REFINING THE AESTHETIC PIECES OF A MODULAR HOME
An Analytical Process To Understand The Detail

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REFINING THE AESTHETIC PIECES OF A MODULAR HOME
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Thesis Design

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Throughout my six years of college at Ball State University I have been tested in many different circumstances. Through this period I have matured to gain better understanding of the world in which we live architecturally, socially and personally. To this I thank my professors (particularly Art Schaller and Bob Koester for their support this final semester of thesis), my friends and fellow students. I would also like to thank my family: Phil, Jo and Brian Cradick for their support and understanding over the years.
INTRODUCTION

During my five years in the College of Architecture and Planning I have felt my projects have lacked a certain level of detail and theory to drive the design process. As a solution I looked for a personal theory flexible enough that it could continue to be developed after graduation. As a tool to accomplish this I realized my attraction to the classical Japanese style of architecture deserved a further exploration into the reasons for this unjustified attraction. The aesthetic considerations in the style is the focus. To begin I found a highly published architectural example which could provide the most information both graphically and verbally. This is the Katsura Palace or Villa. It's design proved to be a fine example of the ideals and theories focused in the traditional Japanese culture. I then decided the actual thesis project design would be a house. I choose a house do to its small scale. Therefore, I would be better able to focus on the details which had not been totally possible in previous projects. After the analysis of the Katsura Villa I still had a vague idea of how to translate a historical architecture to a modern personal philosophy with which to continue or develop a personal theory. I needed an intermediate step to get from point A (the analysis) to point B (the project). Therefore, I introduced a further analysis, not of the pieces, but of the styles which created the program for Katsura. These are the Shoin and Sukiya styles. This provided the justification for the elements of the previous analysis. To translate this to a modern theory I looked at several architects.
that I believed had theories or styles that could be compared to the Shoin and Sukiya styles. I realized that the elements of Katsura could not be transferred to the modern with the same meaning in today's society or that it would prove to be anything that could be developed to increase my own theories. However, The theories behind Katsura or classical Japanese architecture can be translated and applied to any context because it purely exists as a theory and not a solution. I interpreted these architects styles as possible solutions that could fit within the theories to gain an understanding for the modern concept solution. As I developed this historicism I was able to use it as a tool with which to build my own theories and design the home. Although, these theories could be applied to any project. By starting with the details and understanding them I could continue as I moved up in scale. Each of these steps, the analysis, the transitional analysis and the actual project is able to stand apart independently but its meaning relies on the previous for the complete understanding.

My concern focused the theories on the aesthetic responsibility that can be understood and developed as I continue to learn. The elements that create the beauty or the aesthetic of a place is found in the pieces and details to create the whole picture. Therefore, I used the modular home to express the construction of the elements and refined them to understand aesthetic responsibility.
KATSURA VILLA ANALYSIS
A PERSONAL OBSERVATION OF THE ELEMENTS

Site Plan of the Katsura Villa
1. Main Gate
2. Royal Gate
3. Ordinary Gate
4. Inner Gate
5. Gepparrika Pavilion
6. Old Shoin
7. Winter House
8. Music Room
9. New Garden
10. Water Bench
11. Stone Bench
12. Amoire-Stockholm
13. Shidenkai Pavilion
14. Shikidenkai Pavilion
15. Overhead Waterfall
16. Shikanomi Pavilion
17. Middle Lake
SITE
Approach: Landscape is so well crafted it becomes part of nature and man's intervention seems to disappear.

- processional of entry gates and pathways
- trip through nature deep into planned landscape
- man made parts worn by elements and human traffic
- blending of various materials into landscape
- ideals of craft in nature by precision of hand laid stones

What is seen and when? The natural surroundings are manipulated to obtain the most picturesque views of natural and man made elements on the landscape at various points around the Katsura complex.

- stepping stones vs. paths
stepping stones: force the eye to to look down for every step so not to fall, it disrupts any rhythm disallowing the eye to look around until a stopping point occurs
paths: allow for a continuous rhythm allowing the eye to look around, this occurs at places of particular beauty where it is encouraged to to view a particular element
- stopping points are noted by gates, wider openings or change of materials such as a giant stepping stone
- series of views changing with each step
- procession to built environment from nature
- nature / loose paths / gates / strict paths / man made environment
- transition to more refined elements as approach Shoin structures
paths / stepping stones / exterior porches / interior spaces
**Perspective Massing:** The landscape creates views of built structure which are framed by natural elements particularly in views across or around the water.

-Nature = low lying vegetation next to paths / medium / large vegetation away from path
-from selected views along path to the buildings the structures integrate into massing of landscape as a base or as a back drop framing the structure and allowing it to blend into nature
-flat landscape around structure for a clear perception of form and response to the climate

**Plan Massing:** The Main Shoin structures have been added on to three times which creates some awkward connections, however, the plan remains responsive to the climate and context.

-"flying geese layout" = step back to allow for light penetration, air circulation
-arrangement around axis which can be staggered
-designed to focus on mid-Autumn moon to South and reflected on pond

**Communication of Profile:** The profile is recognized as a shelter which is responsive to the context and culture which is highly functional and logical in form.

-environmentally responsive sloped roofs
-hierarchy dismissed in numerous additions to Shoins
-functional in circulation, structure, construction, climate
-repetition of structure and roof style to unify
Connection to earth: The villa sits gently on the landscape as if it has been planted in the earth. The base is simple stone with a square wood post penetrating it.

- transition of textures to structure
  lawn / grass / gravel / poured concrete equivalent / stone bases
- hip roofs tie structure to landscape break down mass of roof and creating a uniform horizontal line running the perimeter of the roof
- materials of natural elements common to context
- texture left unrefined and allowed to expose natural growth
- color is of earthen tones

Connection to sky: The ridge of the roof describes the point at which the structure ends and the sky begins. This point is articulated by an ornamented ridge.

