



## Fabricating Space through Weak Architecture:

An examination of the process of spatial and material fabrication through the parallel practices of architecture and dress design

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Carl

To those who keep giving but never receive.

“fashion is architecture:

it is a matter of proportions.”

-Coco Chanel



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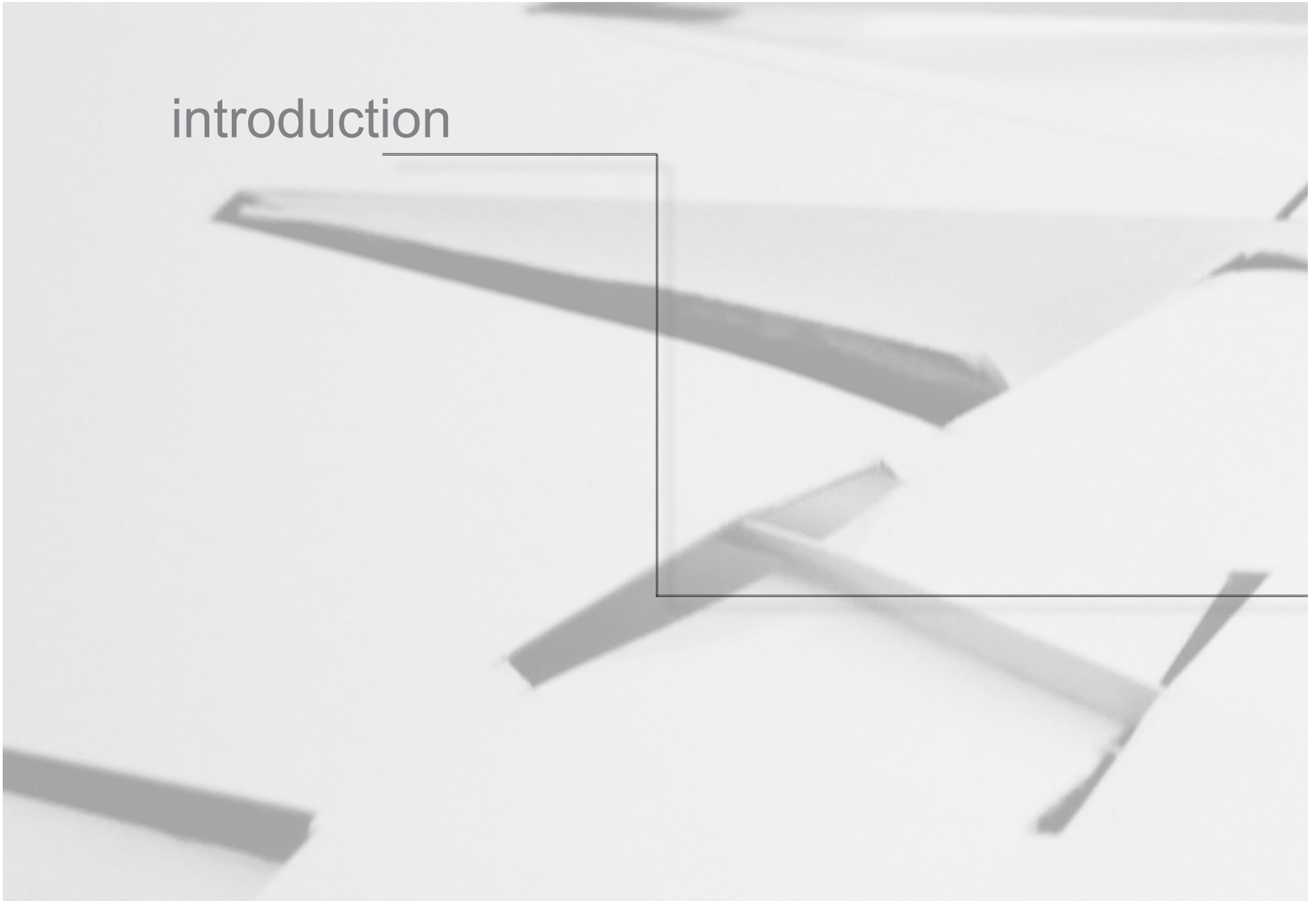
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“The signified is not constructed by means of an order but by means of pieces that may ultimately touch; that approach one another, at times without touching; that draw nearer to one another yet never make contact; that overlap, that offer themselves in a discontinuity in time whose reading as juxtaposition is the closest approximation to reality at our disposal.”

Ignasi De Sola Morales, “Weak Architecture” (Lynn 621)

# introduction











## parallels and links

The link between architecture and dress design is vivid but unexplored. A recent article in Moca Grand Review expresses the connection between these two fields as a symbiotic one, stating that, “Both garments and buildings protect and shelter the body while providing a means to express identity.” (Moca 2007) Consistently, both disciplines start with the human body and expand on ideas of space and movement, serving as outward expressions of personal, political, and cultural identity. Architects and dress designers produce environments defined by spatial awareness. The structures they create are based on volume, function, proportion, and material. The following research is an effort to examine and tighten the connection between these two forms of design with the hope of forming and shaping the next emerging architecture.

In Bradley Quinn’s, “The Fashion of Architecture,” there is a brief description about the Fluid Form that discusses a close relationship between dress design and architecture.

He states,

The laws of gravity and human proportion dictate that a building like a garment should be assembled according to certain rules. Fashion designers also interpret clothing according to spatial limitations, their construction skills paralleling those of an architect or an engineer. Both fashion and architecture revolve around existing form, and therefore require an understanding of mass as well as space.

(Quinn 206)

This thesis is an effort to construct a unified process of design, using the techniques of fabricating dress and architecture.



