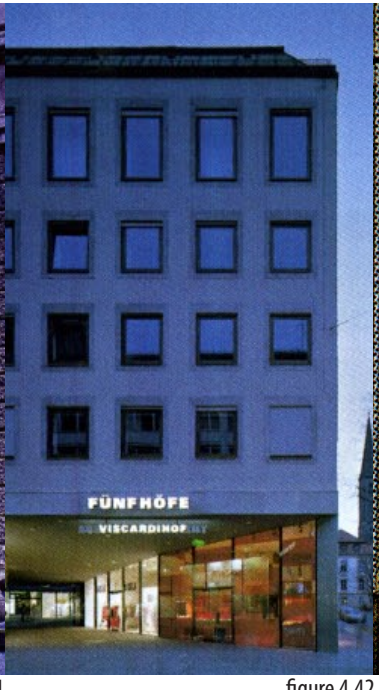


figure 4.42

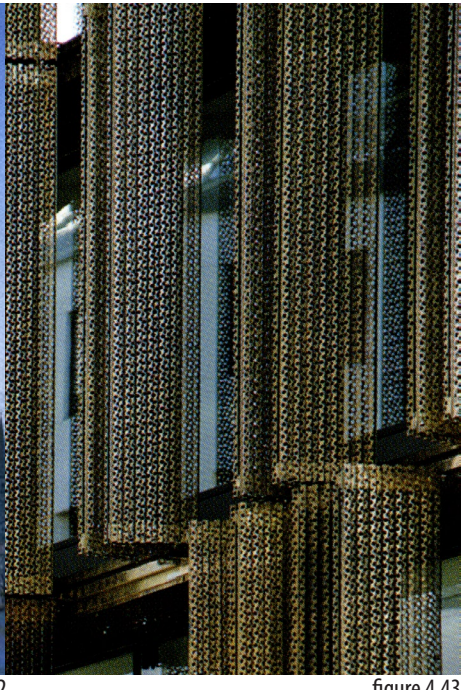


figure 4.43

however, is often overlooked due to the demure facades on the other surfaces. While the other entrance facades were restored to their original condition, they do not attract the same interest as the façade off of Theatinerstrasse. It was, however, important to place an architectural exclamation point at the Theatinerstrasse entrance.

The bronze, perforated mesh was not taken from the existing architecture of Munich. It does, however, create a very successful entrance to the Five Courtyards project. The new skin strategy was chosen primarily for marketing and aesthetic reasons. The original façade, although somewhat deteriorated, could have been restored to an efficient state. It is acceptable, however, that the façade strategy be chosen for reasons beyond performance and efficiency. The image and identity of a building can offer much more than a high r-value to its occupants. In this design, it offers both.[16]

Endnotes

[1] Christian Schittich, ed., In Detail: Building Skins: Concepts, Layers, Materials (Boston: Birkhauser, 2001), 29.
[2] Poul Dedenroth-Schou, "The Koldinghus Restoration," Living Architecture 9 (1990): 84.
[3] Poul Dedenroth-Schou, "History of Koldinghus," Koldinghus, http://www.koldinghus.dk/Default.aspx?ID=2398.
[4] Henry Miles, "Born Again Christians," Architectural Review 193 (1993): 64.
[5] Johannes Exner, "Koldinghus: The conversion of an Old Royal Danish Castle," Momentum 27 (1994): 285-300.
[6] Henry Miles, "Born Again Christians," Architectural Review 193 (1993): 64.
[7] "Rehabilitation of Santa Caterina Market," A+U 416 (2005): 90.
[8] Ibid, 88-99.
[9] Demborah Ascher Barnstone, "Raising the Roof in Barceona," Azure 21

figure 4.44 / 4.47

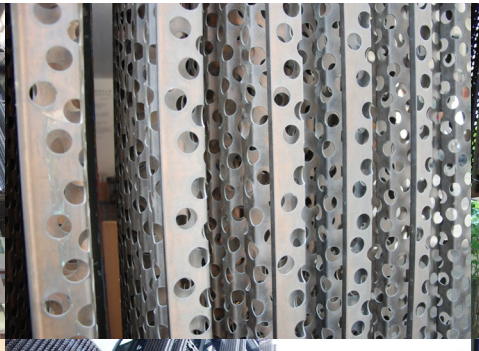


figure 4.45 / 4.48

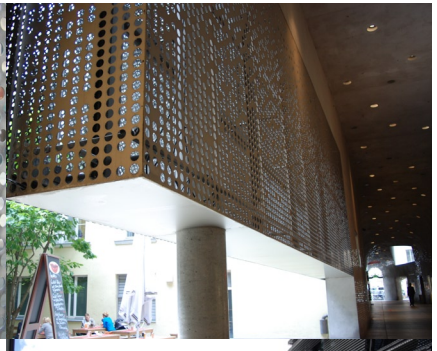


figure 4.46 / 4.49

(2005): 32.
[10] "Palau de la Musica Catalana," Architectural Review 189 (1991): 36.
[11] "Ampliació, remodelació I restauració del Palau de la Música Catalana, Barcelona," Zodiac 19 (1998): 146.
[12] Ibid, 147.
[13] Francois Burckhardt, "An Invisible Intervention: The Restructuring of the Palau de la Musica by Oscar Tusquets and Carlos Diaz," Lotus International 72 (1992): 25.
[14] Sarah Amelar, "Herzog & de Meuron transform a Munich city block, turning tradition street facades into a mask for Fünf Höfe's inner realm," Architectural Record 191 (2003): 103.
[15] "Five Courtyard in Munich," Detail 41 (2001): 393.
[16] "Five Courtyard for the Munich City Centre," A + U 5 (2005): 70-87.

05 1117-1127 Vine Street

Neighborhood Context

The site chosen for the thesis project is in Over the Rhine, a neighborhood in Cincinnati that is experiencing less than optimal development (see figures 5.0 & 5.1 for context information). Over the Rhine has been victimized in two ways that have resulted in destruction of historic fabric. The first is a direct result of neglect. Buildings were sealed and boarded up; they were vandalized, inhabited by squatters, or left open to the elements. The second comes under the guise of non-profit organizations intending to improve the community conditions through rebuilding. The neighborhood is prime for complete revitalization, often resulting in demolition (see figures 5.2-5.5 for graphic statistics).[1]

Over the Rhine is a National and Local Register historic district. Originally serving as a gateway for German immigrants in the nineteenth century, it has recently suffered from disinvestment and neglect. As greater Cincinnati suburbanized, Over the Rhine escaped much of the widespread demolition that was occurring in other highly urban neighborhoods. Even though it is recognized as one of the largest National Register historic districts, it is experiencing a steady loss in buildings due to demolition, thereby eliminating the neighborhood's unique character. As a direct result of the above, the National Trust had recently named Over the Rhine one of the eleven most endangered places in America.

When Over the Rhine was first developed, land values were extremely high. This resulted in land parcels that are divided into 25-foot wide by 100-foot deep lots. Early developers and investors packed buildings onto these narrow

figure 5.0

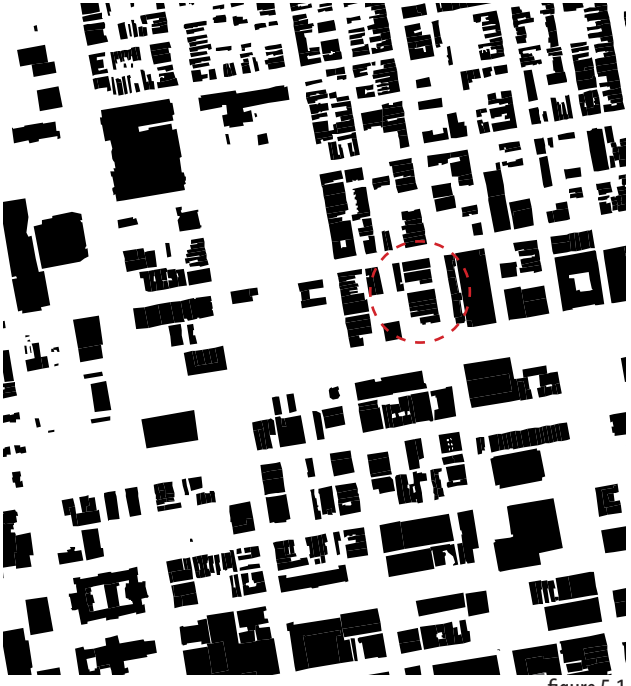


figure 5.1

lots.[2] The high demand for this land produced a density not found in the United States outside of New York City. In 1900, Over the Rhine had reached a density of 32,000 people per square mile, second only to Manhattan in American population density.[3] A vast array of architectural styles characterized the Over the Rhine neighborhood. Construction was of varying heights, uses and styles, such as Greek Revival, Romanesque, Queen Anne, and a simple form of vernacular.[4]

Over the Rhine offers many historic, Italianate buildings. Three to five story tenement buildings continue to line the streets with many other programmatic elements interspersed. Due to the severe deterioration in the neighborhood, it is evident that some form of rehabilitation must be undertaken. As opposed to demolition and redevelopment, renovation is the more advisable course. Arthur Frommer, an esteemed travel writer had this to say about Over the Rhine from a visit in 1993, a time when extensive deterioration was evident:

> In all of America, there is no more promising an urban area for revitalization than your own Over-the-Rhine. When I look at that remarkably untouched, expansive section of architecturally uniform structures, unmarred by clashing modern structures, I see in my mind the possibility for a revived district that literally could rival similar prosperous and heavily visited areas.[5]

Although Over the Rhine has been abandoned both economically and aesthetically, there are existing patrons who have made

Razed Historic Building in OTR 2001-2006

Razed Building

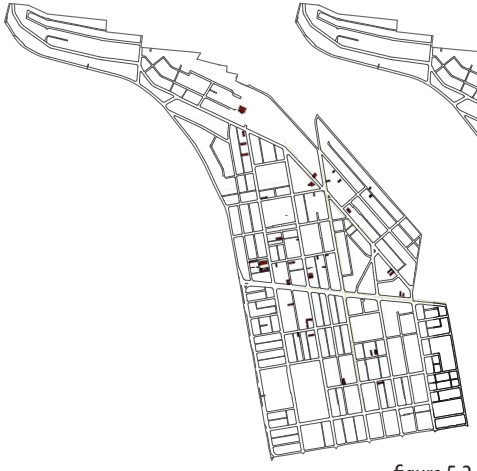


figure 5.2

Lost Historic Fabric Since 1930

Demolished Building

figure 5.3

Vacant & Condemned Buildings in OTR

Ordered Vacant Building

Condemned Building

figure 5.4

At Risk Historic Buildings in OTR

Level 1 Risk

Level 2 Risk

Level 3 Risk

figure 5.5

their place in the community and are devoted to solving its plight.

With regard to the climatic data that characterizes the city of Cincinnati, it can be related to Lechner's climate region of Indianapolis, Indiana. The region clearly encompasses Cincinnati, Ohio. The climate of this region, noted as region 3 by Lechner, is considered to be moderate. Averages snowfalls per year is between 12 & 60 inches. The sun shines more than 40% of the daylight hours in the winter, providing some opportunity for solar gains. In the summer, days are often marked with high humidity. This typically requires substantial cooling loads, also due in part to the high temperatures. To help manage the cooling loads, winds can be utilized for cross ventilation as well as generic cooling. Climate region 3 has an annual precipitation of about 39 inches. Precipitation is dispersed uniformly throughout the year. The climate design priorities, as outlined by Lechner, related directly to the characteristics of the climate. It is important to keep heat in and cold temperatures out in the winter, as is important in any moderate climate. It is important to protect from the winter winds, yet let the sun into the space. Letting the sun in can aid heating and provide a good level of comfort for the occupant. Along the same lines of keeping cold out in the winter, it is integral to keep hot temperatures out during the summer month. Protect from the summer sun and use natural ventilation for cooling. As a breakdown by climate, comfortable periods make up 14% of the year, days that are considered too hot make up 20% of the year, and days that are considered

figure 5.6

too cold make up 66% of the year. In climate region 3, the average amount of daylight hours is roughly 55%. Heating degree-days total 5,650 and cooling degree-days total 988.[6] The thesis site on Vine Street is subject to the aforementioned conditions (see figure 5.6 for site photo).