- pitched roofs silhouetted against sky
- raised roof ridges to describe peak
- roof ridge is of a different material in contrast to roof material (cypress shingle roof Old Shoin)

Response to climate: The functionality of the villa's design is in direct response to the climate of Kyoto.

- thatched roof for ventilation
- raised floor removed from moisture / allow for ventilation under structure
vented gable ends to allow for continuous air flow  
deep overhangs to shade openings  
white walls to reflect heat from sun  
low lying vegetation surrounding structure for air circulation under floor

SPACE
Qualities of volumes: The interior spaces have a composition much as fine painting could be described in composition, balance, line, shape, repetition, pattern and harmony.

-light fragile appearance  
-no elements dominate interior in visual appearance  
-color is visually balanced in proportions to not dominate the visual perception  
-exterior structure translates to interior  
-movable partitions to create different size spaces  
-wall surfaces reflect proportion  
-texture defines surfaces floor / walls / ceiling  
-diffuse light through opaque windows  
-inner focus on activities within room  
-color harmonious with earth / nature  
-simple elements  
-verbal privacy is not a factor in design (cultural)  
-decoration minimal  
-applied ornament has no place in functionally responsive interior
**Space connections:** The interior is functionally responsive to various types of uses. It can be opened to connect to other rooms or soji screens can be moved to open to exterior spaces visually increasing the size of a room. This further connects the lifestyle to nature.

- majority circulation exterior walks
- soji screen partition rooms
- fusuma= sliding partitions that allow rooms to change size and be used for various functions
- framed views to exterior
- lineal configuration based on the tatami mats proportion
- repetition of elements wall panels, structural framing, soji screens, tatami mats allow for unification of interior spaces
- rooms based on module in Sukiya style / no proportion system in Shoin

**Hierarchy:** This element has certain meaning in the Japanese culture. It is identified by the possessions displayed on the shelves of the rooms. The Katsura Villa is identified as a palace.

- each room has certain purpose
- within room display shelf for possessions
- Shoin = main room decorated according to owners rank
Light articulation: Light is refined in the soji screen to a uniform light level at a particular location in a room. Shadows in the room are depleted. Light used especially in the circulation areas.

- diffuse light from exterior
- shadow cross room creating orientation of day
- soji windows maintain quality of light
- opaque window create inner focus

Special element articulation: There are three elements to the success of a Sukiya style construction. The architect, the craftsman, and the owner. Each has its responsibilities. The architect must plan for each aspect of design to reflect the owners wishes, the craftsman uses his own creativity for example he will carefully choose a piece of wood that has character and position in the composition that best allows it to express its character without compromising it. The owner has the responsibility of caring for the building and its maintenance allowing it mature as any piece of art.

- craftsman approach to all elements
- use of various hardwoods in articulation of shelves
- wood allowed to revile natural grain
- ornament minimal
- shelves most articulated
- wall surfaces tell stories in the painting applied to them
- detailed finger pulls on Fusuma (sliding doors)

Materials: The selection of materials is responsive to the local physical and cultural context.
- wood various types imported and local
- tatami mats
- cypress roof shingles
- stones from the Katsura River
- composite clay and fiber wall panels

OPENINGS
Reinforce spatial concepts: The openings provide a continuation of space either outdoors or to adjacent rooms.

-repetition of elements with in space
- proportions of soji screens vertical and horizontal
- repetition different along walks
- soji screen repeated along length of hall
- Soji screens moved to open into nature
the frame is the border to a picturesque landscape this allows the room to take on
different character that is closer to nature, an
outward focus in place of an inner focus

Hierarchy: The detail involved in the construction of a opening such as a door header
or the finger pulls tells of the hierarchy of the
inner space.

-placement of window appropriate to needs of
space the size of the soji is appropriate the
tasks to be performed in the space
-door header articulated differently in spaces
of greater importance

Framed Views: The placement of the openings
in a room is integrated into the exterior
landscape which allow for picturesque views through open soji windows onto colorful plantings, ponds or other structures.

- controlled framing to landscape
- controlled views to other spaces
- as if framing a photograph placement of line and form are manipulated

**Intention:** The intention is to provide connection to the exterior either through a opening or an opaque surface.

- opening has a clear connection to exterior
- opaque has a connection traced only by the sunlight passing through creating an increased inner focus to the space
- allow for air circulation
- provide light for tasks to be perform in space

**ENCLOSURE**

What is the role of mass? The mass of the interior is divided in several sub spaces through use of proportions of lines and forms.

- no furniture with in space to further divide space
- shelves, windows and closets create sub spaces as they break the four vertical planes of the room
- ceiling and floor heights divide into sub spaces within main space
What is the role of structure? The structure provides a visual rest and a communication to the viewer of how the space is proportioned and its function.

-structure is enhanced through its connections to other structural members and other materials
-it is in contrast to connected wall panels
-allowed to express its natural color and wood grain.

Materials: The materials that come from nature are so well crafted into useable forms they are left to express their origins. This further ties the interior to the surrounding landscape.

-Katsura shelves of different types rare woods from Southeast Asia
rosewood, ebony, Chinese quince, betel palm, kassod, Japanese horse chesnut, aloeswood, Japanese mulbery, white mulbery, Japanese persimmon, Royal paulownia, zelkova, cryptomeria, Japanese cypress and pine

Associated feeling: The feeling of tranquility and harmony of materials is achieved through composition of elements. Success comes the simple understanding of the space in its functionality, construction, and purpose.

-proportion systems provide justification in placement of elements and provides interest to the eye as it tries to figure out the proportions logic.
-elegance of quality and detail as it describes the elements
EMOTIVE QUALITIES

Atmosphere: The villa has an aura common to the Japanese imperial lifestyle of the 1600's. It is derived from the ritual of the culture. The Japanese tea ceremony is an example.