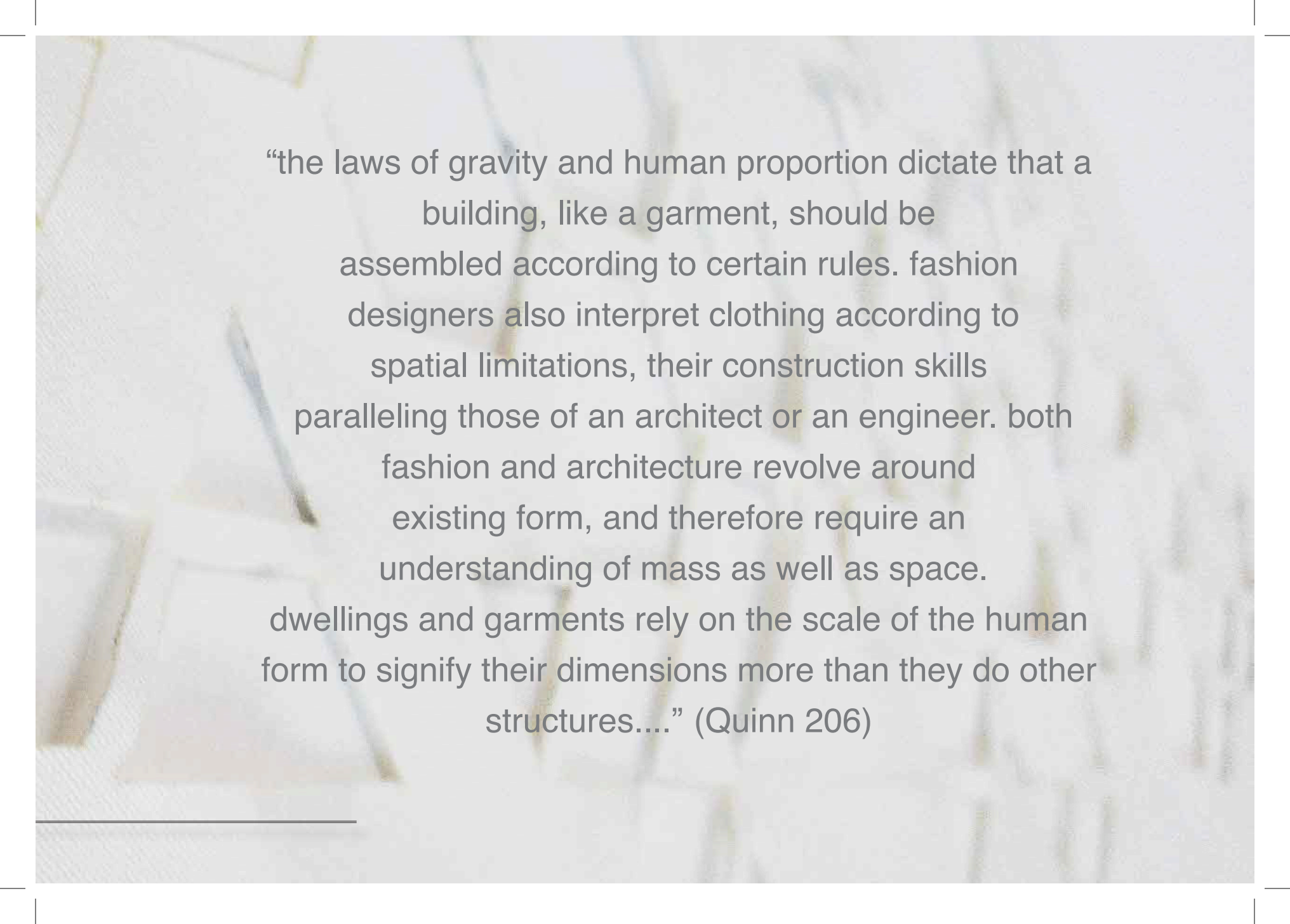
## purpose

This project investigates material and spatial design through a process of analysis and fabrication. It approaches architectural space in a non-linear fashion, deconstructing the process of making and translating it into occupiable space in a manner similar to “Weak Architecture.” “Weak Architecture is defined as a way of designing that is based on production, tectonic density, and constructional rigor. (Lynn 614) This design process is also related to the idea of “archeology,” which Jacques Derrida and Ignasi De Sola Morales define as a system of interweaving languages. (Lynn 620) I am referring to the languages of architecture and dress as they pertain to this design process and the development of a different way of thinking.



# experimentation with fabrication

scale + material



“the laws of gravity and human proportion dictate that a building, like a garment, should be assembled according to certain rules. fashion designers also interpret clothing according to spatial limitations, their construction skills paralleling those of an architect or an engineer. both fashion and architecture revolve around existing form, and therefore require an understanding of mass as well as space. dwellings and garments rely on the scale of the human form to signify their dimensions more than they do other structures....” (Quinn 206)

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Experiments with dress design :: A series of dresses were fabricated that expand on ideas of scale in relationship to the human body.

Left :: Designed utilizing an idea of extruding structure from female body while still emphasizing the many features of the form



## scales of fabrication

The idea for this project developed from an infatuation with a personal pastime, dress design. I have been experimenting with this form of fabrication for many years. The process of construction utilizes many techniques and ideas parallel to architecture.

The Physical analysis began by constructing a series of pieces that analyzed architecture and dress design at the scale of the body. I began fabrication by physically designing in both fields, constructing two parts of one whole. I began fabricating along the scales of dress considering I had a previous knowledge of architectural design. The process started by manipulating fabric in a structural manner to compose a set of guidelines that would influence my process and research.

Constructing a series of dresses and drawings I expressed general ideas of material, structure and space around the human body. The first experiment was designed utilizing an idea of idea of extruding structure from female body while still emphasizing the many features of the form. Throughout this process, I began to form ideas about the space of the body and its reaction to material. The many proportions of the form held within them the opportunity to be addressed, emphasized or de-emphasized in a particular manner. Manipulating the form of the body is much like manipulating space through architecture. The only difference being the overall scale.

Scale played an important role in the development of this project. Addressing different scales of fabrication allowed the project to develop the idea of material.

Additionally, this exploration became vital because it allowed for the opportunity to understand the dynamics of pattern design. Learning to construct patterns juxtaposed against different scales of the body provided for a new way to physically manipulate and structure space.