05

Ensemble Theatre of Cincinnati

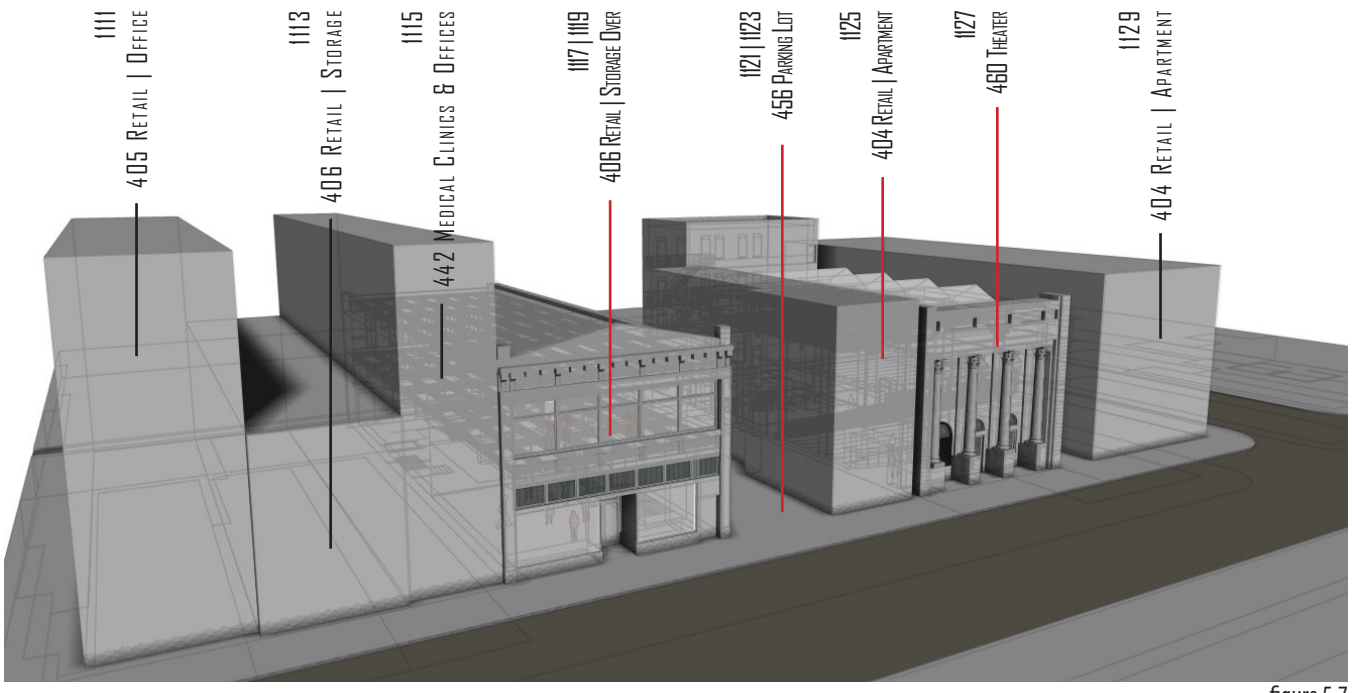


figure 5.7

The Ensemble Theatre of Cincinnati, located at 1117-1127 Vine Street is an institution dedicated to the revival of Over the Rhine. It is the owner of the site chosen for this thesis project. The ETC continues to exhibit strong dedication to the Over the Rhine district. Through its own renovation, it intends to help the revitalization process of the neighborhood at large. The theatre complex has been located in its current location on Vine Street for nearly twenty years and the ETC intends to remain at the same location. With the Ensemble Theatre's well-regarded reputation, it have gained momentum with their renovation project and plan to add to their complex, allowing them to continue to bring new artistic works to Cincinnati as they have done for the past twenty years.[7]

Before there was outside involvement in the revitalization in Over the Rhine, "the ETC was there bringing in money and visitors to the neighborhood."[8] For 24 years, the Ensemble Theatre has been improving its current home on Vine Street. 1127 Vine has been home to a number of building uses, such as a consulate, bank and printing shop (see figure 5.7 for current building uses). The 191-seat theatre is at another important point of renovation. The $6.5 million capital campaign is intended to help expand the presence of the theatre as well as improve the operations of the complex.[9]

The next stage of development is intended to embrace the ETC's mission of creating and bringing to Cincinnati world and regional premieres as well as allow for the important artistic growth of the professional team and visiting artists. The Theatre has experienced significant growth over the

past years. Over the past two theatre seasons alone, ticket sales have increased 22 percent. The ETC also has more subscribers now than ever. Interestingly, Producing Artistic Director D. Lynn Meyers noted that the ETC brings in some 35,000 patrons into the Over the Rhine neighborhood and makes an economic impact of more than $3.5 million in direct spending.[10] As stated by Brian Tiffany, Over the Rhine Chamber of Commerce President, "For several years, Ensemble Theatre of Cincinnati has made a huge commitment to stay in our neighborhood based on their confidence in the revitalization of our urban core. The ETC has once again proven that Over the Rhine continues to offer our city and this region one of the best examples of ensemble theatre in the heart of arts and culture in Cincinnati."[11]

Collaboration with management at the Ensemble Theatre will provide this thesis project with validity. The ETC has a strong presence on Vine Street, owning half of the 1100-block. While there are many buildings in Over the Rhine that would benefit from a renovation through the building skin, 1117-1127 Vine Street will serve as the prototype. The ETC's desire to create a much stronger presence and more efficient theatre complex directly correlates with the goals of the thesis project.

05

Building Conditions Assessment

A driving force for the reclad is the deteriorating material of the existing buildings. As mentioned previously, these deteriorating buildings that the thesis targets are often unable to accommodate their modern needs and users. They are characterized by having poor performance and efficiency as well as a low level of aesthetic quality (see figure 5.8 for deteriorations). To fully understand the needs for the chosen thesis site, 1117-1127 Vine Street, a building conditions assessment had to be completed.

The building conditions assessment is intended to evaluate the maintenance condition and serviceability of operating real estate. Building conditions assessments are typically utilized to assess the current conditions and to understand the scope of renovation and resources that will be required to return the structure to the intended condition. These assessments often include visual inspections of the building, written and photographic documentation of each component of the building, review of general documentation, cursory review of drawings of the building and site, as well as interviews and discussion with on-site personnel. They are in accordance with ASTM standards so that a similar level of detail and investigation can be conducted throughout many buildings.[12]

For the properties of 1117-1127, I have developed a set of criteria that the assessment intends to investigate. Each of the buildings under the assessment should include the following:

1. A general overview of the existing conditions

figure 5.8

2. Document exterior and interior of the facade
3. Identify the structure of the wall (load-bearing, curtain wall, etc.)
4. Analyze individual components of façade (foundation, brick, cornice, etc.)
5. Detail how façade terminates (ground, sky, turn the corner)
6. Assess each opening in the façade (doors & windows)
7. Make note of any deterioration or decay in façade (document with sketches & photos)
8. Evaluate and suggest recommendations of each decrepit condition

Through this investigation, the design process will be aided. The particular areas of deficiency will be considered and resolved in the recladding solution.

Endnotes

[1] Daniel Klingler, "Preserving the Queen (City's) Crown Jewel: Historic Preservation in Cincinnati's Over-the-Rhine" (Master's Thesis, MIT, 2006), 19-27.
[2] Jeff Raser, Architect, Glaserworks, Interview by Daniel Klingler, April 2006.
[3] Steve Gordon, Survey/National Register, Ohio Historical Society, Interview by Daniel Klingler, April 2006.
[4] Historic Conservation Office, Over the Rhine (South) Historic District Designation Report.
[5] Cincinnati City Planning Department, "Over the Rhine: A Description and History – Historic District Conservation Guidelines," 1995.
[6] Norbert Lechner, Heating, Cooling, Lighting: Design Methods for Architects, 2nd Edition (New York: Wiley, 2001) 86-87.
[7] "History." Ensemble Theatre of Cincinnati. http://www.cincyetc.com/aboutus/default.asp?p=2.
[8] "Ensemble Theatre an Over-the-Rhine Staple for 24 Years," UrbanCincy.

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[9] Ibid.
[10] D. Lynn Meyers, Interviewed by UrbanCincy.com, "Ensemble Theatre an Over-the-Rhine Staple for 24 Years," UrbanCincy.com, http://www.urbancincy.com/2010/03/ensemble-theatre-over-rhine-staple-for.html.
[11] Brian Tiffany, Interviewed by UrbanCincy.com, "Ensemble Theatre an Over-the-Rhine Staple for 24 Years," UrbanCincy.com, http://www.urbancincy.com/2010/03/ensemble-theatre-over-rhine-staple-for.html.
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06 Program Analysis

Existing Program

The existing programmatic conditions of the Ensemble Theatre do not meet the needs of the institution. The conditions of the theatre complex are inadequate due to lack of proper space, missing adjacencies and poor performance and efficiency (see figures 6.0-6.3 for existing plans). The overall complex does not provide the ETC with a presence on the 1100 block as well as Over the Rhine at large. The three-building complex is not unified. This thesis project intends to achieve a number of goals that revolve around a primary theme: provide a high-performing, efficient theatre complex through renovation using the building skin as the primary tool. This will be achieved by creating a design that has a strong presence within the community, a strong brand that the ETC can utilize to their benefit, and a unified complex for performance and operational reasons.

Currently, the theatre and lobby are located in the 1127 building. This building also houses many of the production facilities, administrative services, storage, rehearsal space, costume rooms and make-up rooms. Because the lobby is located in close proximity to the street and because the theatre is located in the main section of the building, it leaves very little space for the rest of the required program. The adjacent building, 1125 Vine, is completely under utilized because of its inability to accommodate operations due to limited space and floor coordination with 1127. In its current state, employees at the ETC are able to use the bottom floor, originally a bar. Access into 1125 is through the party wall

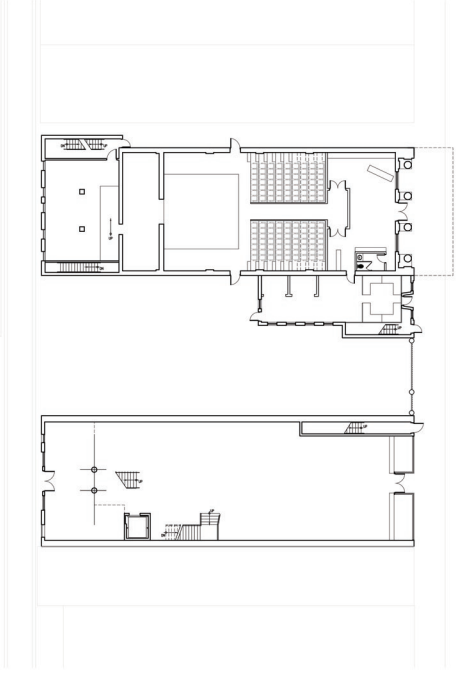


figure 6.0

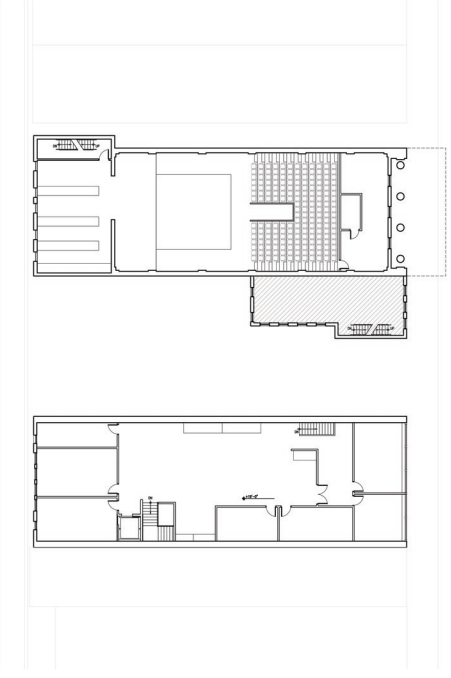


figure 6.1

it shares with 1127. The upper two floors of the building, formerly apartments, are unoccupied due to the large change in floor heights as compared to 1127. A vacant lot occupies the properties adjacent to 1125. The original intent of this space was to serve as an infill building. This lot serves as parking for the workers at the Ensemble Theatre. Last, the property of 1117-1119 Vine, formerly a department store, is used only for scene and set building. The second floor of this building is not being used, although it offers great opportunity due to its clear span space.

The inadequate program of the Ensemble Theatre is a driving factor for the reorganization of the complex. The following list of inadequacies outline many of the issues that will be resolved through the renovation project:

1. The current lobby is small, consisting of only 420 square feet. The desired amount for a theatre that accommodates 191 seats is nearly 2,000 square feet. The more generous the lobby space, the more flexible the ETC can be.

2. There is no formal box office for the public. Current ways of purchasing tickets are either online or telephoned orders that can be picked up immediately before the show.

3. There is no concession space for the Theatre. This is a missed opportunity to generate more revenue due

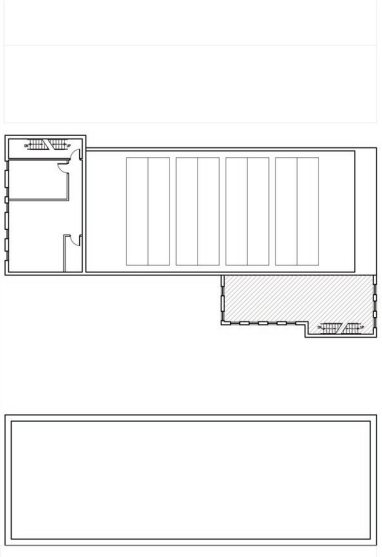


figure 6.2

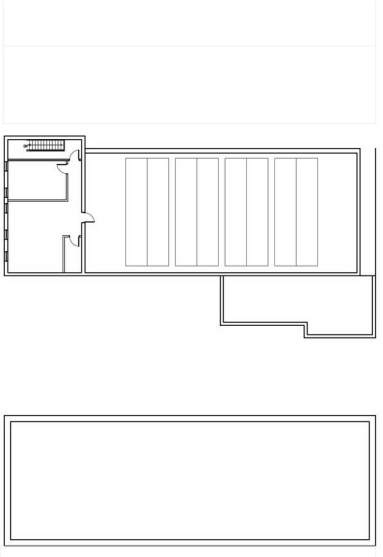


figure 6.3

to lack of space.

4. The entry for the ETC requires special access. The intent is to create a secure entry without having to barricade from the neighborhood.

5. The complex has poor circulation tied to the fact that the complex has not been unified but instead is used in its segmented form. The only elevator access to upper floors is through 1117-1119 and does not connect with the other buildings.

6. Although the theatre is properly sized, the rake is too steep and not accessible for the handicapped. The seating needs to achieve a lower slope.

7. There is no proper rehearsal and preparation space. Ideally, the complex would house an equally sized space for preparation. It would allow the scene and set building to be able to prepare appropriately. Also, by providing an equally sized space, it would improve the overall operations and turnover for the Theatre. The current production time for a show offered by the ETC has three weeks of run-time, which requires three weeks of preparation. If a space were provided for proper rehearsal and scene preparation, it would allow the ETC to run each show for four weeks as opposed to three. The turnover of four weeks would allow the company to generate better revenues and add to their bottom line.

8. The complex does not accommodate for set movement through buildings. The current constraints for set maneuvering are standard door sizes. These door sizes constrain the ability of the set builders to build things actual size and move them into the theatre. In the redesign, large doors must be provided in direct proximity to the theatre.

9. Additional program that the ETC desires is some form of leasable space, whether it be a restaurant, café or bar

10. The ETC also desires to add a black box theatre within the complex

11. The entire complex must be brought up to code. This requires stairs and elevators to be added to the complex to create a better network of circulation. This will also allow the Theatre to achieve accessibility for its handicapped patrons

12. Current restroom facilities cannot accommodate the 191-capacity. The proper ratio of restroom fixtures to patrons is 1 fixture per 25 patrons

From a performative and efficiency standpoint, the current conditions are under par. As a driver for the overall project, the building skin is utilized as the primary tool for the renovation. It is responsible for a series of goals. To restate many of the tasks charged to the building skin, it must achieve the desired

goal of emulating a strong brand and identity for the Theatre. Beyond a high level of aesthetic quality, the building skin must achieve strong performance and efficiency. The idea of utilizing the building skin as the primary tool for renovation is intended to benefit the owners and community. It will allow the existing structures of 1117-1127 Vine Street to be maintained, saving the Ensemble Theatre a significant amount of resources.