- space is functional in its purpose
- it is geared around the function of convenient living in harmony with nature and focuses the attention to the people using the space

Day to night changes: Focus during the day is outward into the natural surrounding, a harmony with nature. At night the focus is inward to enhance the quality of family life.

- reflection of moon of the pond is important for views

Symbolic links:
- Katsura tree
- mid-Autumn moon
- tea ceremony

AESTHETICS

What are the ordering devices? Structure and proportion take the role of order.

- Tatami mat size
  many rooms named for the number of the tatami mats used to create the size of the room
- Shoin "Kiwari" system of proportion from center of one post to the center of the
next post is the distance that all other proportions are taken from
-wall panels, structure, openings taken from the size of the tatami
-New Goten has no module
-largest module = structural framing
-smallest module = shelves

What gives feeling? The quality of the materials and their composition for a formal style of living.

-quality of light
-texture of various materials
-attention to detail and craftsmanship
-different murals on vertical surface

Corner connections: The quality of the craftsmanship and attention to detail both exterior and interior is expressive of the hand made qualities.

-types of joints
-detail of connects is purely functional

Material connections: The architect and the craftsman must have great knowledge of the various materials and their properties to understand how they can become connected.

-structural posts to wall panel
-structural posts to floor
-structural posts to ceiling
Climate with material considerations:
The use of light weight materials allow for ventilation from room to room. The moisture in the earth is solved by removing the floor surface from the ground as well as providing air circulation under the villa.

- wide openings from room to room for passage of air
- wide exterior openings for passage of air
- tall ceilings to keep hot moist air away from floor with some walls that do not reach ceiling for purpose of air circulation
- exterior posts placed on stone pads to keep moisture from rotting posts
Through the understanding of the components, which make the Katsura Palace successful as a historical example with which to base a further study, there must be an intermediate step to understand how the theory can translate to my thesis project of a modular home. This transition is a personal interpretation of the historicism that can translate to modernism which is commonly practiced by today's architects. This is purely to gain a better understanding of possible ways or theories that could translate or relate to a classical Japanese context. This interpretation ends before the design element of my physical design theories are realized in the modular home.
THE SHOIN AND THE SUKIYA:
TIME FOR A NEW READING

Historicism For A Translated Analysis Of Personal Interpretation
I have a certain attraction to the stylistic components of a traditional stick built Japanese architecture. It seems so simplistic and uniform in its existence. Simplistic meaning that it is easily understood in function, form and purpose. So, by trying to relate to this seemingly foreign style I began an analysis to start my thesis. I hoped by doing so I would be able to find answers that would forward my architectural knowledge and provide a basis from which to design. The example I chose to study was the Katsura palace which is based in the aesthetics of traditional Japanese architecture. It is purely based on the traditions of Japanese culture and context of the 1600's. This is what I believe to be pure and honest style. I began an analysis with several categories of the interior and exterior and then dove further into each to find the layers of success to make the villa work as a whole complex but remain in parts. However the basis for which each of these parts had no true meaning to me or where they came into being. The research brought up the fact that the palace had been created in two styles - the Shoin style and the Sukiya Style. Here lies the reason for which the pieces are tied together to make a successful whole. The Sukiya was mostly used in the Edo period (1603-1868). The Sukiya style was shadowed by the Shoin Style which dominated most architecture of this period. The katsura palace was created in a period of time in which the Shoin style of architecture, known to the imperial class, was becoming less dominate and the Sukiya style, known to the common persons class, was surfacing. This transition provided an interesting combination seen in the Katsura Villa. The Shoin style is known for its
symmetry. Symmetry suggests formality, completion and a static state. The Sukiya style is known for its asymmetry. Asymmetry suggests informality, incompleteness and movement while maintaining a harmony and balance. The Shoin style became ridiculed for its status of Imperialism that forgot the common class in government and expressed in architecture. Therefore, by combining or improving one through the other a common ideal could be expressed in the Katsura Palace.

To the educated Japanese person the word Sukiya evokes a number of associations with buildings in which the traditional fondness for natural materials, simplicity and closeness to nature dominates every detail of the composition. I believe the westerner, however, cannot be expected to share these associations. Although, the aesthetically perceptive person could grasp the ideals of the sukiya style and a certain fundamental knowledge about how it developed and about the philosophical concepts of its invaluable appreciation of the style.

The Wabi is the spiritual basis for the Sukiya style. It is the philosophical and aesthetic concepts that bring the Sukiya style into being. The word Wabi does not translate well and can mean a number of things such as, desolation, rustic simplicity, soiled and battered old things, quiet taste, a gentle affection for antique and rather melancholy refinement. (1 p.14) A literary example to illustrate the word Wabi is from a poem in the tenth century court anthology Kokin Wakashu:
As I awaken
to the sound of crying deer,
The mountain village seems to me
loneliest of all in Autumn.

The word Wabi is translated in "loneliest" to create a vision of quiet and remote mountain village in the somber beauty of autumn and to suggest sense of solitude evolved by the calling deer. The concept of the Wabi lends itself to narration according to the nature of the person viewing it. The Wabi of the tea ceremony and the architectural tastes is dark and sober. The Wabi of the Sukiya style houses of today is bright and fresh and can become an interpretation of the Spring season.