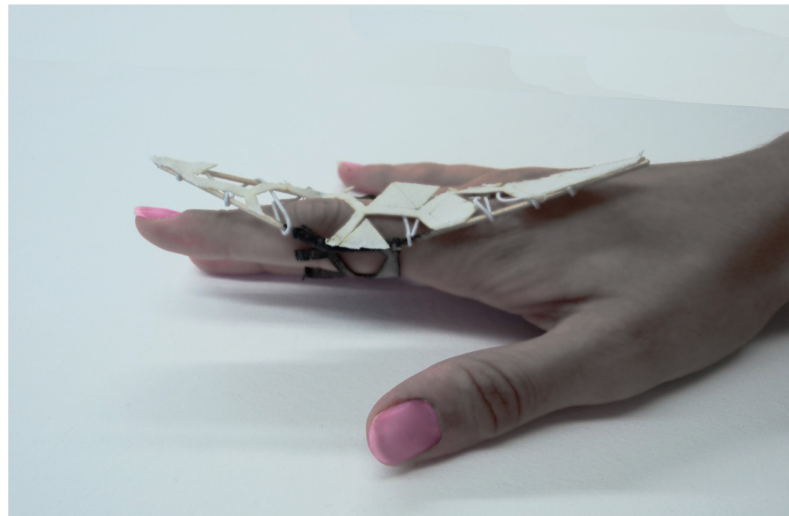
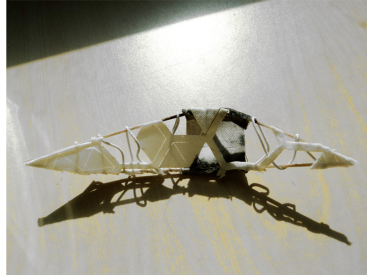
## scaling material

One of the original concepts of this project was to construct a design that existed at numerous scales. This decision was made as a result of the scale shift that occurs in the analysis and fabrication of dress and architecture. As a result, throughout the process of this project, the fabricated experiments shift in their expression of scale and occupation.

After a first pass at dress design, I addressed the cloth itself. In an effort to understand how a dynamic unit such as fabric can be manipulated to address new ideas of material and scale. Operating with a triangular pattern generated from the deconstruction of film from a previous project (left), I scored and cut the pattern into cloth. Used because of its ability to shift scales dimensionally, the new material was participated in the construction of an object that addressed the scale of the human hand. After learning the basics of cloth construction, the next step in the process was an exploration of material and its reaction to scale.

## measuring the hand

This process continued to test the boundaries of scale in the form of a construction measuring the space of the human hand (right).



**the smallest scale** Utilizing wood and laser-cut cloth, this piece emphasizes the joint of the finger, pushing away from the natural movement of the bodies smallest scale.

Utilizing the patterned fabric, I expressed the dimensions of the hand, starting with the joints of the fingers and knuckles, continuing to the small detail of the nail. The hand is an important scale factor in both architecture and fashion, acting as a measuring tool with the ability to drive detail of and along with design.

In an effort to express the dynamics of the finger, I constructed a piece that juxtaposes itself against the joint of the index finger. This unit expands towards its center and compresses as it moves outwards, emphasizing the importance of the joint. The piece was constructed from basswood linear elements that became the structural frame. The cut and scored fabric was then stretched over this frame and wrapped along the joint of the index finger. Thin pieces of lightweight, elastic string allowed the object to react to hand movements. Towards the tip of the finger the cloth is cut to expose the joint. The opacity of the constructed fabric was also considered. At the base of the finger near the wrist the fabric began to become less permeable to express the different function of the next joint, the knuckle.

This experiment, allowed me to address the small scale of the body, concluding that movement through an architectural object is inevitable. Creating a piece that both

expressed and spatialized this movement was necessary to form an idea of how to construct an object that could operate a different dimensions, large or small. This unit became a measuring tool that had the ability to drive detail and design ideas as they relate to function and scale .

## material in parallel

Architecture uses a wide range of materials that range from glass and concrete to cloth and wood. Texture is very important to scale, structure, and design for both architecture and dress design. Cloth texture can affect material strength and help or hinder structural qualities. In addition cloth has the ability to move, flow, and create space.

In architecture, texture can change the way that a space is perceived and occupied, it can address the human scale or create privacy. Texture materials can be formed in concrete castings or laser-cut in fabric. Dress design has adapted many organic materials to create clothing that is both spatial and functional. African cloth materiality ranges from popular textiles such as cotton to less obvious materials like foliage. Through time clothing has been woven from plant matter. This idea of using organic material has even appeared sporadically in contemporary dress design.

In architecture, foliage has been prevalent in the construction of space just as it has in dress design. While couture architects may not be as liberal with the integration of plant matter in their building facade, opting for more popular steel and concrete constructions, tribes in Africa such as the Kung Bushmen still use these materials in the construction of their dwellings. On the outer edge of a complex stick skeleton grass materializes itself into a dense skin that shields and comforts occupants. (Oliver 22-23)

Cloth, unlike plant matter is used as a material in contemporary architecture. This versatile material is used for its ability to express form, in the same way cloth is manipulated in dress design. Present-day architects like Shigeru Ban, have used cloth in many constructions. In the “Curtain Wall House” Ban uses cloth to redefine ideas of privacy and exposure. (Hodge 53-54) In other African nomadic cultures cloth has been used in tent systems. Black tents of the East Arabian use strips of cloth that have been sewn together to create the exterior membrane of their tent dwelling. (25 Dwellings) Conversely, dress designers are now fabricating corsets and petticoats from wood and steel, materials primarily used in architecture. Innovations with dress design and architecture have redefined the definition of material, extending beyond stressing ideas of privacy and aesthetic, emphasizing new ideas of space and occupation.



Hussein Chalayan's fabricated wood dress piece (Hodge, 13) :: top

Shigeru Ban's, "Curtain Wall House" (Hodge, 54) :: middle

Shigeru Ban's, "Curtain Wall House" (Van der Plas, 8) :: bottom



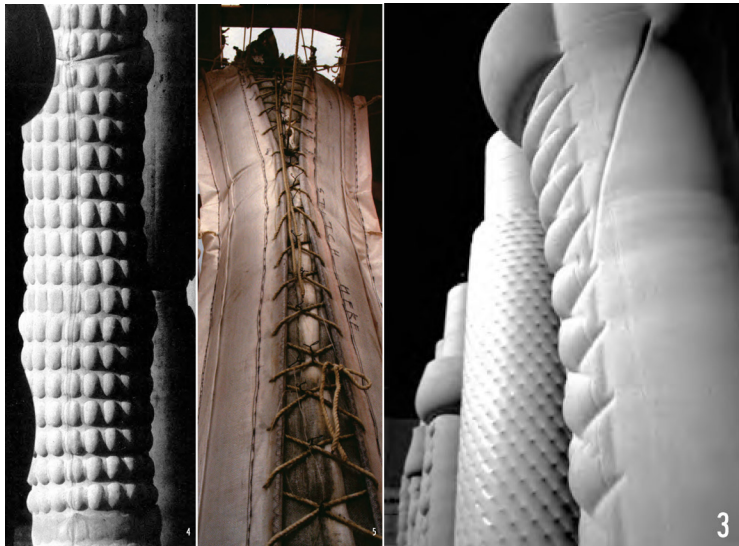
## forming material

Numerous materials are utilized in the production of architecture and dress design. The material from which space is constructed is as dynamic as the space itself, providing the opportunity to create new ideas of construction. The form and structure of these two fields of design tend to rely on the material that constructs the space of the body and of architecture.