06

Response to Program Needs

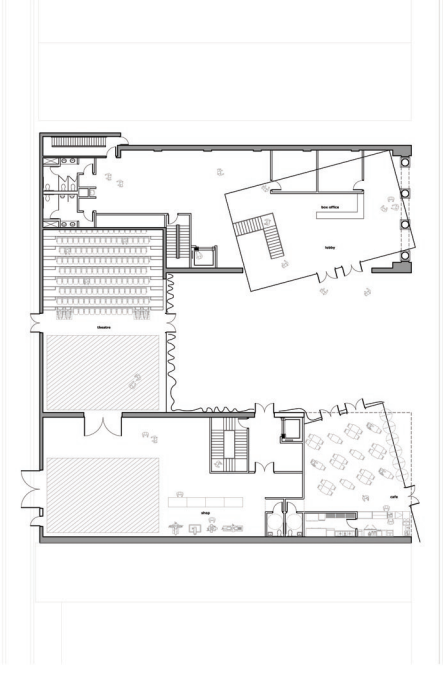


figure 6.4

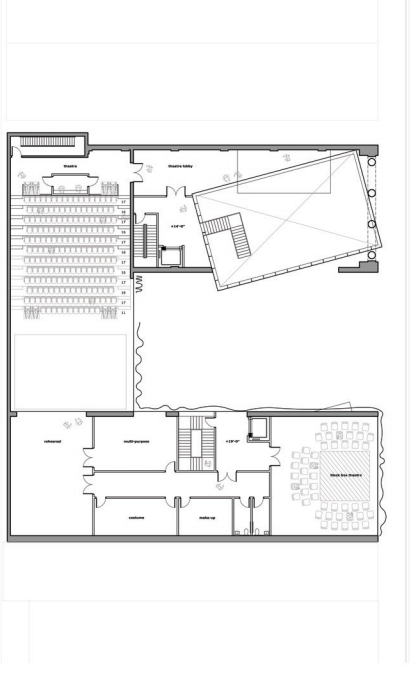


figure 6.5

As a response to the programmatic needs, the complex of the Ensemble Theatre needed to be reorganized. By reconfiguring the program and spaces, the overall complex will be able to operate much better (see figures 6.4-6.7 for proposed plans). As the most pronounced decision, the building occupying 1125 Vine Street is to be removed. Due to its inability to coordinate with the other two buildings as well as its excessive deterioration, it is more logical to remove it. By removing this building, it aids the overall complex allowing the other structures to be fully utilized. It makes the courtyard space much more usable as opposed to the original, tight space. The other major changes to the theatre complex consist of a new construction connector building in the back of the courtyard, extending from 1127 to 1117-119. The theatre is being moved into the newly constructed space, freeing up the majority of 1127 for lobby space and public interaction.

From the standpoint of the building skin, it was necessary to consider the existing facades that required repair. To do this, the four techniques of reclad were applied to the existing facades to evaluate the proper solution. On the two exposed facades of 1127, the ones facing Vine Street and the courtyard, large sections of the brick need to be removed. The lobby will occupy a majority of the space within 1127 through the use of a glazed box. This will signal the entrance to the theatre. The façade that fronts the performance space in the back of the complex utilizes a glazed wall accompanied by a mesh curtain. This will provide opportunities for views in

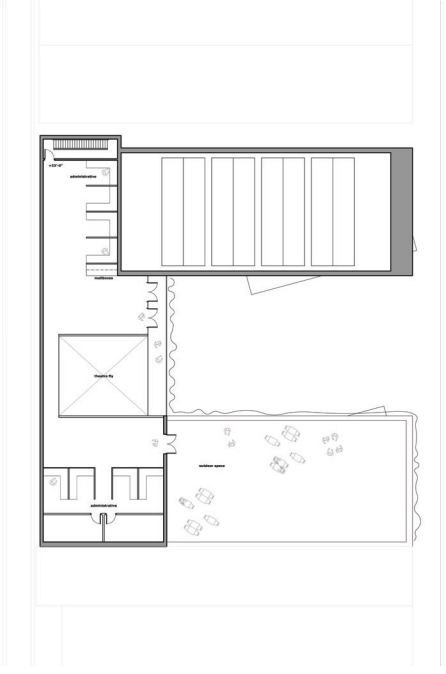


figure 6.6

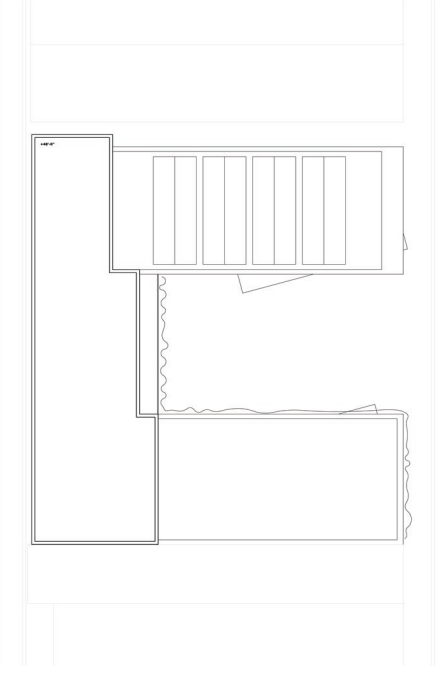


figure 6.7

and out of the theatre while allowing the performance space to spill out into the courtyard through its operable sections. The courtyard facade of 1117-1119 Vine is repaired and improved by a panelized system over a portion of its length. The mesh curtain from the performance resolves behind the panelized façade. This façade system allows much of the existing brick to remain while replacing the damaged sections. The street façade of 1117-1119 is a combination of the curtain wall/mesh curtain skin on the upper level and an operable storefront system on the lower level. The curtain provides a second barrier for performance, efficiency, and aesthetic issues.

The additional program mentioned in the previous section was primarily accommodated in the 1117-1119 property. The front of the first floor houses a café that commands street presence as well as adjacency with the courtyard. The black box theatre was also placed in the front of the building, but on the second floor. This space is large enough for performance, but also shares activity with the street front in order to provoke interest. The equal sized rehearsal and scene-building space occupies the rest of the first floor of 1117-1119. With the theatre relocated in the back of the complex, the preparation space is directly adjacent. This allows for easy access and maneuverability of the manufactured set.

Within the theatre space, the seating is re-raked to obtain the proper angle. Eight handicapped spaces were added to the 191-seat capacity, four on the bottom of the rake

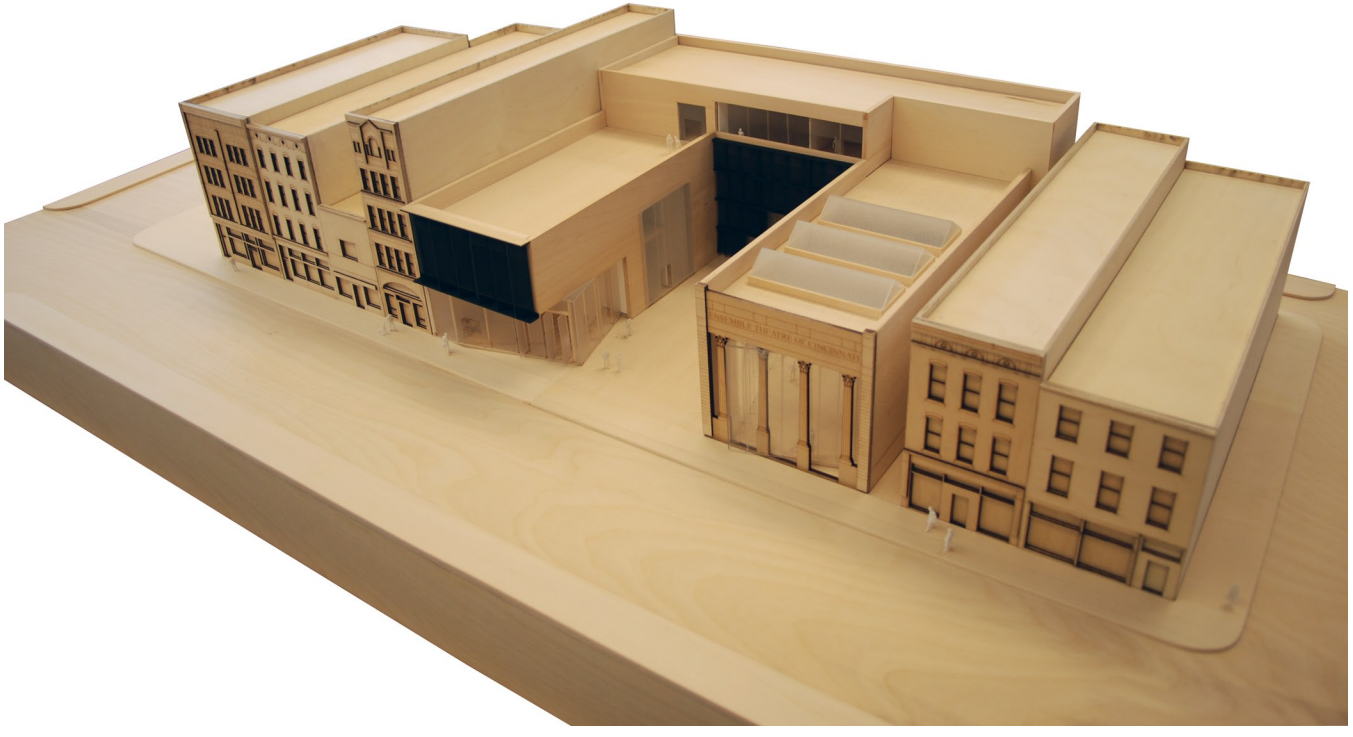
and four on top. Due to the new construction between 1127 and 1117-1119, a theatre fly could be added. This will allow the theatre more flexibility in their performances. The rest of the new construction provides for administration spaces for the ETC. From the upper floors, the roof of 1117-1119 is accessible. The outdoor space serves primarily as leisure space for employees of the Ensemble Theatre.

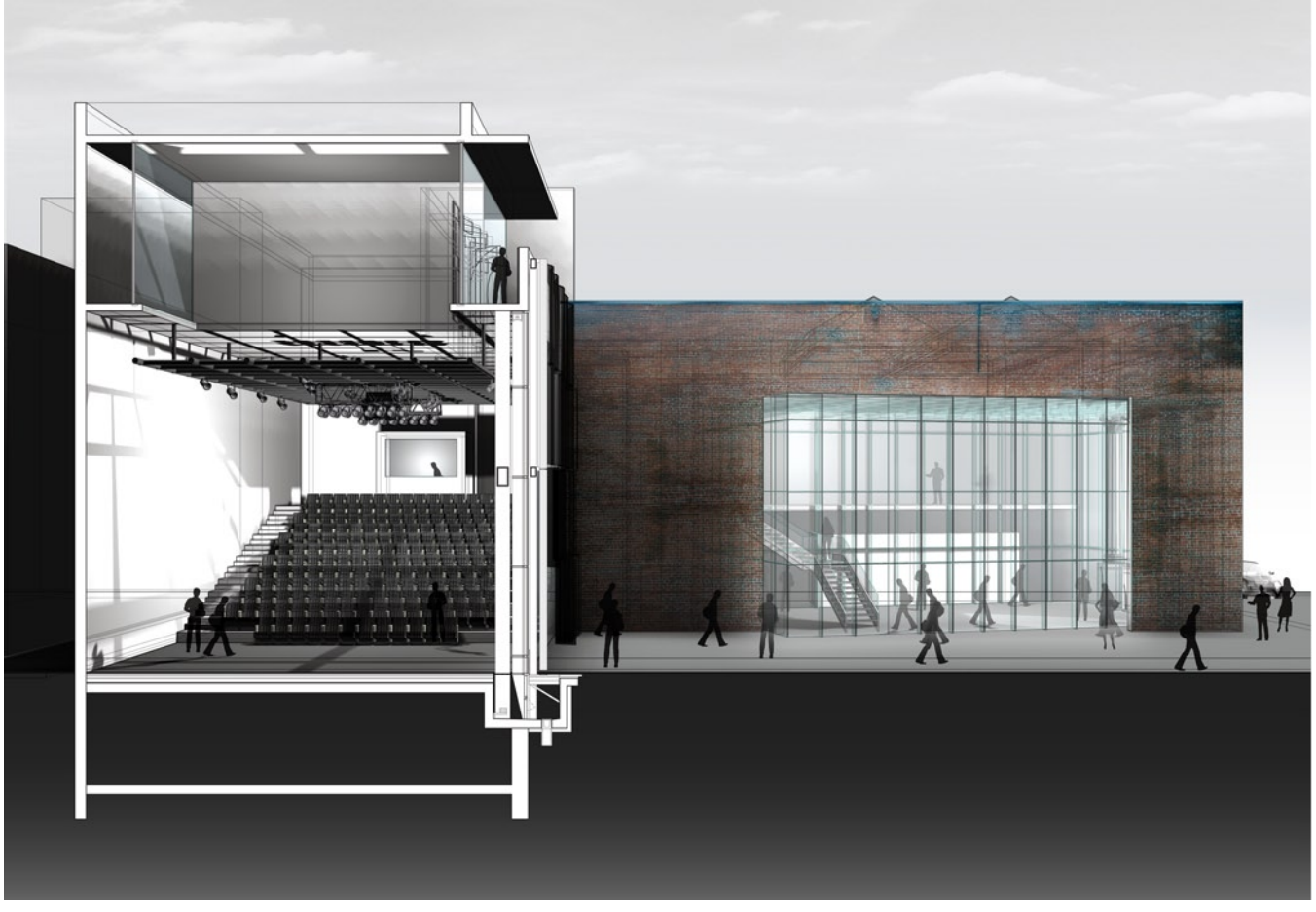
With the new organization and building skins, the building complex can successfully serve the Ensemble Theatre of Cincinnati and its patrons. Performances have much more flexibility in their scale due to the new theatre space as well as black box theatre. The unified complex has a strong presence on Vine Street and promotes much more activity due to this presence.