The word "Sukiya" literally means "tea room" or "tea house" and originally had to be either a room in a private residence or an independent building designed for the tea ceremony and floored with tatami mats to differentiate from the tea house. The term is called Sukiya-zukuri meaning sukiya construction of sukiya style which can include urban residences, villas, restaurants, Japanese style bars and art museums. These typically consist of natural shaped timbers, window alcoves with a broad sill (from the tea house tradition), bamboo poles that form the ceiling structure and the absence of decoration on the horizontal members called Nageshi are all elements not found in the Shoin style. The traditional Shoin room was outfitted with features such as window alcoves called the shoin -the reception room of the people of high classes, the ruling shogun, the feudal lords, court nobles, the samurai and ranking priests. The room had to be compatible with the master of the house. He
could not decorate his shoin more than his class rank permitted. Architecture with more and costly ornament is nothing more than a superficial spectacle, but abandoning decoration and designing architecture of simplicity is an extremely sophisticated and balanced sensitivity and sense of harmony. It is essential to remember that the sukiya building is not only a physical entity but also a process. If the people who inhabit the space are unaware of the proper way to use it or if it is abandoned and left to stand it first loses its luster and eventually falls to ruin since its materials are natural and will return to nature if left unattended. Since Sukiya building concepts constantly respect the spiritual attitudes of the inhabitants it becomes beautiful only when it is used. Sukiya demands that its architectural spaces are empty and that the inhabitants reflect their attitudes toward life in the way they use both functional and ornamental furnishings. There are three parties involved in the construction process. The client, the architect or tea master and the carpenter who erects the building. Each has their own responsibility to insure the success of the final project. The owner must understand his role of describing to the architect the wishes he intends for the uses and atmosphere to be created as well as the responsibility of caring for the building in order to maintain its original luster. The architect must be able to interpret the wishes and respond to the needs of the client, as well as, relate to the builder in order produce a product that can be called Sukiya. The builder in turn must have the knowledge to craft the ideas into physical state while bringing his own influences of craftsmanship and detail to the project.
As the Sukiya moves to the modern world it can still be expressed in its original concepts due to the fact that it is a philosophy and can be translated to any material, aesthetic property or culture. The industrial revolution made a wide scale factory production possible and flooded the modern architectural world with various construction materials such as, steel, concrete, glass and plastic. Even though the wall with exposed posts is now replaced with a wall that is covered on both sides and stucco has replaced clay and the Sukiya Style rooms are fitted into concrete and steel buildings and planning elements have altered the spiritual foundation of Sukiya can remain unchanged. Most of the construction work required for a Sukiya style building requires premodern techniques. The joining of the wooden framework is too complicated for machines and must be done by hand. No matter what material used, one must not violate the mood of the sukiya style. Anything that immediately catches the eye as one enters a sukiya style room does not belong. So, theoretically one could contrast a true sukiya style building of nothing but modern materials as long as it used the spirit of the style.

The selection of materials is still necessary instead of the modern form of specifying a brand name from a catalogue the selection should be made in person. Considering most of the sukiya style building is of wood for structure or finish material the selection should be made by the architect or craftsman just as his predecessors did. The westerner sees wood as something to process so that it suits his needs. The Japanese approach sees wood as believing that grain patterns, colors,
knots and textures of a log deserve as much respect as the features of a man made piece as an art object. The Japanese carpenter or designer spends much of their time in selecting the best way to display the natural features of the wood. The search for the aesthetic values is the duty of the Sukiya architect and an integral part of today's philosophy of sukiya. People want the Sukiya style room for the sake of the spiritual elevation to be achieved from the intimacy with such traditional arts as those of the tea ceremony, flower arrangement and classical Japanese music and the aesthetic pleasures gained from the sukiya setting.

To translate this into a modern style that can be responsive to ideals or philosophy of the Sukiya and Shoin styles is the next step to obtain the desired knowledge of examples from the practice. I have selected several architects that could be said have the same ideals or similar philosophies of the Sukiya style architects of the past. These architects are of western influence are not related to the sukiya style or any Japanese styles, but can be compared for the purpose of gaining a personal understanding of what I believe to be Sukiya style. The four architects that come to mind are Mies van der Rohe, Richard Meier, Frank Gehry and Eunice Fay Jones.

Mies van der Rohe is a fine example of the attributes of architecture as a philosophy based on a level of understanding the spiritual level which can be translated into a Shoin ideal of proportion and design that lies in the design of simplicity and sophistication to create a beautiful object. Mies believes that "structure is spiritual" and a believer in architectural
truth. For example the Segrals building uses a curtain wall with an applied l-beam to stress the vertical and together with the spandrels form a narrow metal grid stretched over the surface of the building. This symbolizes the broader structural grid behind it (in which the structural l-beam must be covered with concrete) and gives the building the sculptural presence of the Chicago School and the modernist facade is maintained. The building is also very symmetrical with its entry on the central axis of a five bay system of structure and the vertical is repeated to for a continuous proportion. The plan is symmetrically proportioned into bays 27'-9" square, 10 squares from front to back and 7 side to side. This determines the placement of the piers of each bay and then it is further divided in 6 by 6 modules that define the space of the paving stones, mullions and almost all the other elements. (2 p.540) It can be said to be a modular building such as Katsura which is based on the tatami mat as a proportioning system that is carried throughout the design elements. Each are divided into major and minor grids and the total harmony is maintained.

The "less is more" theory of Mies could also be used to describe the theory of architectural design that is pure with out applied decoration and describes architecture of simplicity that is sophisticated with a balance of sensitivity. I believe an example of this is the Barcelona Pavilion. Here simplicity is the strength. The plan, elevation and use of materials with their craftsmanship and attention to detail provide the richness of the design aesthetic in a simple expression. The domino grid in its expression provides the ideals of visible security for the
seeming floating planes as it is expressed in the wall plane.