Today many architects are re-examing material, testing their boundaries and constructing new matter for their

constructions. The University of Manitoba's C.A.S.T studio, explores the fabric qualities of concrete in a very dynamic way (right). Using cloth, they shape concrete in systematic way's to provide structural pieces that express ideas of movement, fluidity, and sustainability. Utilizing less material in a more visually and ideologically interesting manner. This experimentation defines a new connection between architecture and dress design, taking material native to the construction of dress to create forms that begin to mimic its figures. Additionally, these concrete forms are designed much like clothing, sometimes even mimicking their patterns such as the C.A.S.T studio's corset like columns. (West 2-12) This material analysis uses new ways of thinking to address concrete constructions that relate to scale, dress design, and architecture in a dynamic way of privacy and exposure. Today, innovations with material go beyond stressing ideas of privacy and aesthetic, emphasizing new ideas of space and occupation.





C.A.S.T. Studio  
experiments with concrete  
structure :: left

Personal experiments with  
cloth and concrete :: right

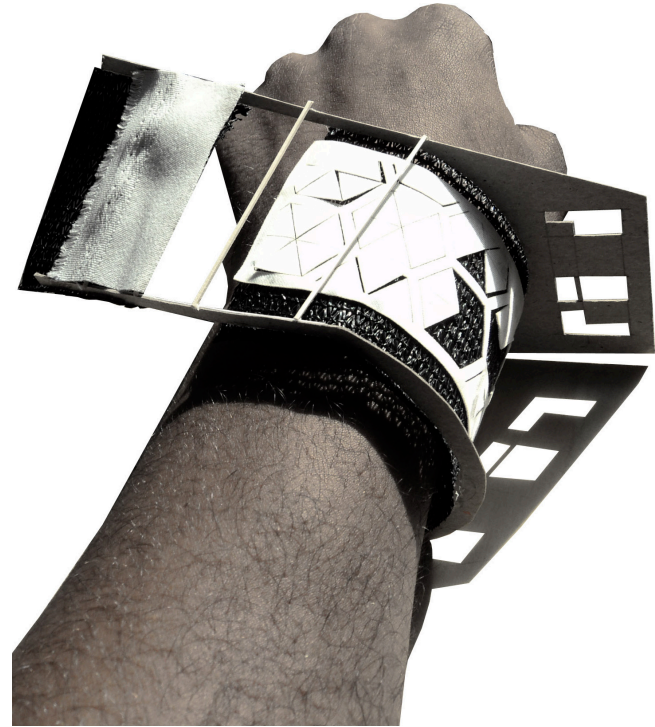


utilizing architectural methods of construction, a spatial construction was formed that utilizes the material and scalar qualities of dress design.

## structuring material

After analyzing the dynamics of material and testing their extents, I addressed scale and structure. In this fabrication. I took the scaled cloth and utilized it in a way similar to that of the constructed ring, tensioning it around a wood form and separating it with a piece of shade-cloth. The piece resulted in a form that reacts to the dimensions of the wrist.

This analysis was vital once again in understanding how to work with extremely pliable materials at a small scale. It allowed for the opportunity to once again think about pattern design and its influence on constructing space. Instead of dealing with the pattern alone, in this experiment, it is juxtaposed against a secondary linear system that functions in tandem a primary system.



The constructed object scales itself against the form of the wrist.

## designing material :: architecture + dress design

Utilizing the ideas and concepts from the previous exploration, I conducted the last small scale construction. In this fabrication, dress design and architecture were combined to create a new spatial representation in the form of a dress.



## two parts to one whole

### one

Occurring at the human scale, the construction began with a structural wood piece that emphasized the dimensions of the female form. As it wrapped the upper part of the body, it created an idea of manipulated interior and exterior space. 1/16" strips of milled heart pine were carefully formed to wrap the body and form a plenum space between the

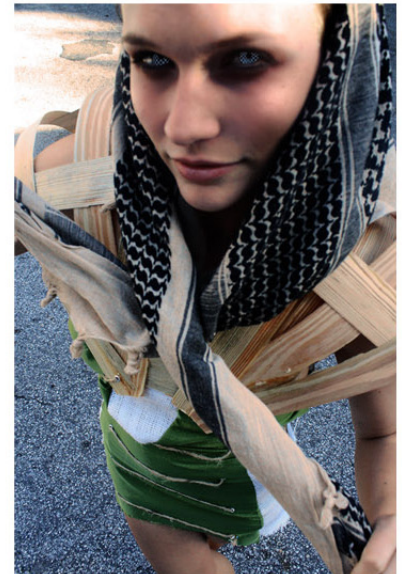


Utilizing the ideas of architecture and dress design, these fabricated pieces work together to express the form of the body. The unit made of wood emphasizes the importance of the arm and shoulder emphasizing movement while the dress pulls tight to the body emphasizing the natural form and curvature that the body offers.

shoulders and the wooden piece. The heart pine consisted of three parts, the first adapted to the immediate structure of the shoulders. Each piece of heart pine was soaked in water and then tightly formed to the body until dry. It acted as the primary armature that connects itself to the body. The second layer worked off of the first, attaching itself directly to the waist. This layer pulled away from the body exaggerating and emphasizing the form and function of the shoulders. The last layer worked in tandem with the second, it weaved

through the six strips of wood, becoming a secondary armature to structure the unit.