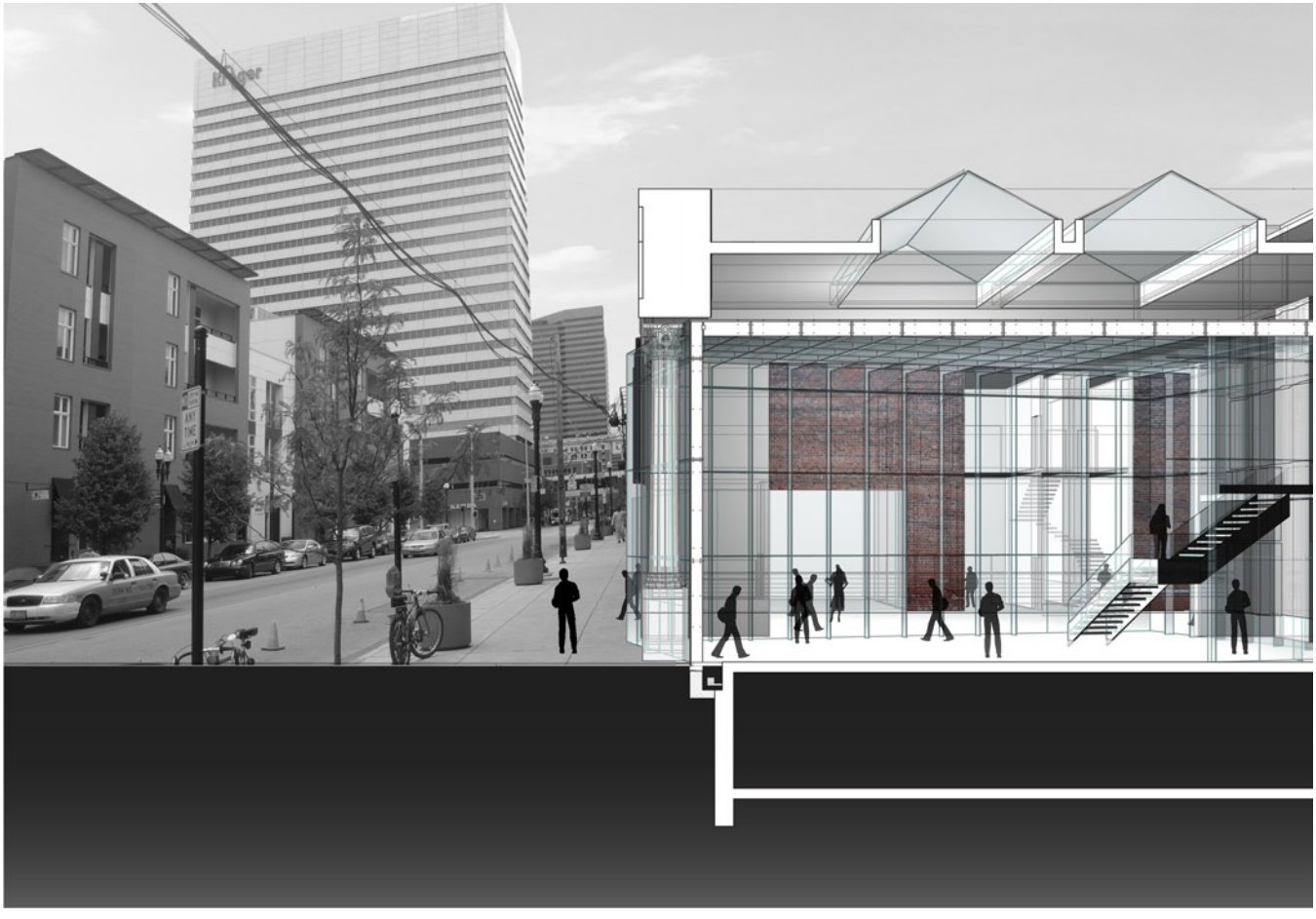
07 Schematic Design

Project Images

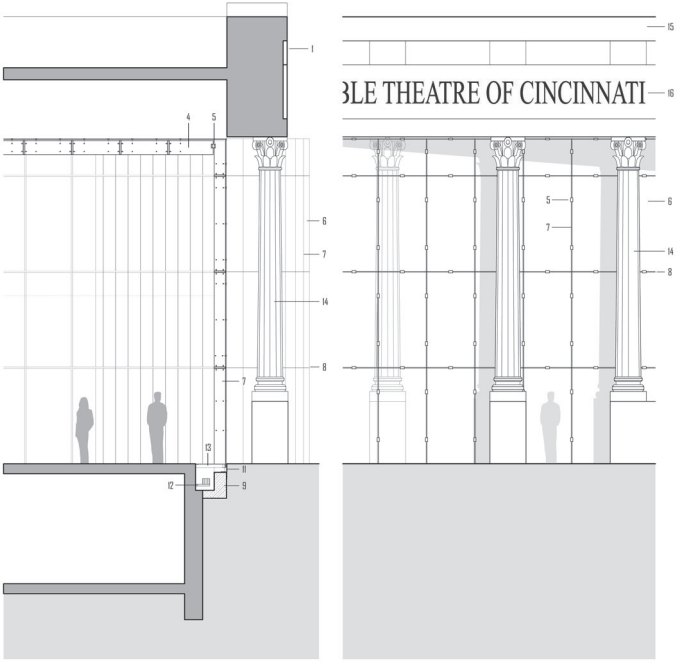
The following section is intended to exemplify the schematic design of this thesis project. The images relate to complex studies, façade iterations, representation and technical details. The design is an ongoing process derived from many of the following iterations. The final product will be a hybrid of the representations aimed at providing a high-performing, efficient theatre complex through renovation using the building skin as the primary tool.





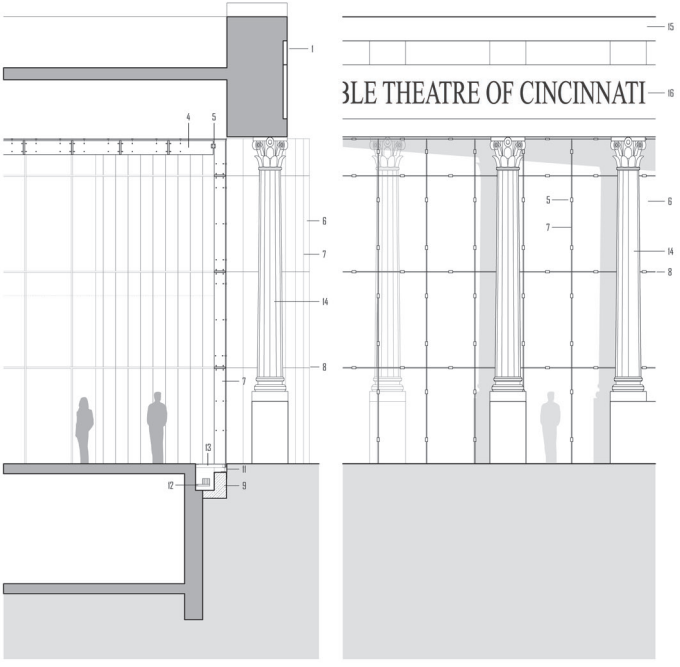


Facade Section A-A
Scale 1/4" = 1'-0"



1 existing masonry construction
2 new structural steel lintel
3 existing hvac ductwork
4 laminated glass beam
5 stainless steel attachment hardware
6 insulating glazing system w/ safety glass
7 laminated glass fin/column
8 bracing glass fin
9 new masonry construction
10 structural steel tube
11 structural steel angles
12 convector
13 stainless steel grate
14 existing monumental column
15 existing decorative pediment
16 existing building name
17 repointed masonry
18 integrated light fixture
19 steel column
20 external structural for metal mesh curtain
21 metal mesh curtain
22 fresh air intake cover
23 air inlet flap
24 drain
25 bracing steel bracket for glass fin
26 theatre seating/rake
27 theatre rack/lighting
28 operable glazing panels
29 cafe
30 recessed aluminum mullion
31 black box theatre
32 rooftop patio
33 elevator cab
34 elevator shaft
35 aluminum mullion
36 spandrel panel

Facade Section A-A
Scale 1/4" = 1'-0"



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17 repointed masonry
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27 theatre rack/lighting
28 operable glazing panels
29 cafe
30 recessed aluminum mullion
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33 elevator cab
34 elevator shaft
35 aluminum mullion
36 spandrel panel

Facade Section C-C
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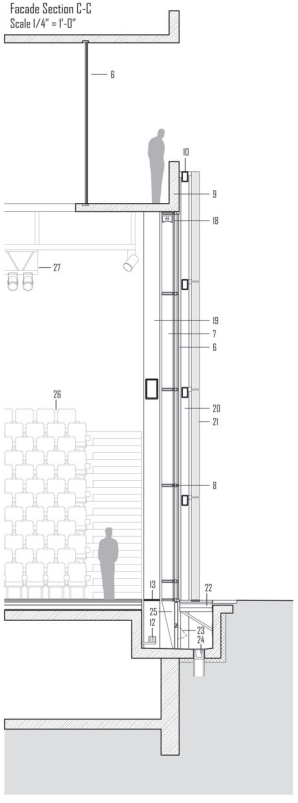

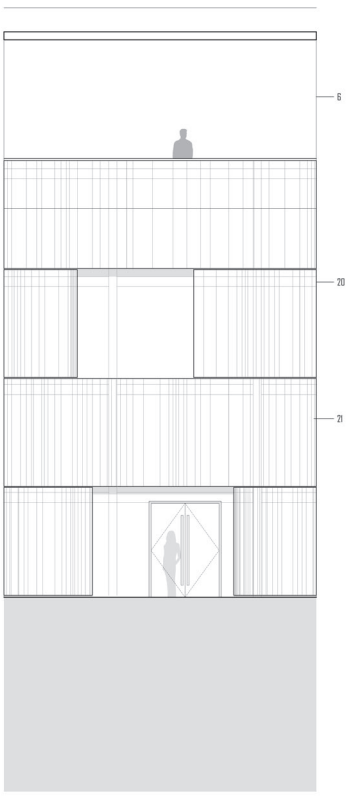

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14 existing monumental column
15 existing decorative pediment
16 existing building name
17 repointed masonry
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27 theatre rack/lighting
28 operable glazing panels
29 cafe
30 recessed aluminum mullion
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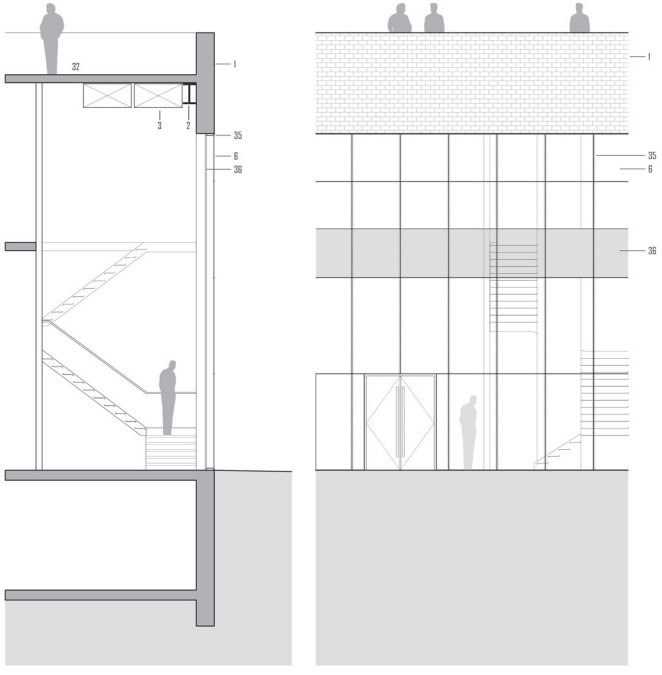
33 elevator cab
34 elevator shaft
35 aluminum mullion
36 spandrel panel

Facade Section D-D
Scale 1/4" = 1'-0"



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28 operable glazing panels
29 cafe
30 recessed aluminum mullion
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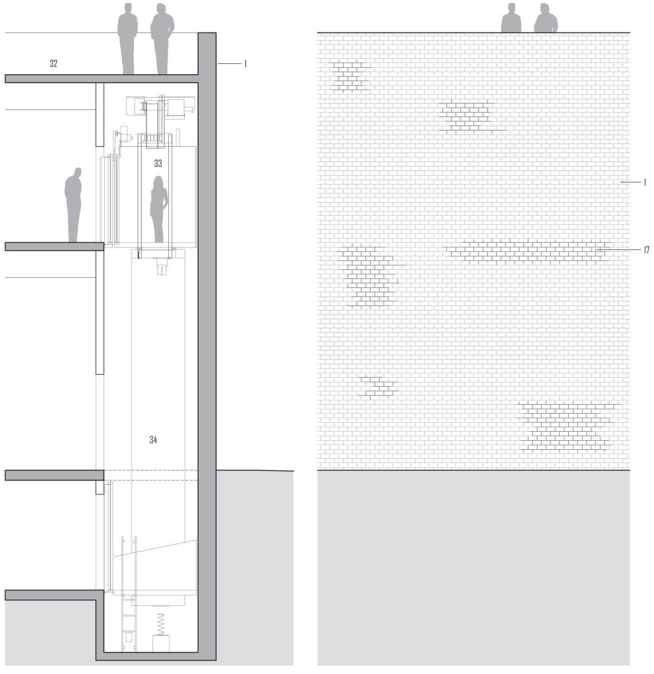
33 elevator cab
34 elevator shaft
35 aluminum mullion
36 spandrel panel

Facade Section E-E
Scale 1/4" = 1'-0"



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27 theatre rack/lighting
28 operable glazing panels
29 cafe
30 recessed aluminum mullion
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32 rooftop patio
33 elevator cab
34 elevator shaft
35 aluminum mullion
36 spandrel panel