"Gehery's buildings are perfectly modern. As a part of the chaotic field of a modern metropolis, they only represent the act of making, and are thus vulnerable to the continual growth and decay. As ephemeral markers they designate the self-facing path architecture takes as it articulates everyday life in the age of modernization. The end point of architecture and art, they suggest, it is not one of reductive abstraction, but one of merging architecture and the physical world. In this process, the architect's role as one of asserting how perception, knowing, and making interact to de-form and re-form reality." (3 p. 49)

-Aaron Betsky

From this the translation can be tied back to the ideal of caring for the building and the level of construction brought to a unique piece of crafted architecture and if it is left unattended it will revert back to nature or in this case decay of this form of making architecture in the modernism. And realizing that art and architecture are one in the same and both have place in the building such as the artistic side of the sukiya can be placed on the more straightforward side of architecture of the Shoin style. He also realizes the importance of the expression of man's influence or craft on an object. For example, the wall in the process of construction is covered with sheet rock and the structural expression disappears. By stopping the process after the joints are typically tapped and covered with joint compound and before they are sanded to a machine finish, the wall is
able to express the man made process and the craft involved in an ordinarily mundane practice. The lines that remain also inform the viewer of the structure behind the cover.

"To design for minimal construction, by defining only the line or outer physical wall, and let the user define his own space and make it an intimate part of himself, so he will develop a relationship with the architecture... it is important to design a flexible space."

-Frank Gehry

This statement has connection with the translated philosophy to say that the people that inhabit the space can make their space become beautiful if it used in a respectful way to the intention of Gehry. Such as the previous statement of the Sukiya that demands its spaces are empty and that the inhabitants reflect their attitudes towards life upon the building.

In learning how to identify the ideals of the understanding of the Katsura palace I can contrast them against the work of Richard Meier to strengthen the theory. For example, he believes there is nothing natural about a house, as soon as a piece of wood is taken from a tree, it is no longer natural. For him the ideas of trying to make a house, or any other building for that matter, appear natural is a concept he wants to avoid. Any built object is artificial and the best way it can respect its surroundings is not through superficial mimicking of romantic attitudes about nature, but in expressing the integrity inherent in the building itself which, by definition, places it in direct opposition to nature. Therefore, the importance
of maintaining the level of craft of the Sukiya and to highlight the properties of a certain element such as a log can further divorce the theory that anything man made is not natural, therefore artificial and being related to a machine process.

However, as far as maintaining a theory of Meier's that could be considered linked to the Sukiya is the philosophy that he has the white planes of the vertical surfaces act as a backdrop for the people that use the space such as in the Museum of Modern Art project in Florence, Italy. Here the colors of the people and their dress provide life to the seemingly lifeless and blankness feeling of the building when not used by humans.

Eunie Fay Jones also has a relationship to the understanding of architecture that involves a spirit that can be translated to the Japanese philosophy. As Fay Jones was an apprentice to Frank Lloyd Wright, who has a strong connection to the traditional Japanese style, Jones has brought his own understanding of the principal of creation and the essence of nature, life and existence. The honesty of materials is an important part in the success of the finished product. The nature of materials in architecture is an understanding of the principles involved for that particular material. For the appropriate use one must understand the materials attributes which contain the visual stimulation as well as its physical abilities and limitations. The detail the building receive is a part of the structure an integral to the design. I believe is the Crosby (Pinecote) Pavilion in Picayune, Mississippi is the best example of this. The attention also is focused on the
interaction to the site. Fay Jones believes that the structure should bring something to the site that improves it and becomes enhanced by the architecture. The idea of a shelter and its properties is simplistic in idea but can be articulated in the detail to bring a richness to the site such as use of light - shade and shadow manipulation of view and air circulation common to the properties of the Katsura Palace.

From these examples it is possible to gain an understanding of the theory necessary to continue a personal philosophy that can be considered of Sukiya style influence. A translated philosophy that can be applied to any project. A philosophy that respects the nature of materials, how craft of the man made objects is to show process, respect for the occupants of the space, an understanding of how the space is to be used to create an aesthetic, the bigger picture of what the building becomes when used, an understanding of the relationship between client, architect and builder. A philosophy and understanding that can continue to develop as more knowledge is gained.


2 Trachtenberg, Marvin. Architecture, from prehistory to post-modern / the wester tradition. Prentice - Hall, Inc. New Jersey. 1986

TRANSITION

From the understanding of the intermediate stage of transferring the Katsura Palace analysis to a modular home it is now possible to begin the design of my personal theories realized in the thesis.

The actual thesis project, the modular home, as realized started with details which I believed to the foremost important to explore. From the beginning analysis I believed the details of Katsura or any classical Japanese structure so rich in its seemingly simple elements and components as a whole. The understanding of material connections, use of contrasting forms and properties of materials in their particular use is important to create a successful detail, as well as, the understanding of the transfer to the larger scale containing the details. Therefore, the aesthetic beauty of Katsura comes from an intimate understanding of detail. By beginning with details in my thesis and setting aside the larger scale until later my intimacy with connections and material properties became a focus and theory to designing the components of my home.
FURNITURE
I began by looking at what makes a home a home. This is an inner focus on the activities which take place within the home. "family activity" The shell or exterior is unimportant for this concept and is reduced to only the idea as a shelter at this point. The people or occupants of the home become the lifeline and can be expressed as life only when the object is used. How the pieces are used creates this relationship of person and object architecture. To realize this concept I looked at furniture design which is the most highly interactive object of the person within the home. By using a modern term ergonomics (responsive to the needs of the human body and associated conveniences) which is similar to Japanese ideals of functionality can be translated to their theory of limited furnishings to allow the space to be used for various functions. In today's society the functionality of furniture is necessary as an object not simply space. Therefore, the furniture piece creates a sub-space within the larger space and is permanent to that space allowing that space to be labeled according to its function. For example, the dining room is known for the functions of eating and its associated activities such as conversation. This is opposed to the Katsura complex which simply labels as a 6 mat room. Which means the room is composed of 6 Tatami mats approximately 3' by 6' each and its function variable.