The main intention of this piece was to create a new material formed from a two-dimensional object. Much like the pattern, this object transformed as it was constructed, expressing ideas of space against the body as it emphasized and de-emphasized its dimensions.





two

Extending under the wood piece was a cloth dress that consisted of a synthetic material juxtaposed against burlap, the piece was a relief from the structural intensity of the shoulder construction, it cinched at the waist, pulling closely to the body. The Burlap was chosen because of its expression of texture and scale. The green synthetic fabric was used to offset the strong texture of the burlap. Together the two fabrics utilized the form of the female body to structure itself, much like the wooden armature piece. Both constructions coexisted with each other, interacting to form a new expression of the space of the female body.

Side view of fabricated dress :: Displays the integration of contrasting material and structure



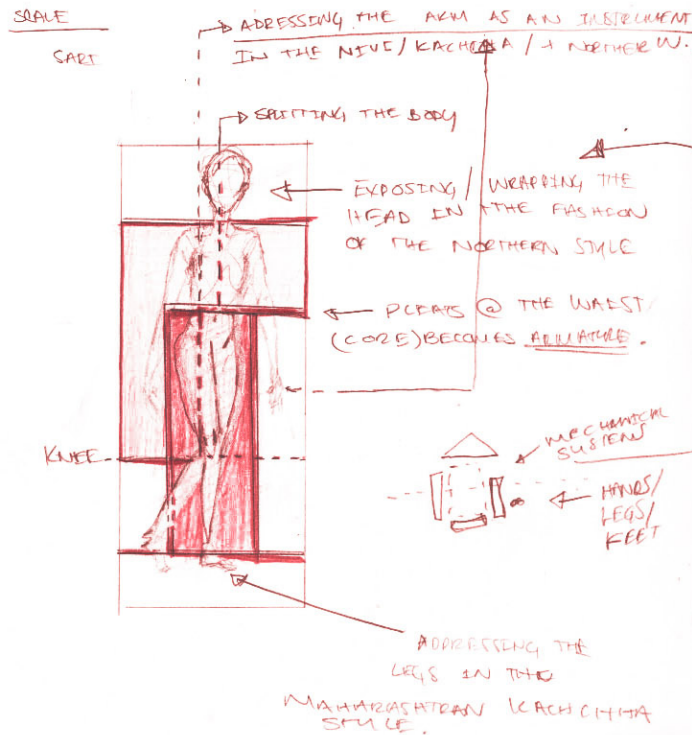




the Sari







→ TRANSLATING SCALE TO ARCHITECTURE

SPACE → HEIGHT / DETAILS (KNOBS/HANDLES)

→ VIEW → OVERHEAD → PROGRAM?

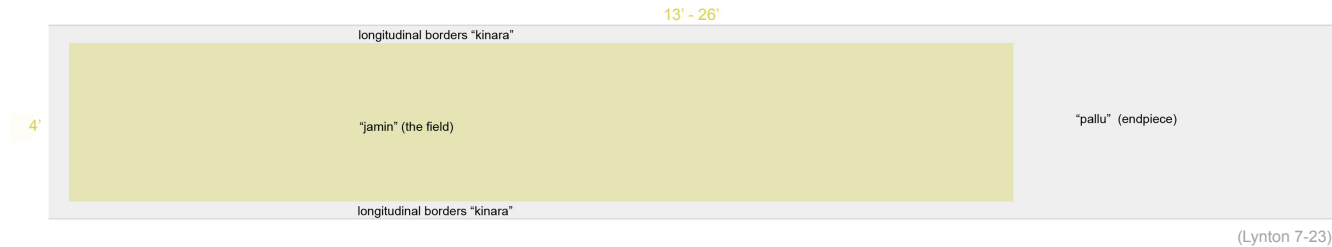
CAN PROGRAM BE BASED ON THE BODY? HOW YOU  
FIX IN A SPACE

#### PARTS OF CLOTH

KACHCHHA → TEXTURE

PALLY → FIT/RICE STRUCTURE

DRAPERY → INTERIOR SPACE + STRUCTURE



to understand the Sari, I began deconstructing its parts.

### fractional elements (Lynton 7-23)

Upon deconstruction of the Sari in the "Nivi" style, the most popular form of wrapping, I found that the dress begins with a base; a rectangular piece of fabric. This fabric is usually 13-26 feet by 4 feet, this length depends on the height of the person as well as the aesthetic appearance desired by the occupant. Historically, the cloth is sectioned into 4 pieces that wrap and hold the body within the construction.

#### *jamin*

The first part of the Sari is the field, called "the jamin," this area lies directly in the center of the rectangle offset to the wearers right side. It is the base from which the rest of the dress extends but also the most hidden part of the Sari. Architecturally, this is the primary armature that attaches itself to the body. The "Jamin" is least ornate part of the

## dress :: the Sari

After manipulating material and space through a series of fabrications, I then began to research a historical dress, the Sari.

I chose the Sari because of the process of construction inherent in its design. In addition, I found this dress interesting because of its relationship to my heritage as well as the way that it addresses the space of the body. In order

fabric because it is hidden beneath layers that extend from this form work.

#### *kinara*

Running along the edge of the clothe are longitudinal borders, named “the kinara.” These borders are used to hold the series of pleated elements that embrace the body. They allow “the jamin” to hold its orientation and are necessary to the whole. Architecturally, this piece is the secondary armature that holds “the jamin.” The “kinara,” is tucked against the body and holds the cloth in place. These borders are sometimes decorated for aesthetic reasons and are comparable to exterior structure of Sir Norman Foster’s Hearst Tower. They are not only aesthetic but are also used in the necessary structure of the building.

#### *pallu*

The last section of the cloth is “the Pallu.” Acting as the building façade, this piece has the most interaction with the movement of the occupant’s arms after construction. “The Pallu” pulls together the intricate wrapping, pleating, and weaving of the dress, creating the historical image of the Sari. Draped over the left shoulder of the occupant, the four feet of fabric can also be extended down the wearers arm to act as a covering during ceremonial occasions, such as weddings. This piece is the most heavily decorated part of the cloth. Acting in tandem with the glazing on a building,

which is used to transmit light and can also be constructed to function as a means of privacy, such as shadow.