Facade Section F-F
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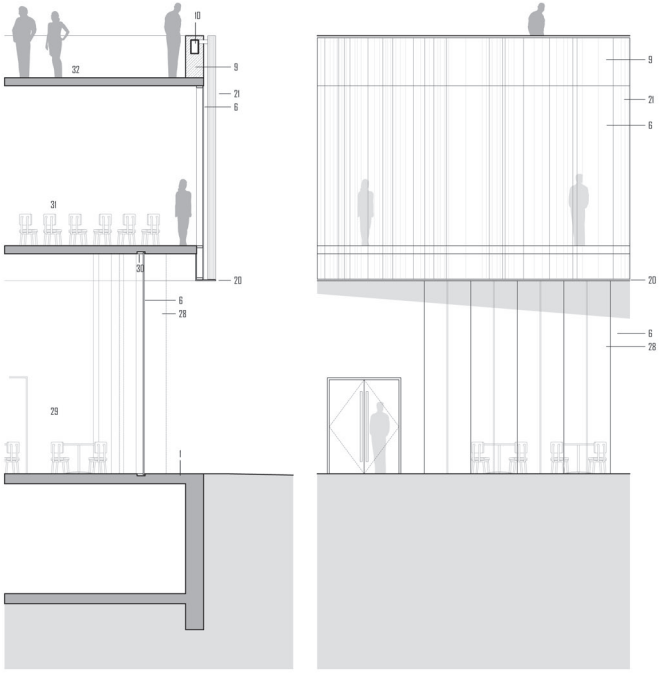

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29 cafe
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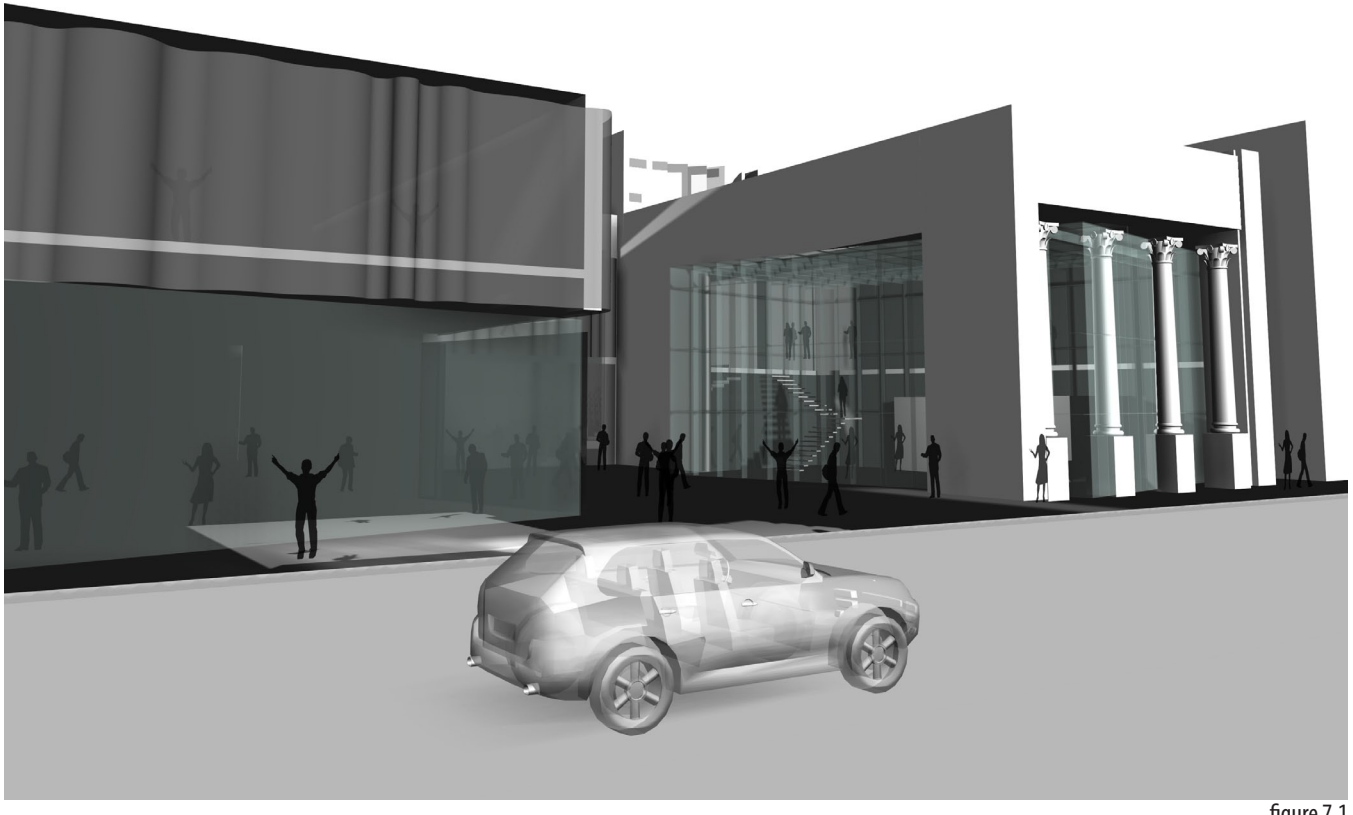
32 rooftop patio
33 elevator cab
34 elevator shaft
35 aluminum mullion
36 spandrel panel

figure 7.0



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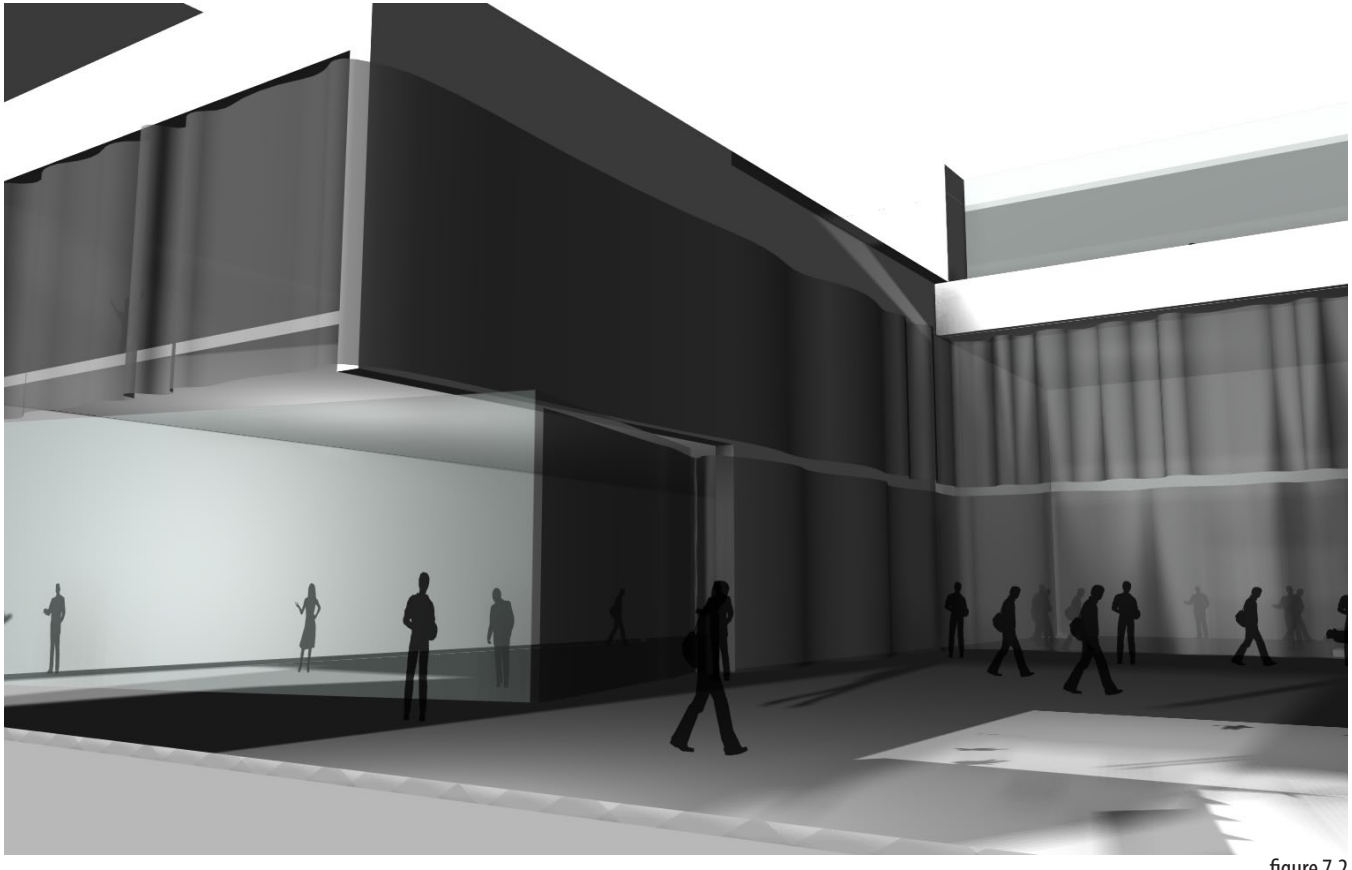

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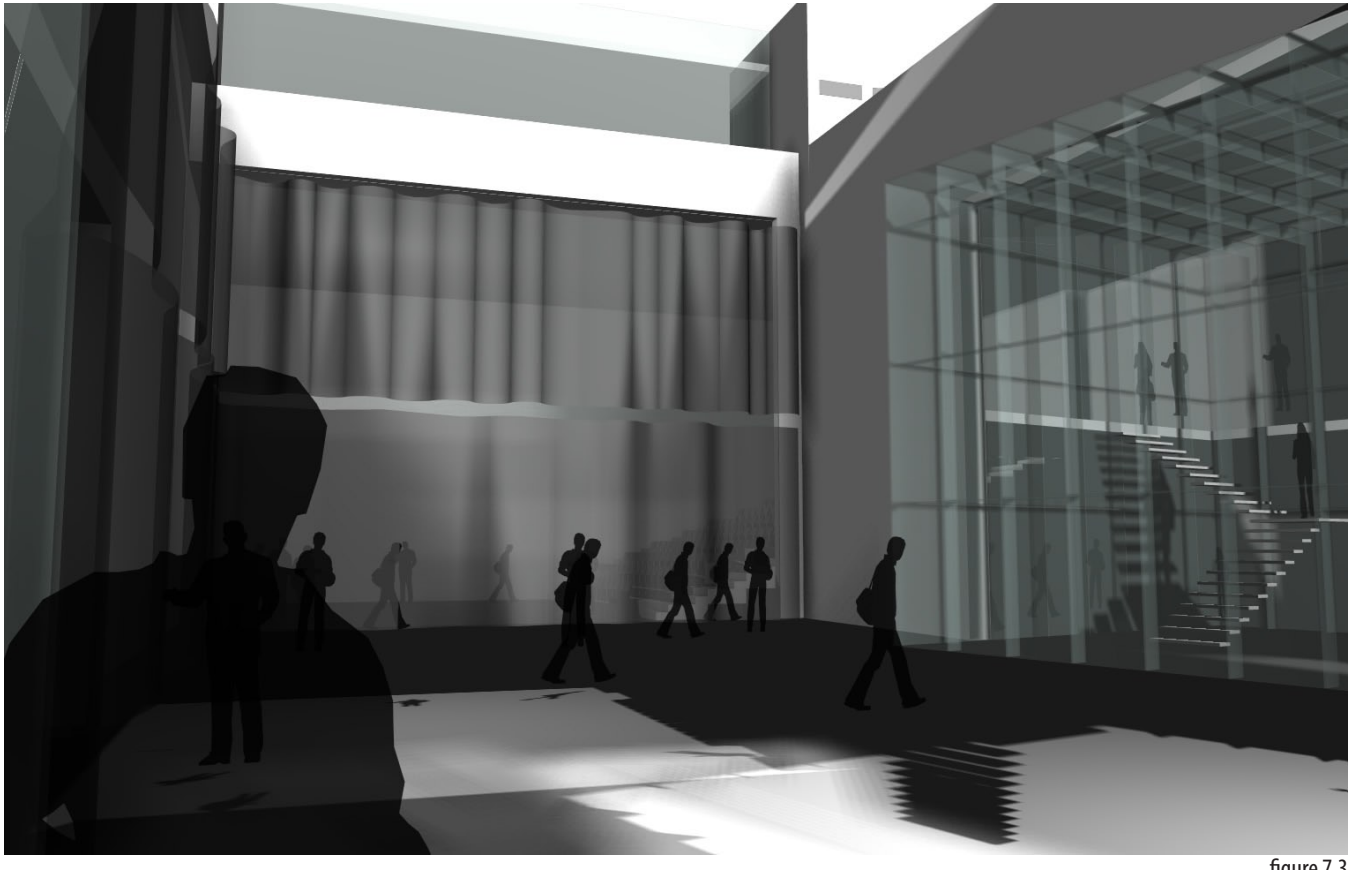