The furniture of the dining room is responsive in form by allowing an elongated rectangle based on the 3' by 6' floor grid to make a four person table. The two heads of the family (husband and wife) a seated at each end of the rectangle and
the children or guests are seated to each side. This allows for the family structure to be expressed in the layout of a rectangle. The table is the expanded by a convex curve along the two sides to open the middle of the table for the center piece and service dishes easily accessible from all four sides. This also allows for the children to be move outward on the convex curve and strengthens the relationship of side to side on a different line, as well as, strengthening the end to end connection of a different line. Another functional element to the table is a drawer below each side which contains silverware, dishes and napkins for convenience. The detail of the square legs of the table are tapered at the two outer facing sides away from the seated person to oppose the straight vertical line of the wall plane and the two inner facing edges are straight vertical to oppose the natural form of the human leg. As these legs touch the floor they are returned to the modular grid (described latter) by a square block to stop the motion of the taper and further return the table to a resting place on the floor within the grid. The detail at the top of the leg is seen as it penetrates through the top of the horizontal plane and is realized as an inlayed piece flush with the surface. These four squares on the surface further proportion the plane into the four spaces of each user. Along with an inlayed strip of thin stainless steel line connect the four legs and provide a datum as a reference to the 3' by 6' grid of the floor, as well as, a reference for the curvature of the two sides. This line also highlights the proportions that mark a 1'-6" by 3' space for each person to tie these four positions together. The aesthetic responsibility is in the details and their articulation of the hard wood.
horizontal plane and steel legs and seem through their use of functionality. But, as mentioned earlier asymmetry provides the interest as it deviates from symmetry. Therefore, a simple checkered pattern is inlaid to the surface of the table at one end and set to the side. This describes the head of the table at one end and is set to the one side to speak of the oldest offspring to identify their place at the table and within the family structure.

When looking at the bedroom of a husband and wife this provides a duality of two people sharing a space and having their possessions shared and also being able to express each individual. The bed, being the most important part of the bedroom, provides many opportunities to express this duality. First the male and female sides of the bed are expressed by symbolic means. These means are a functional support for a shelf which further describes each individual. This shelf contains the personal objects of each person such as a lamp, photograph, magazine or alarm clock. The way each shell is supported is the description of the individuals sex. The male’s or phalic side is expressed by a crane like projection extending from the center point of the bed and tapering off out past the edge of the mattress. A fine tensile cable then supports the horizontal plane of the shelf as it cantilevers out from the edge of the head board. The female side is described in a more elegant form of the circle and curve. The curve is used to support the shelf from the under side as it cantilevers off the headboard which is a horizontal rectangle with a circle inscribed in it. This plane is closest to the front or head of the bed. As the two sides are separated by each property of the
individual a contrasting curve is introduced to unify the sides. The contrasting second plane is set behind the first and connects the male and female sides. This symbol is an arch. The arch represents the time of sleep in the universe. A night to day transition providing the arch with either the meaning of a falling moon to put one to sleep or a sun rising to greet one in the morning. The details of function and form as each is separated and combined along with the strength of the contrast of asymmetry vs. Symmetry provides the aesthetic. Again the bed is proportioned in plan as the head board is 1'-6" thick and the mattress is 6'-6" long which returns the entire bed to a proportion on the 3' by 6' grid.

In the office a highly functional work place is desired for an ergonomically correct layout for convenient operations. By taking this idea from the professional environment and translating it to a scaled down home work place for computer operations (specifically CADD) provides the opportunity for a single piece of furniture that combines all the operations of a work station. Functionally the table is the standard 1'-6" high so a standard comfortable chair may be used as it is easily moveable and adjustable for the user. Thus, allowing the key board to be moved around and possibly set in the lap of the user while the users feet remain on the floor or kicked back upon the desk. The monitor is set directly on the table in the one corner under the shelf. The disk drive is set off to the side which allows the viewer to look down upon the screen in a more comfortable and natural position. The cantilevered shelves above the table allow for the display of any inspirational objects or ready reference material used on the
project or to enhance the space with a natural object contrasting the technical atmosphere. These shelves, as well as, the surrounding storage devices allow the table to remain uncluttered and functional. Below the disk drive there is a simple drawer for the typical office supplies. Below this is file cabinet. Above this set is a book cabinet with three shelves. These are set behind a door of opaque glass which, much like the soji screen, allows for only faint images to be recognized as a book shelf. Next to the cabinet are the drawing files which hang on the racks. These are the most recent projects. Below this are the rolled drawing files of past projects. In forms the table and shelves are supported by the mass of the cabinet structure and pulled out to provide the user space. The sub-component is the vertical structure to support this space. These are the thin legs asymmetrically set to support each shelf and the legs of the table are again ended by a square block that return the system to its place in the 3' by 6' grid. Tensile wire provides the triangular cross bracing for the table legs. The aesthetics again rely of the functionalism and detail expressed within the connection of pieces. The asymmetry of forms provides interest as does the contrasting curvilinear inlayed stainless steel line proportioning the table into the space for the monitor and the space for the keyboard and its intimate connection to the user.