#### *construction*

The construction begins by evenly wrapping the Sari around the body once, beginning at the edge opposite “the Pallu” and tucking the longitudinal borders, “the Kinara,” into the waist-line. After one full wrap the occupant returns the cloth to the front center line of the body where the process began. Next, the wearer takes “the Pallu” and wraps it loosely around the body once, returning once again to the front center-line. The “Pallu” is pleated and draped over the left shoulder. This is the point when the occupant chooses how long the draped fabric will extend down their back. Then the wearer pulls the top of “the Pallu closest to the neck tight to the body, pulling the excess cloth from the step before together at the center-line . Next, the excess cloth is pulled into the hands and folded into even pleats that are then tucked into the left-top-side of “the Kinara,” the longitudinal border, this braces “the Jamin” against the body. Last the wearer adjusts the width of “the Pallu” based on the activity, choosing either to keep the pleats or remove them and extend the cloth down the arm. This process of construction, while simple creates a very complex dress that wraps and folds the body in a dynamic manner.

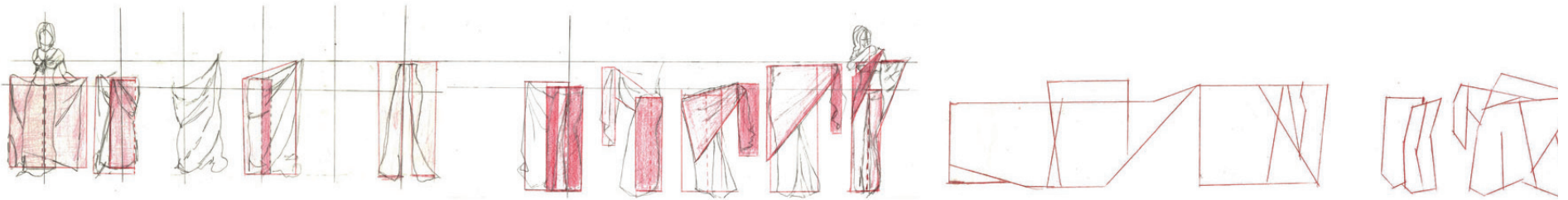


#### results

Learning this construction process is relevant because it is architectural in construction and definition of the space of the body. Breaking down the construction, I found a way to transform the process of design and its necessary elements into a series of terms. Derived from the construction of the Sari. In addition, I was able to better understand the idea of manipulating a two-dimensional material to form space. This is similar to the design and conception of pattern making. In this instance the dress accentuates the body length and figure extending vertically from the center-line of the form.

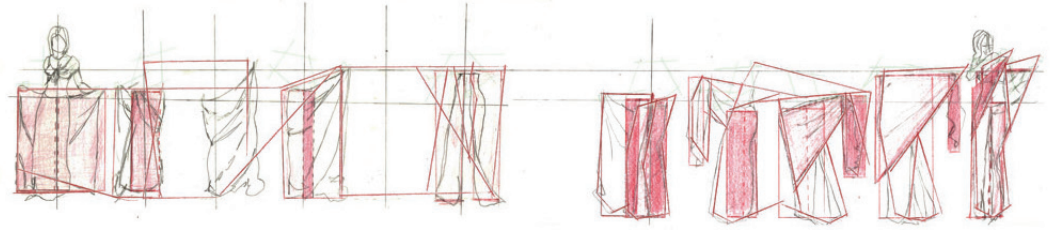


Sari wrapped in the most popular "Nivi" style.



## analysis of the Sari

---





“The notion of archeology  
evidently introduces the  
idea that what confronts us  
is not a reality that forms a  
closed sphere but a system of  
interweaving languages.”

-Greg Lynn (620)

# analysis of the Sari

## deconstructing the Sari

To better understand the construction of the Sari, I began drawing diagrams that analyzed each operation. Each set of drawings was composed of ten operations that described different actions. These actions made up a system of interweaving languages that evolve throughout this process of analysis. I summarized the main movements of construction into four terms.

### wrapping

The construction of the Sari is made up mostly of moves that involve wrapping around the body. This wrapping allows the cloth to become holistically juxtaposed against the figure of the occupant. It graces each curve and dimension of the body in a particular manner that is consistent with the operations of the “Nivi” style of construction.

### pleating

A secondary process that occurs in the construction of the Sari, is pleating. This term identifies with the construction of the armature, it is the first step that occurs before creating the multiple armatures. Pleating becomes an important part

of creating the space of the dress against the body. This process creates particular shapes that interact with the form of the body. These forms also have the ability to transition as they change during the movements of walking and interacting with everyday life.

### weaving

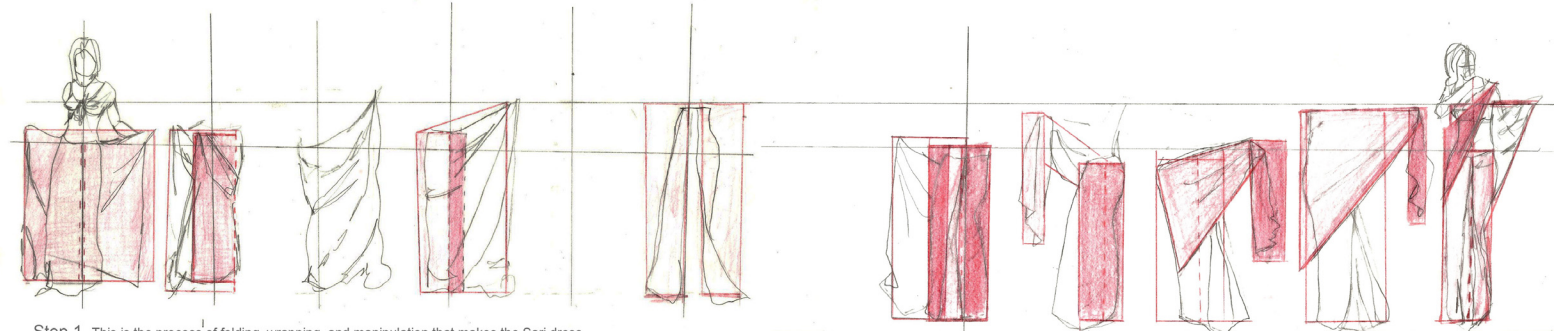
The third term used in the operations of the Sari, is weaving. Weaving occurs in the last three steps of construction. At this point the wearer weaves the extra fabric underneath “Pallu,” back around the body and continues to embrace the body, tucking extra fabric into the “Kinara,” the longitudinal borders.