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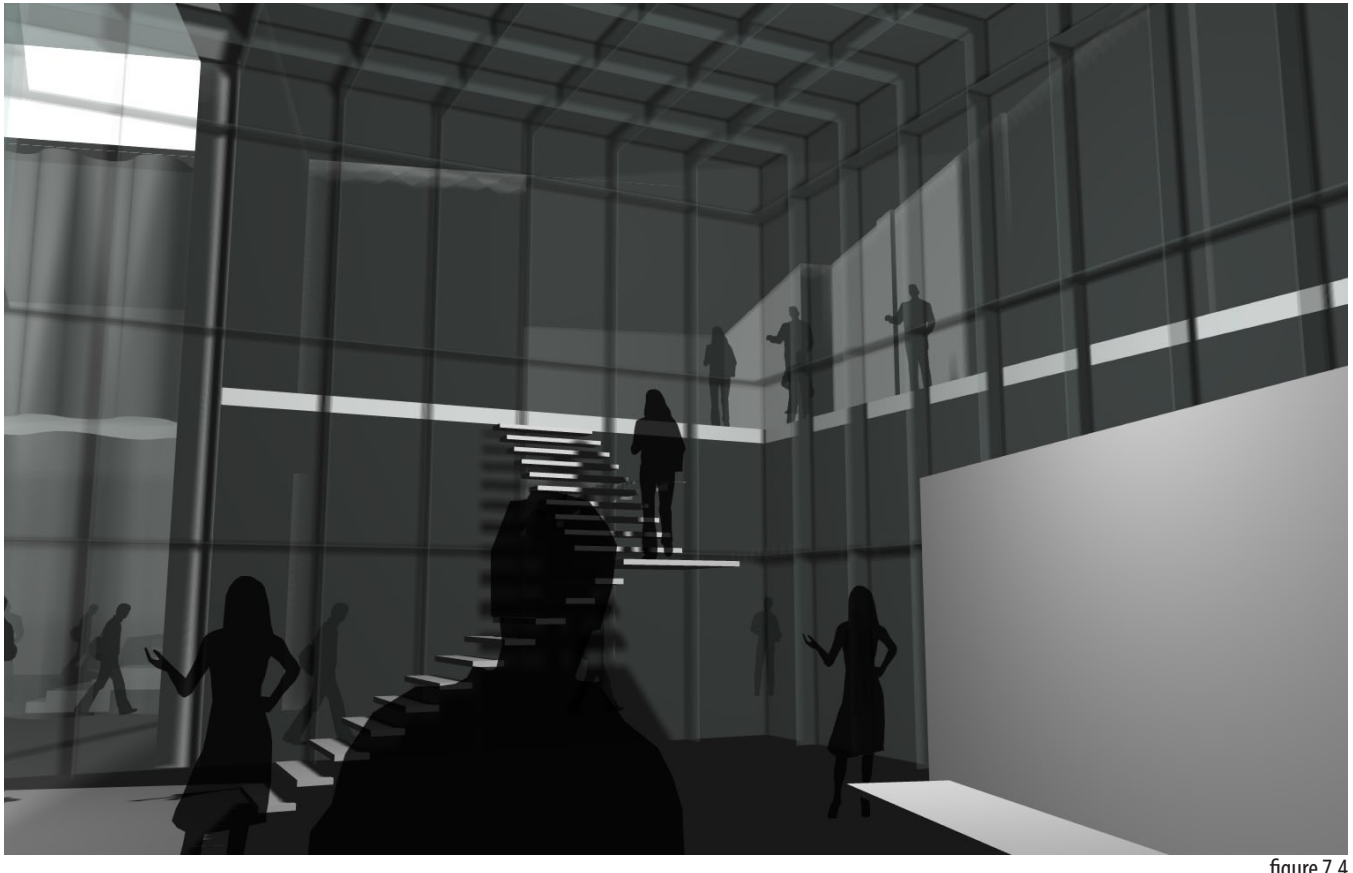

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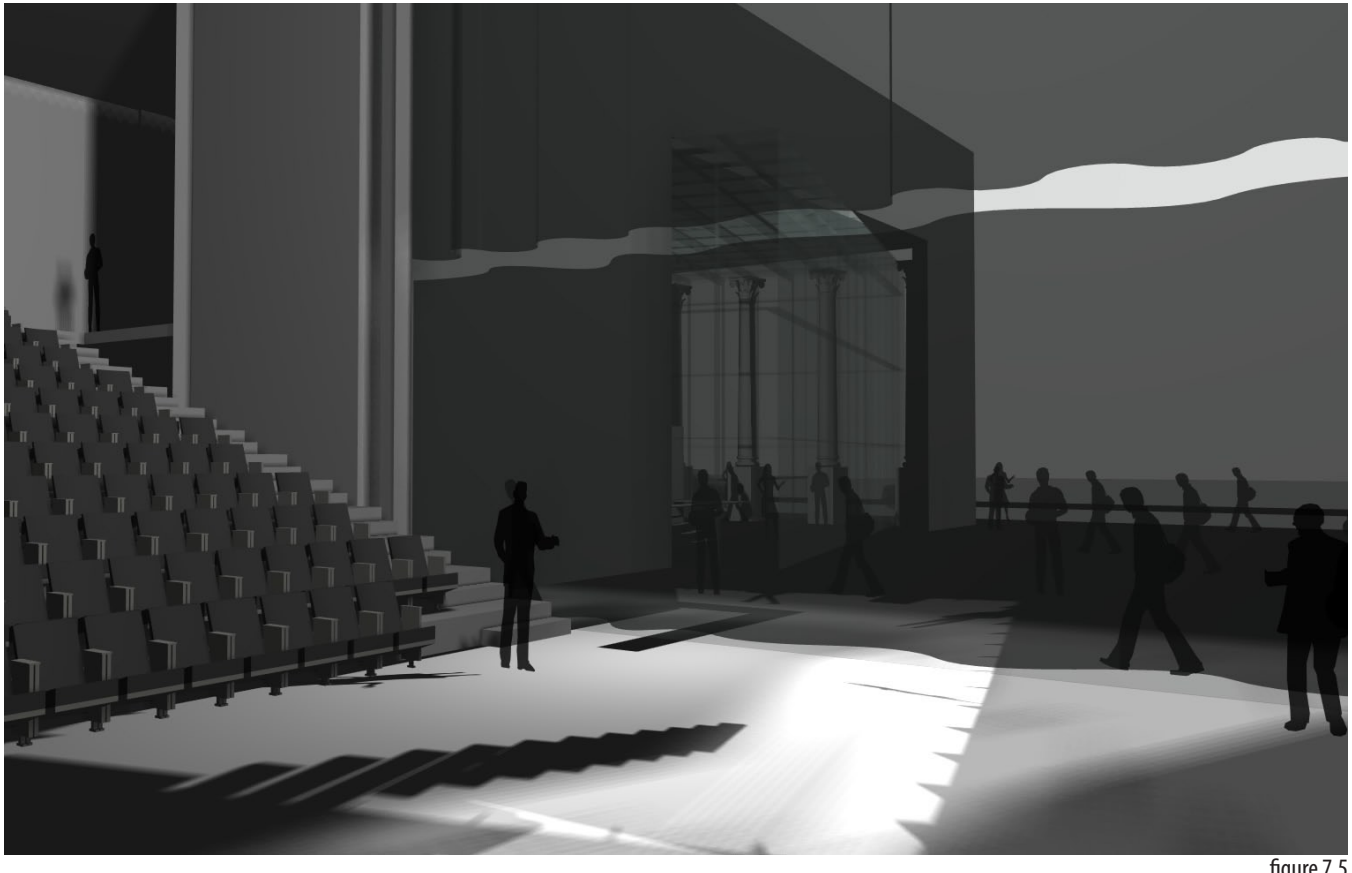

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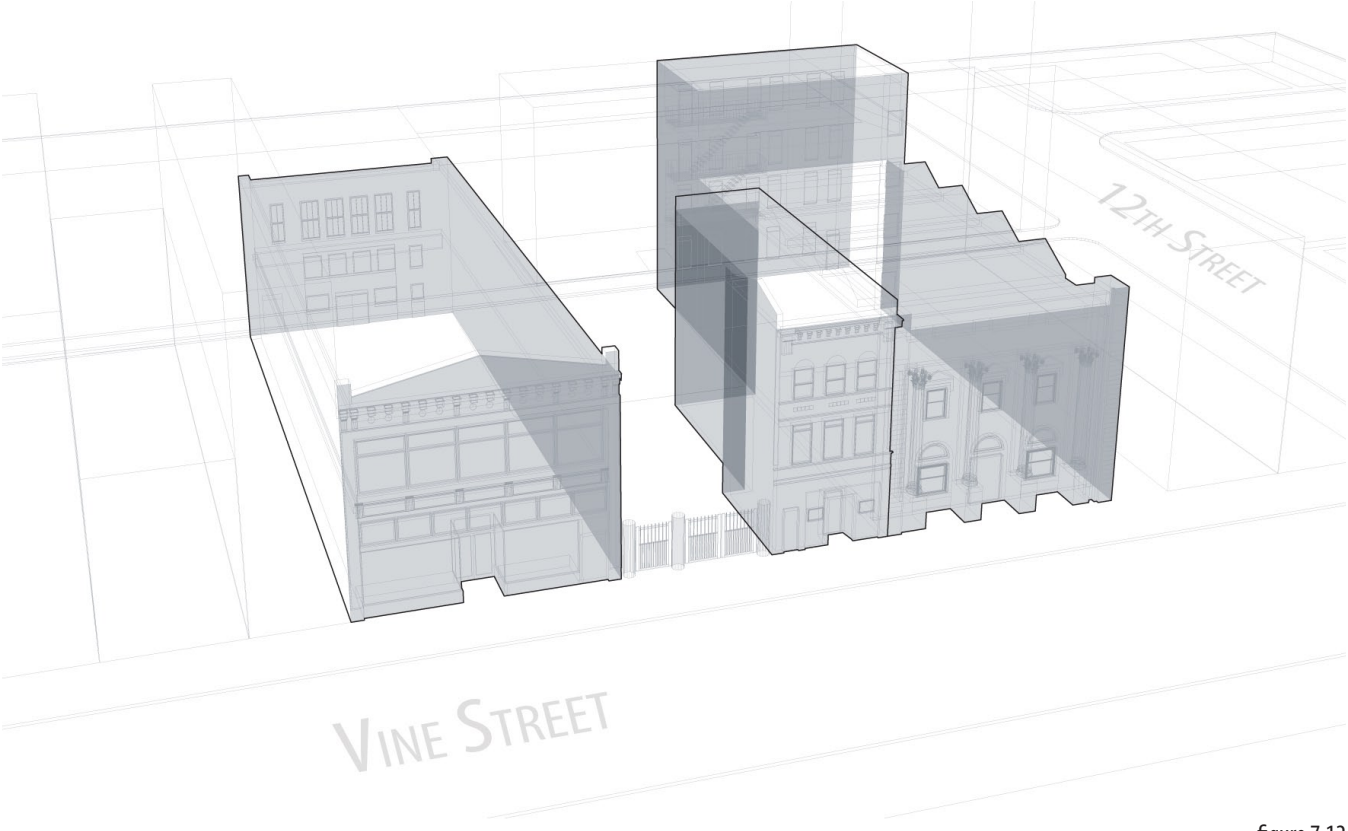

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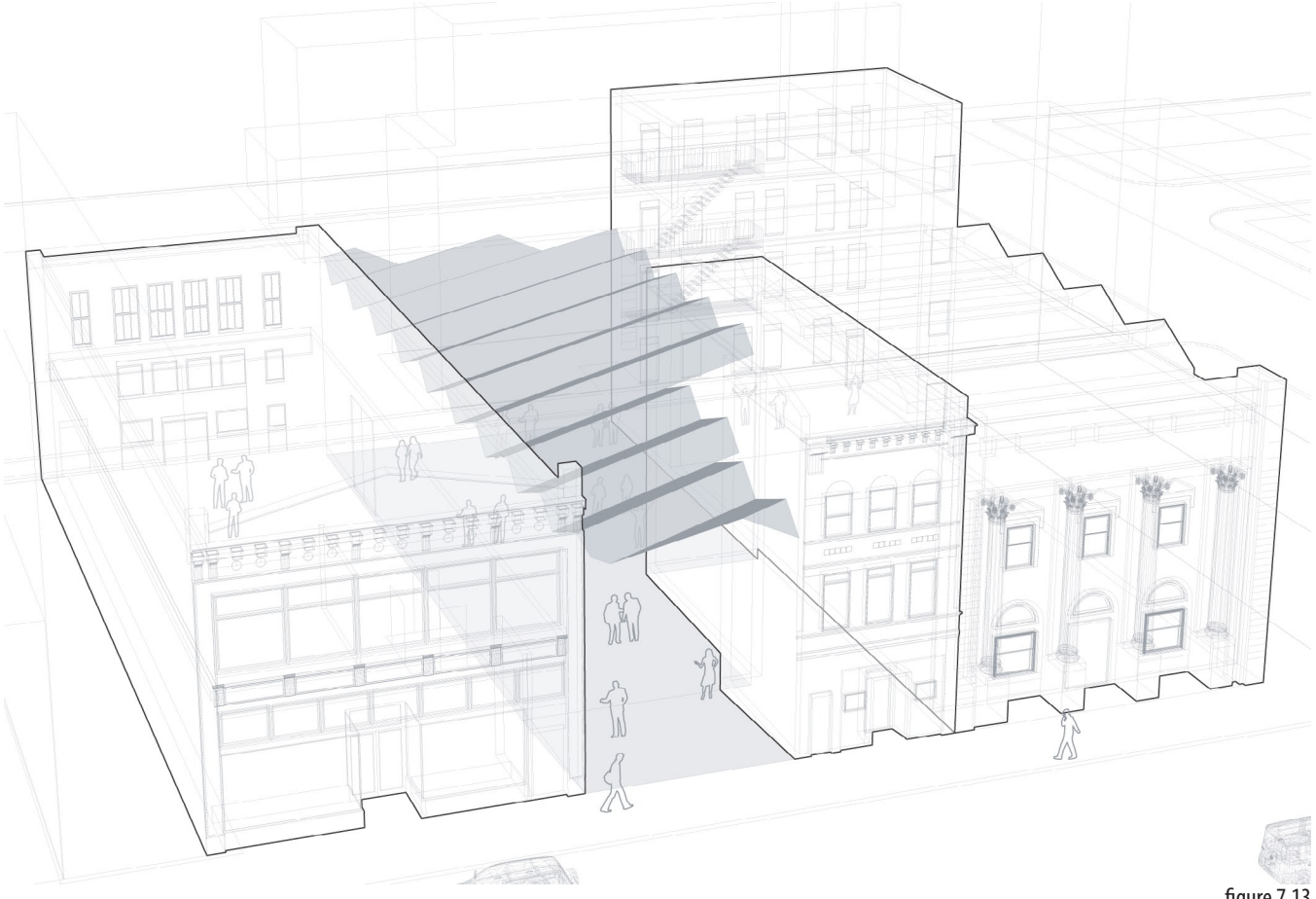