The living room provides an opportunity to express many functions variable to the amount of people using the space or the many uses at one time within the space. The sofa best exemplifies this space in furniture forms. The sofa design for this space must be practical for
these multiple uses while creating its sub-space with in the larger space. The living room is an informal space centered around conversation and relaxation. Therefore, the function of the couch is to provide a place for conversation and a space to stretch out. These spaces are allowed to overlap. When looking at a conversation grouping the ideal form is a L-shaped configuration. Therefore an eye to eye contact can be made with only a slight twist of the head while remaining in a close position to one another. (as opposed to standing opposite each other for eye contact but being removed from the same structure) This furthers the idea of togetherness. However, when sitting shoulder, such as in a typical love seat, conversation is complicated. The function of the L-shaped sofa on one side is love seat which is counterbalanced by a concave curve to allow the two people to face inward toward each other. Thus, allowing another degree of intimacy. When more people are seated the L-shaped configuration is used and each person is allowed to face one another. The one leg of the L is tapered at a slight angle and its back rest ends on the 4'-6" mark to describe how the upper body is larger and better protected by the back rest when lying down. The foot end is then narrower and allows for the feet to extend off the end of the sofa. Therefore, describing the multiple uses interpreted by form. The structural planes at the edges of the sofa, which also serve as the back support, return the divided forms to the grid of the floor plane and the wall plane. They also further create the sub-space within the room. Another functional component are the drawers below the cushions and within the structure for storage space. The aesthetic is in the detail of the connections of
the structural planes that tie to functions such as the arm rest layed into the plane or the plane of the feet structure which extend past the plane to show their connection. Aesthetics also exits in the asymmetry of the lines of functional components balances by the structural planes. The height is 1'-6" at seat height and the top of the back rest is 3'. The plan is taken from the 6' by 6' square with a 3' by 3' square removed to create the L- shape. The asymmetry is then provided by the functional needs of the sofa.

**MODULE**
The pieces of the module for which the structure is to be constructed and shelter the occupants is now the major concern. The inspiration comes from Katsura. Katsura can be explained as an early form of modular construction. The system of structure is based on a proportional system both horizontally and vertically, therefore, the wooden post and beam construction is standardized and processed at uniform lengths according to the purpose. The wall panel, of clay and fiber, is inserted into the standard openings. Or, a soji screen, window openings and interior partitions are also on this standard grid. The detail of the jointery is then the concern for the success of each material to be connected to a similar or unlike material.

This idea translates easily to my concept of modular housing in a modern society. My modular home uses a system translated into modern materials and responsive to the climate
of Northern America. I have divided the the structure into three systems: the ground plane, the surround plane and the overhead plane to describe the function of each responsibility in the overall shell. The ground plane exists as a 3' by 3' waffle like grid that covers the ground and allows the surround plane to be attached to it. This is much like Katsura ground plane the is raised off the ground to allow for ventilation under the floor due to the humid climate. The waffle grid is 3' thick and allows for the mechanical system to pass through and appear at any place on the surface of the structure. This duality of structural support and mechanical systems space allows for functionality and flexibility. The grid can be expanded as necessary. Another similarity to Katsura is the detail of the post being set on an expressed stone foundation. The waffle grid structure, likewise, is set on a flared footing when it touches the ground. This structure is flexible enough to allow for custom functions described by the site. For example, the addition of a reflecting pool recessed in the grid and the placement of the necessary mechanical systems with in the structure. Or, the ends of the structure, for this particular site on top of a twenty story building (site explained later), extends 6' past the roof line and a detailed system with a winch is used to move a window washing platform up the side of the building as it hangs from the structural grid. Air intake and exhaust is received through panels throughout the surface in the exterior gardens. This uniform structural grid allows the random structure of the existing building to support the 3' by 3' grid independently without adapting it to meet a specific existing structure.
The surround plane is then added. The vertical structure is put in place at standard 9' heights at 3' to 6' on center increments. This is a 6" by 6" square hollow steel tube which is articulated to hold a 6' sandwich panel. Where the wall is increased in height, such as, at the gable ends or higher back walls, an adapter is added in 1' -6" increments. The horizontal structure is then added between the posts. This also is a 6" by 6" square steel tube. This structure occurs at 3', 6' and 9' heights on the standard wall. Its placement is determined by the 3' by 6' wall panel that is used to proportion the facade and its placement is determined by the function of the interior. Particularly if the space is vertically or horizontally oriented.

The sandwich panel consists of three layers. The exterior layer provides protection from the weather. This is a steel or plastic surface of various colors. It is then backed by a structural steel plate to provide triangulation for the surrounds structural grid. The middle layer is separated by an air gap to each side. This is the insulation and vapor barrier. It is attached to a thermal break in the structural steel tube. The interior panel is of a softer material that is textured on the outer surface and is backed by a rigid panel to provide support and an acoustical quality. Each panel can be removed individuality due to damage, ware or color considerations and replaced with a different panel. This flexibility responds to a changing life style or updates in the quality from the manufacturer. The flexibility also exists as it pertains to a different furniture arrangement. Window panels are also placed within the grid and again associated with the function of the interior either top light or a full 9' high to fill the room.
with natural light. Interior partitions exist in the same manner with T-shaped connection adapters or corner connections. A flashing system of a thin rubber strip is attached to the structural tube and covers the joints.

The roof plane exists as a shelter. The structural beams and trusses are placed 3' on center and a system of lighter supports span the 3' intervals to carry the skin of the roof. The interior ceiling plane can be covered on the lower chord of the truss by a similar panel system when the room desires a low ceiling height. Or, the trusses can be left exposed to have a loftier space. A tensile cable can also be used in place of the lower chord for an uninterrupted vertical space. The upper chord is the thickest member to allow for insulation and air space. The metal roof deck is then attached to the exterior of the upper chord. The roof overhang is typically 1'-6" and is tied with tensile cable to the extension of the structure in the ground plane for high wind design considerations common to the site.

The grid is typically used to proportion the interior functions and set the asymmetrical and free formed objects such as plant life and the human form in contrast to the grid. I believe this contrast strengthens each component. The modular grid and the interior object is highlighted in its context. This is compared to the Shoin style which is formal and equivocal to this modular structure in its simplicity formality and completion. The sukiya, on the other hand, is known as the more artistic and asymmetrical which equvalates to the informality, incompleteness and movement.
examplified in the furniture's forms, plants and people which bring life to the interior. This is the aesthetic quality brought about by the concept and its realization in the details of this duality. The duality is then tied back together through the lines of influence of the proportioning system primarily in the floor plane and wall plane. Each piece exists within this grid and is articulated around each piece and function of the piece further creating sub-space with each line of influence. The natural forms of a plant, human or curve then receives importance as they are in contrast to the ruling grid. Life is then articulated and brought into the room when it is used in the correct manner that is respective to the set ideals as in Katsura and the Sukiya lifestyle.