### embracing the body

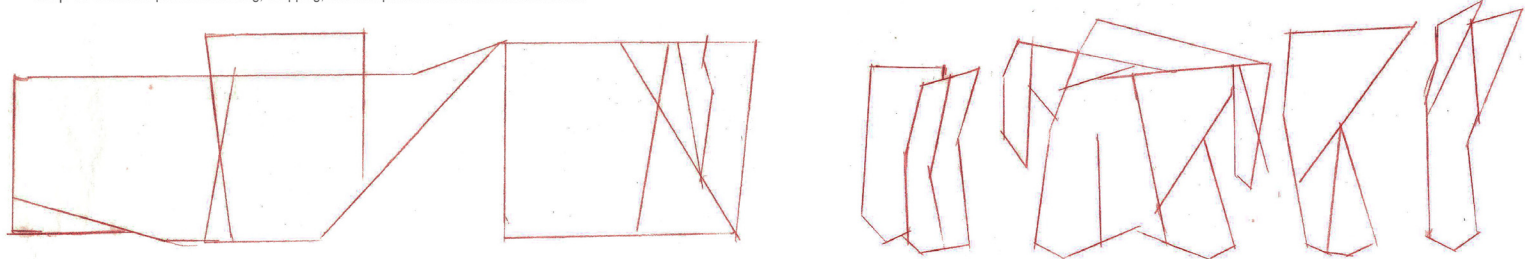
Embrace of the form is the last term found from the deconstruction. This action forms the armatures of the dress through a process of tucking and material folds. Within this term is the control to shape the dress in a particular manner, it allows the wearer to adjust the outfit in a way that is consistent to what they prefer.



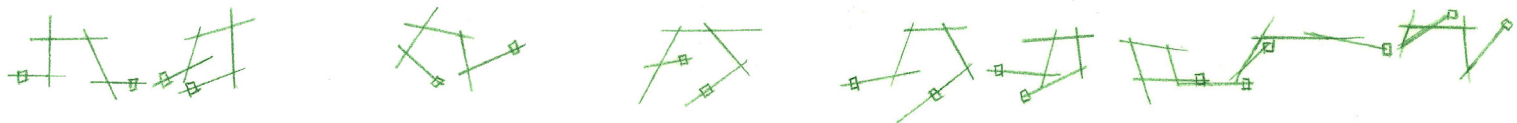
# Drawing Analysis of the Sari



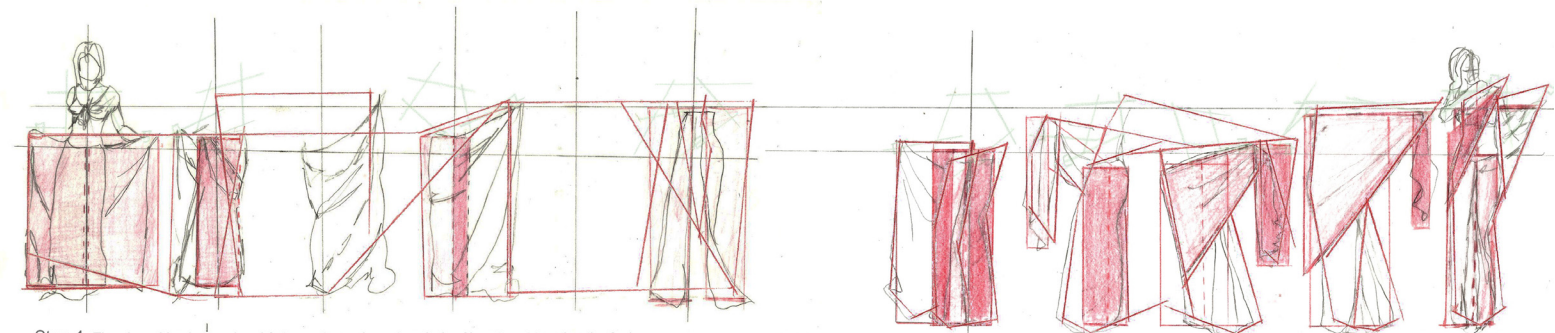
Step 1. This is the process of folding, wrapping, and manipulation that makes the Sari dress.



Step 2. I then began to connect the moves to find connections between the steps along the axis of the longitudinal borders of "the Kinara."

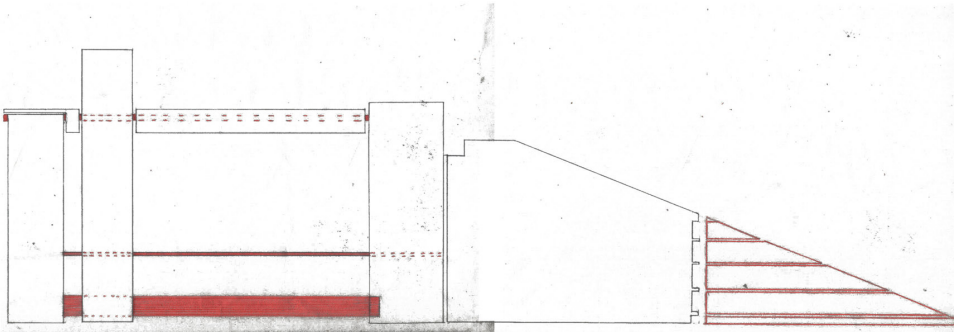
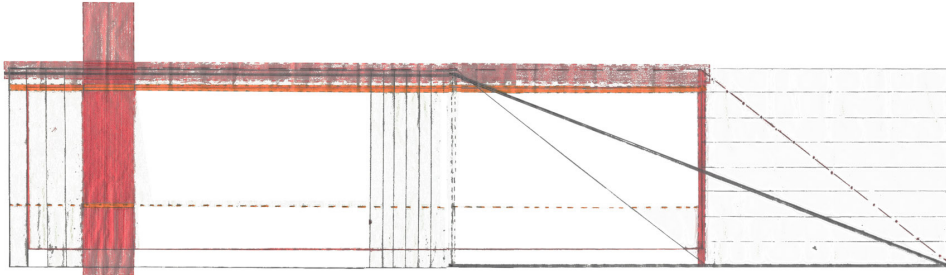


Step 3. Next, I took a look at the position of the arms, in each step. This was an effort to understand the relationship between the arm and the fabric.