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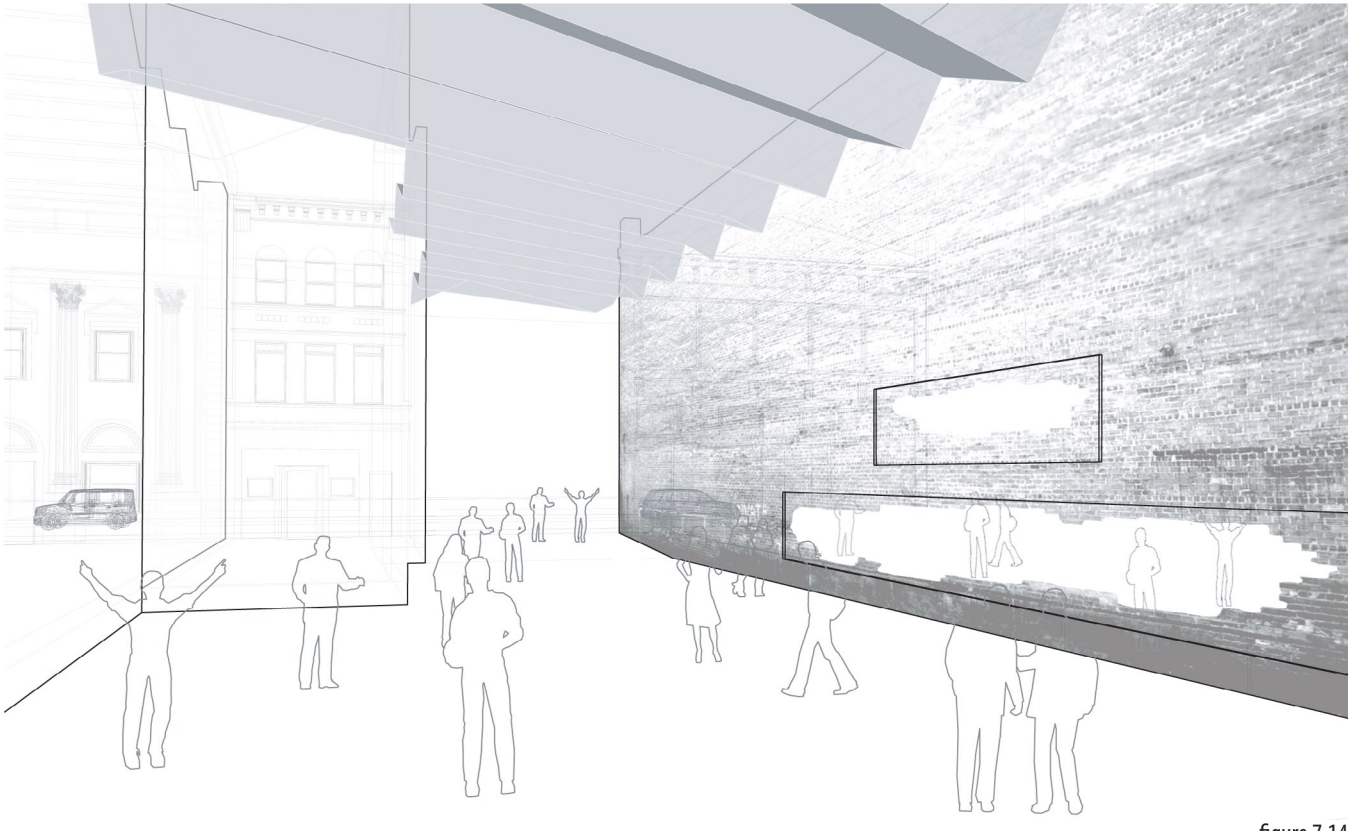
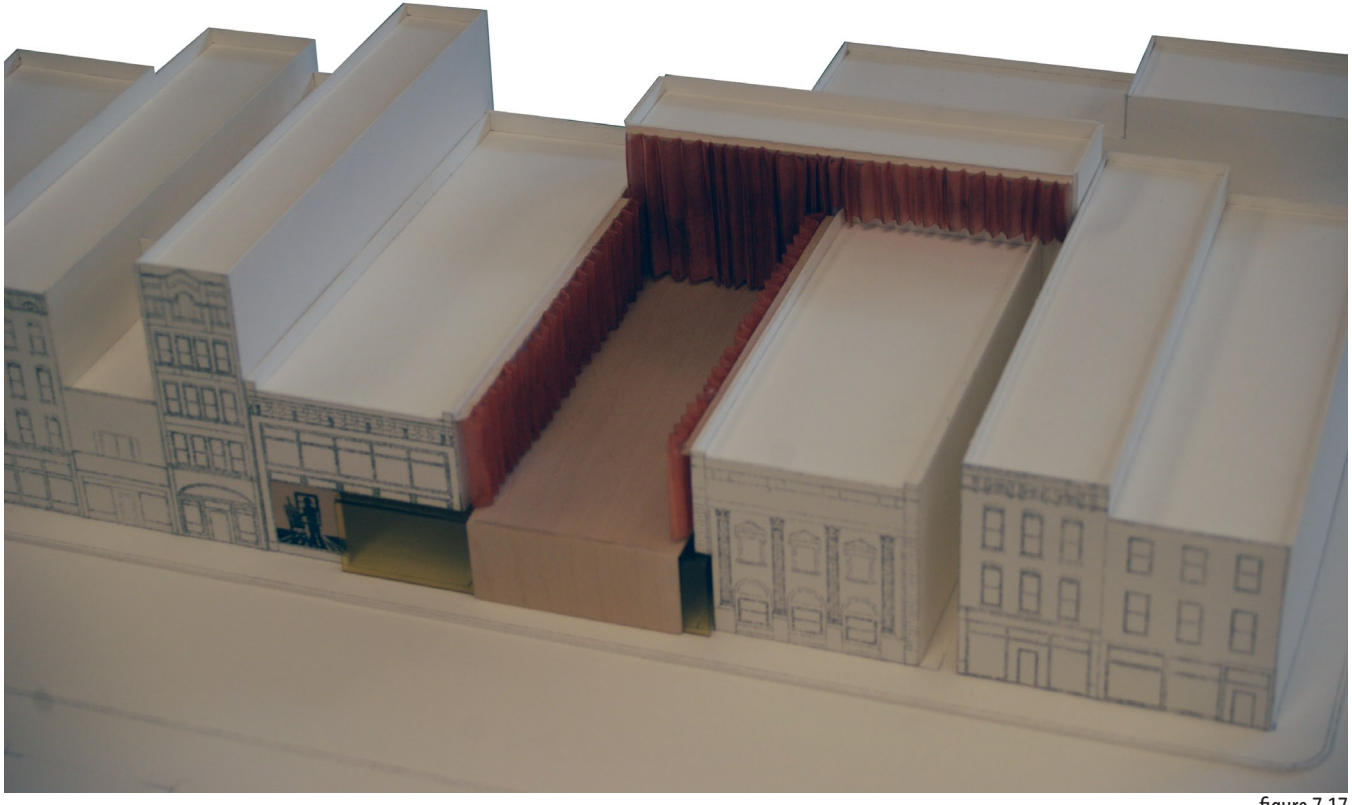


figure 7.14

figure 7.15

figure 7.16



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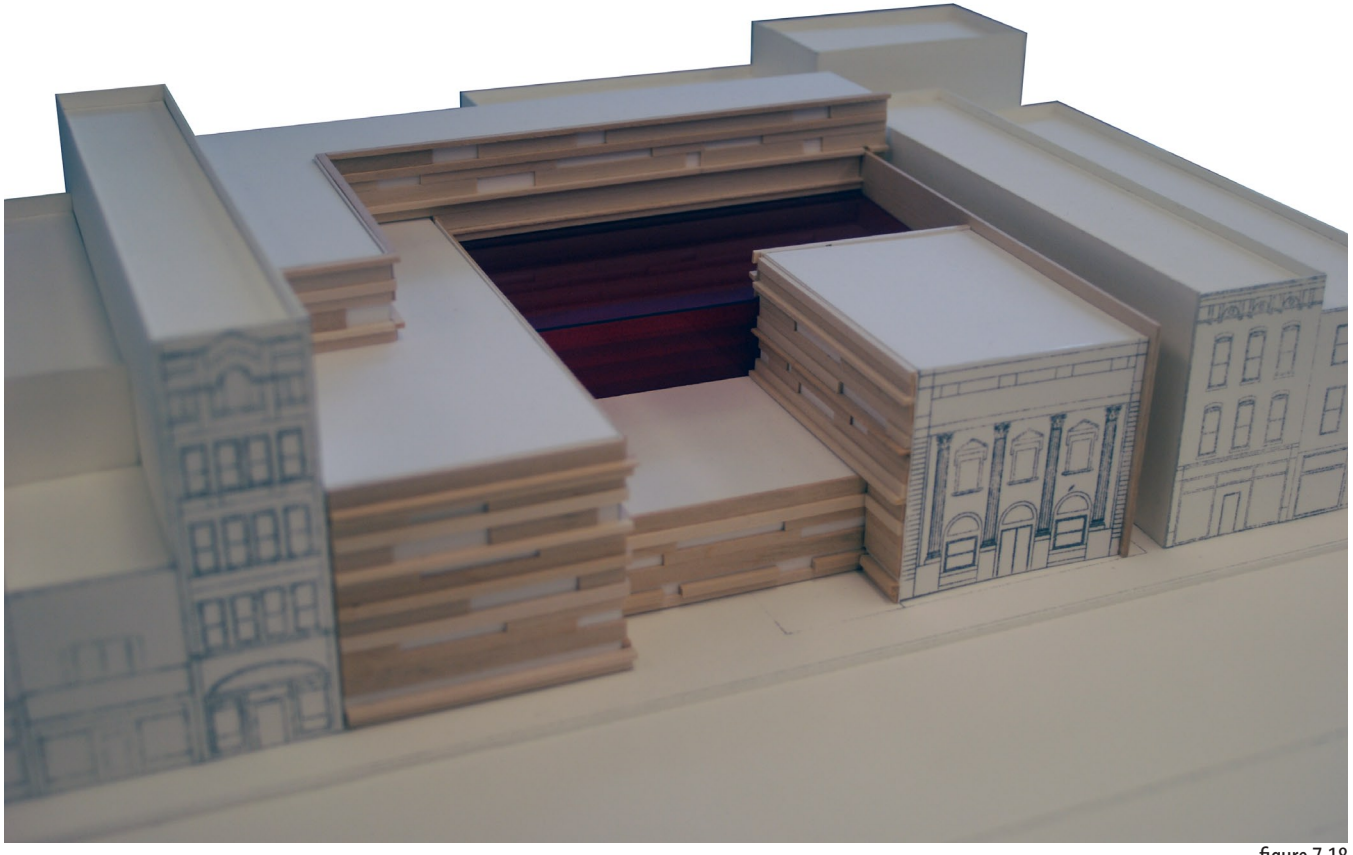

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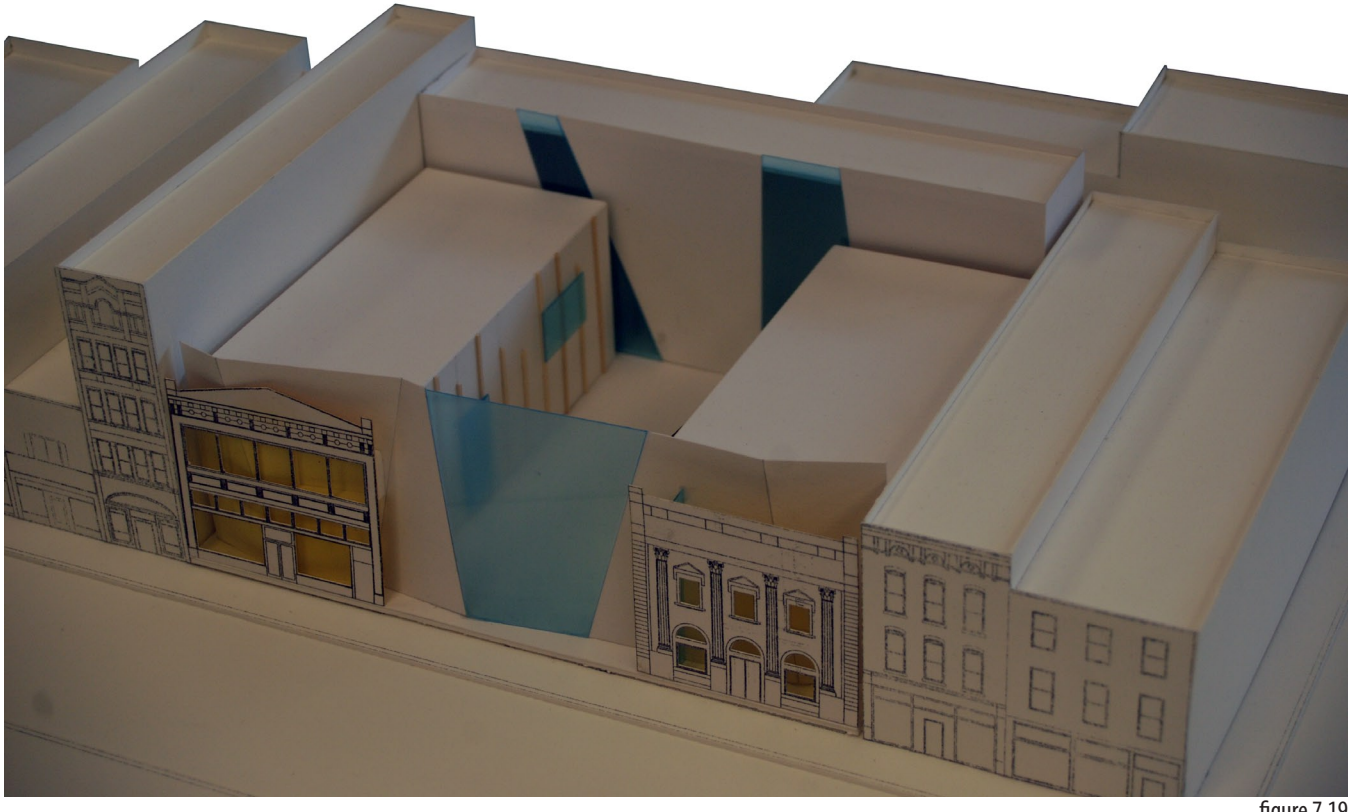