Now that the furniture is designed for each major room and a structural proportioning system is established the modular pieces can be assembled to create spaces responsive to the necessity and function of a home for a family of four. The space is designed around each piece of furniture as well as responding to the adjacent spaces confined to the grid. The process can be seen as an assembly of modules or rooms connected to create a floor plan and elevation. Several other considerations are set to form the floor plan. The concept of an increasing hierarchy of privacy as one enters the home is set. The second is the circulation within the zones. Each is divided on an axis. The axis is then terminated by a focal point or a functional point. Sub-axis are then laid over for access to each space off the main axis. I explain this procession as one enters this particular home through the use of a visitor, named Chip, who is comming to the home for dinner. (see appendix
for plan and elevations) Chip would enter the apartment complex on the first level and stop at the front door. Here he could ring the phone of the home. I would buzz the front door so he could enter. This is primarily a security consideration for the tenants. This is the equivalent to the first gate at the Katsura Villa complex. Chip would then proceed through the lobby and to the elevators. He would then ride the elevator to the 20th floor. Next, he would enter the door to the stairway of the lower foyer. Here is a gate. Chip must again ring the bell. I would come out on to the foyer above and have a direct line of sight to the gate. Another security measure comparable to Katsura. As I buzz the door to let Chip in, he moves up the stairs off axis to the square grid. This is comparable to the walkway of Katsura which provides prospective views of the structures as it moves diagonally. The stairway ends with a view of the Tokonoma (Japanese shelves used to display the possessions of the family to identify its social class). When in the foyer a view is continued in each direction. Included in these views are: one to the formal garden, one to the office which has an open corner to let the view extend diagonally through the room appearing to increase its size, a view down the long axis and out to the Pagoda with the lake beyond and in the opposite direction is a view into the living spaces. This is the most public or semi-public part of the home. In a typical home the living room is used primarily for entertainment on limited occasions. By eliminating it and reducing it to its pure function the living room becomes a simple conversation nook. This is in a U-shaped configuration for ideal interaction. Chip is then invited to eat dinner by moving down the long
axis past the kitchen to the dining room. At the end of the axis is a nine foot tall vertical window which extends the axis to the city view and its formalism dictated by symmetry in this direction (seen in the west facade). The dining room, being a sitting space, has the lines of influence oriented in a horizontal direction with a horizontal window. After dinner the guest, Chip, is then ready for transition off the semi-public axis and crosses into the living room. This is a more informal space where one can relax and act at ease while enjoying the views of the city extended out on to a secure balcony set in the center of the facade. Chip is then invited to the private axis which lies past the three foot thick passage which contains another Tokonoma that describes this privacy. As he enters at one end, the view extends out to the lake side. This axis is flanked on one side with bedrooms and the other side with an 18-foot high wall. Repetition is used in the floor, wall and ceiling trusses to create a pattern and proportion of the linear space. The view, as it moves out past the tall glass window at the end of the hall, crosses a reflecting pond set off axis. This relates to the angle of the shore line and is directed toward Lake Shore Drive. Past the pond sits a statue set in tension and extended out on a diving board-like platform. This is in contrast to the secure balcony overlooking the city grid. From this point on the insecure balcony Chip can see out past the corner of the adjacent condominium and look to the city of Chicago to the south. On a clear day one can see Navy Pier. This statue is dedicated to the human form and its elegant balance within nature. It is backdropped by the horizon line of Lake Michigan and the sky to the east. This patio is informal and asymmetrically
configured to allow for functions of informal entertainment.

SITE CONTEXT
The selected site which to test the thesis project is 20 story condominium north of the city of Chicago. This building is on the corner of West Ardmore and Sheridan Avenue. The actual site is the roof top of the building which is approximately 190 feet above the dense urban context of this neighborhood. The site was chosen because of its unique properties that lends itself to comparisons to Katsura and the possibilities of a unique lifestyle. The Katsura Villa complex was used as a residence for the entertainment of Japanese nobels. The site allowed the to escape the city life and retreat to the beautiful landscape of the complex. This site, on the roof, allows for an escape of retreat from the city below as it occupies the air space once unused by the condominium. I see this as an escape to nature. A nature not of the landscape common to the ground but a nature common to the sky. Thus, the need for response to the many views. The site is set on the lakeside of Sheridan Avenue which provides views east to Lake Michigan and the beauty of its nature. The beach stretches north and south to the horizon line. Opposed to this are the views to the west of the dense grid of the urban fabric of buildings and residential neighborhoods. To the south is the city of downtown Chicago. However, this view is partially blocked by an adjacent condominium. To the north is an uninterrupted view of the towns further north of Chicago. These towns are primarily residential.
This particular building was chosen for its style. The condominium is an international style building done in the 1950's. Its flat roof allows for the addition of another structure. As typical international style buildings are known to have no end as they reach skyward, due to the fact that each level of the facade is identical to the one below, this provides the opportunity to add a termination to this movement. Another unique reason for the selection is the fact that the window mullion separation is 3 feet on center and the height of the window is 6 feet (the size of the tatami mat). However, the structural grid appears random in its placement.

Overall, this site is in contrast to the climate and natural beauty of the Katsura Villa complex. This provides the opportunity for me to interpret my analysis of Katsura to a unique understanding of the properties of the aesthetics of structure, plan and details which make Katsura successful.
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