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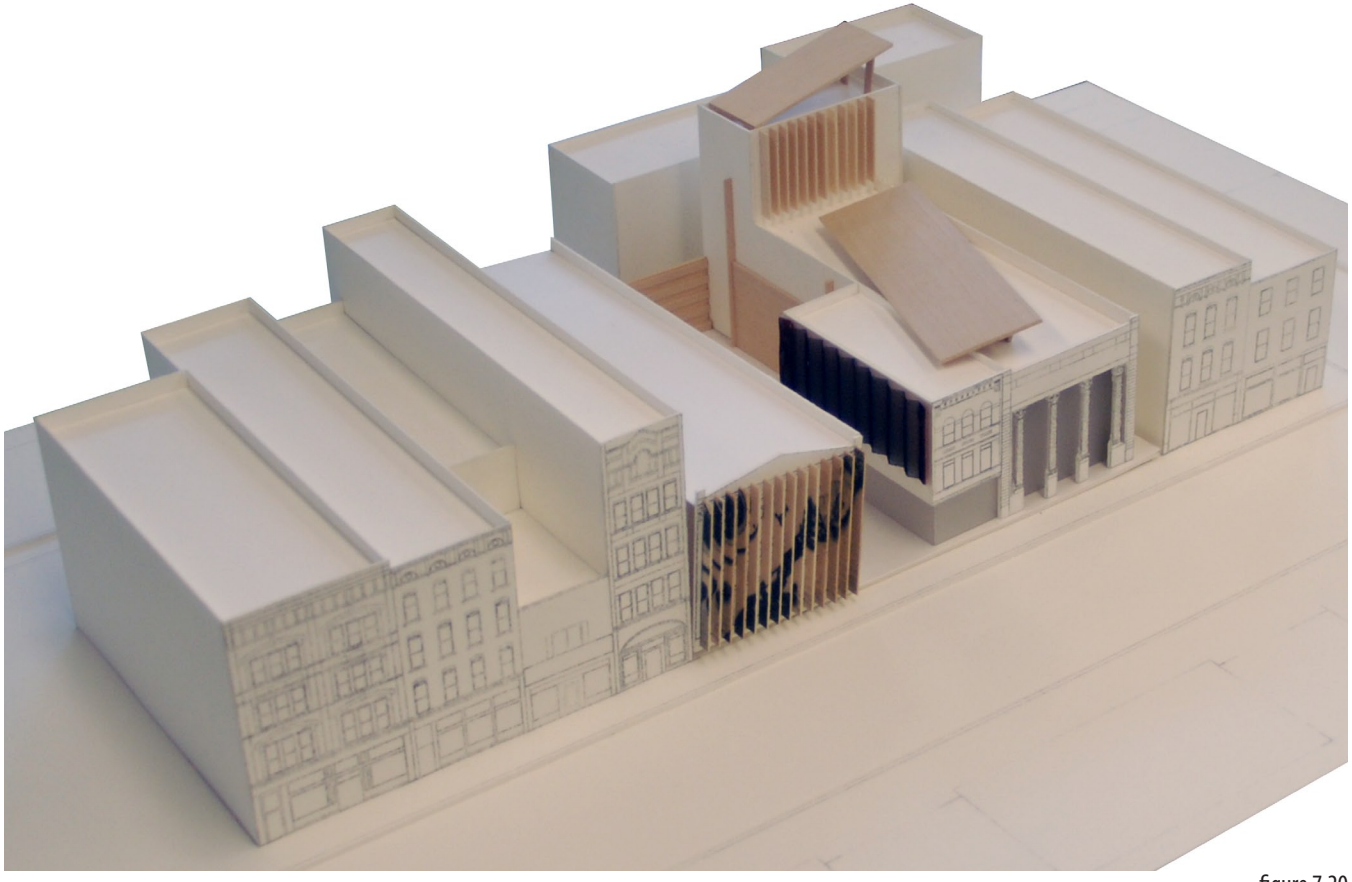

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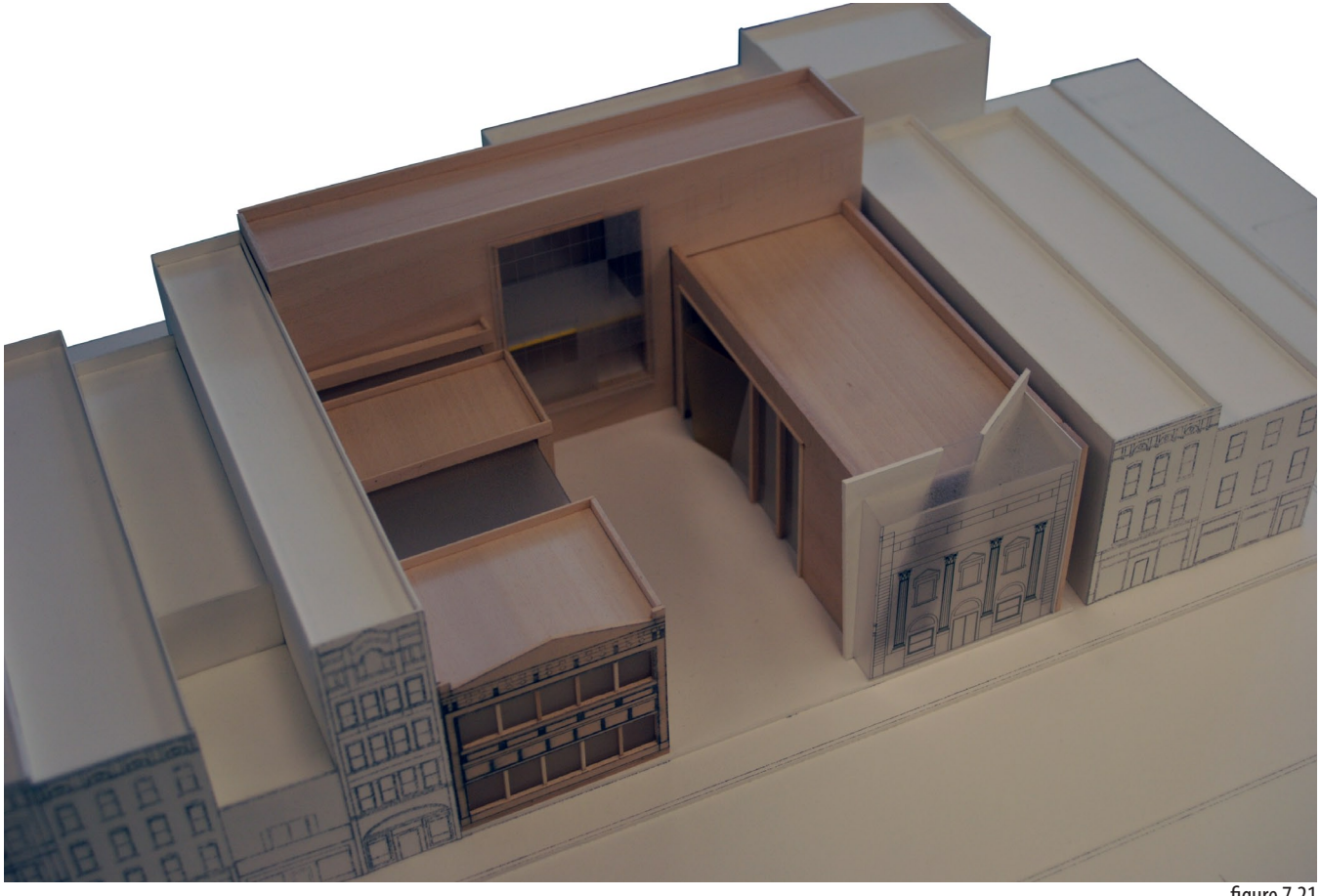

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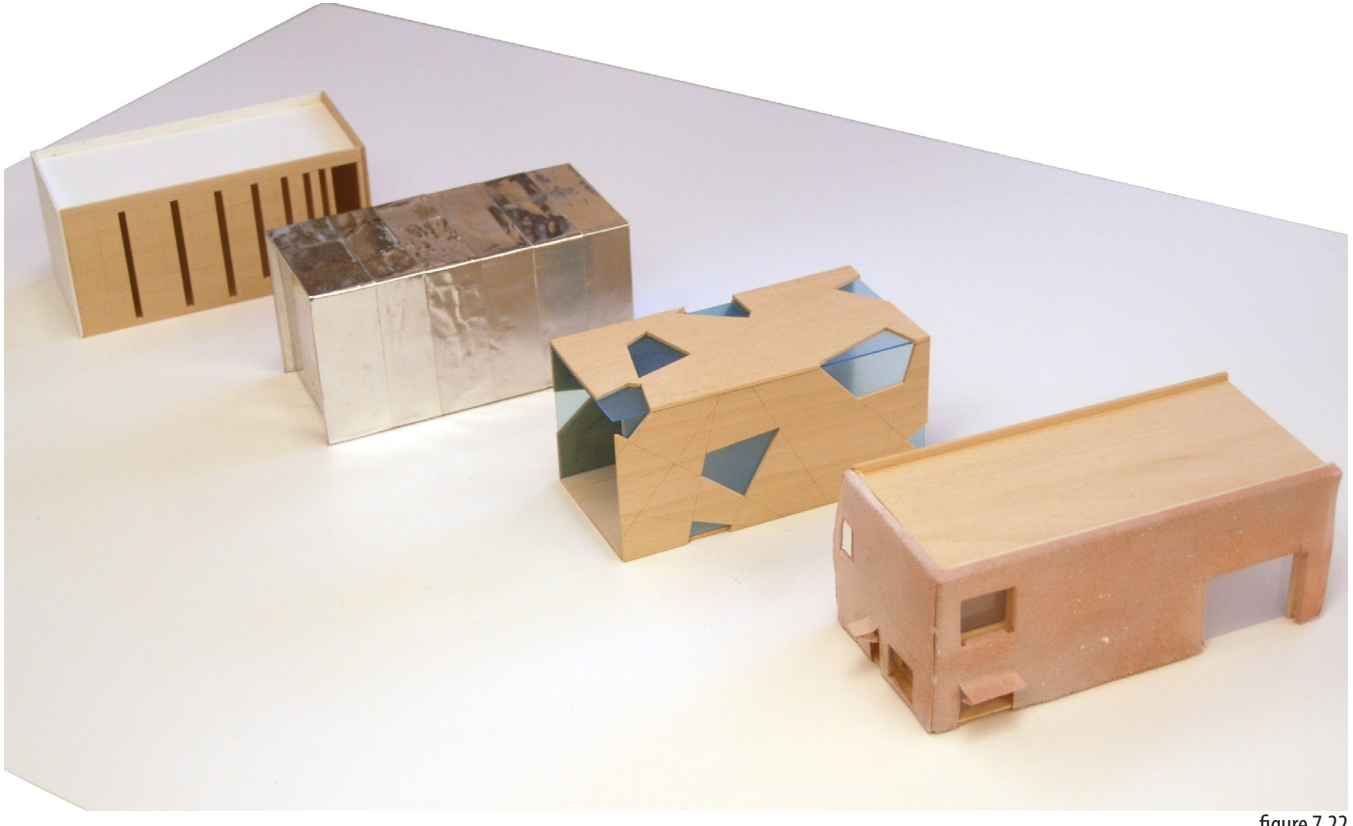

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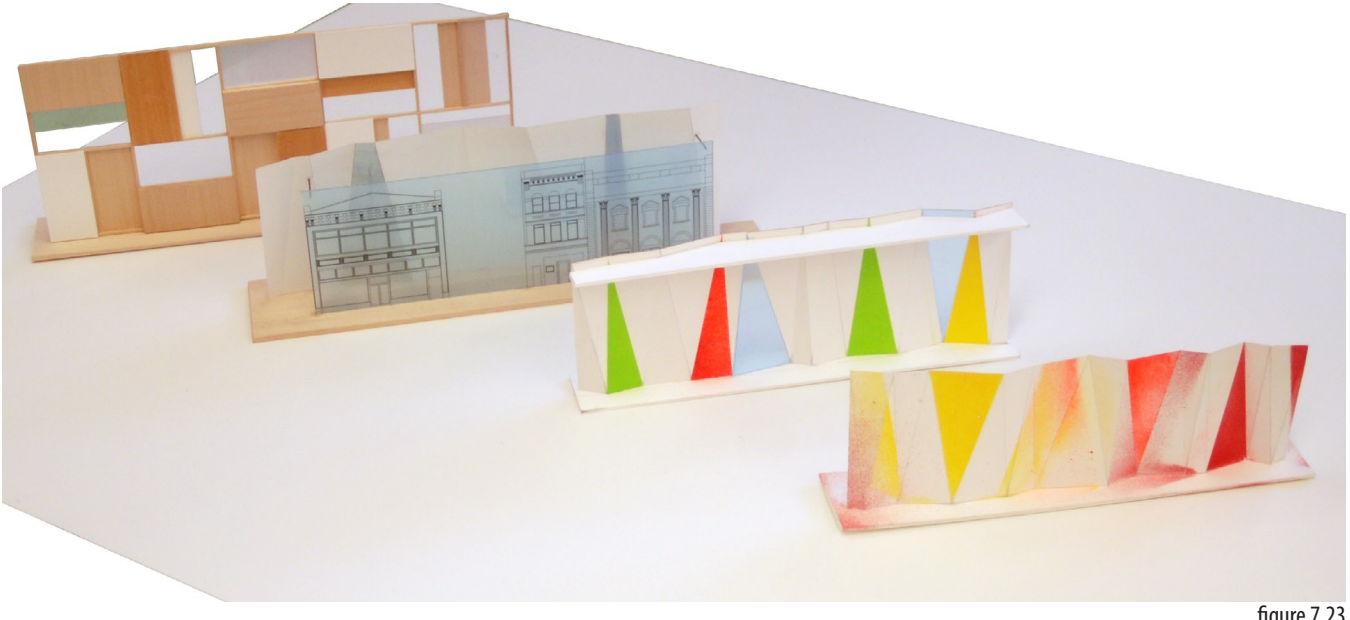

figure 7.23

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