Step 4. Then I combined steps 1 and 2, to create a coherent analysis of how to put together the Sari

## analysis in two dimensions



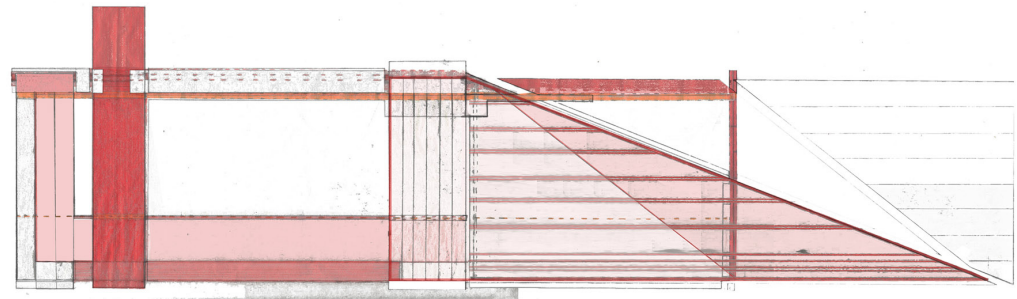
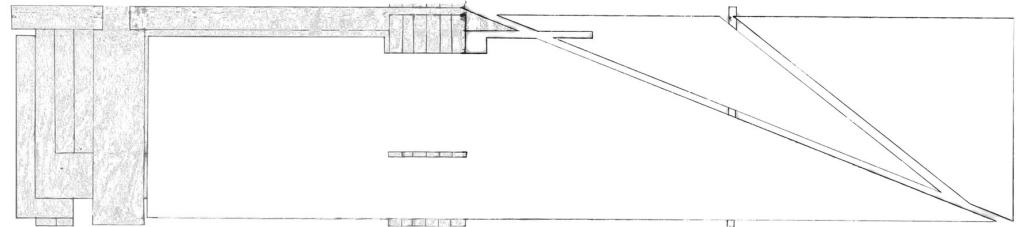
After some general analysis, I began to diagram the operations of constructing the Sari along a single two-dimensional plane, the scale of the base of the dress. In this series, the connections between the operations become evident.

As I continued to analyze the operations along a two dimensional plane, I began to extrude different details, placing emphasis on certain operations. In the diagram to the left-top, the operations are unified through the scale of the body.

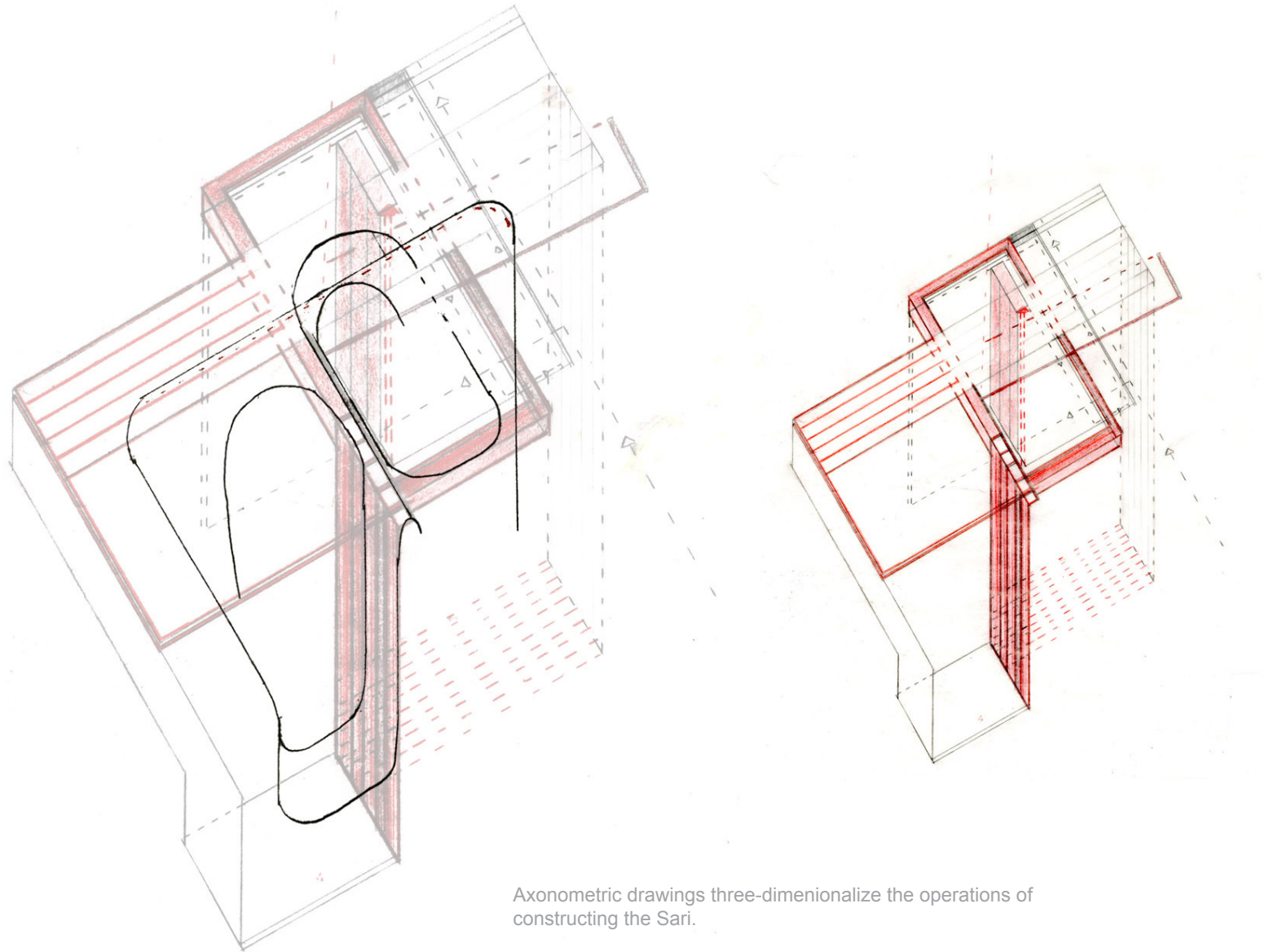
The diagram in the lower-left corner places emphasis on the role of the “Pallu” as a major aesthetic and organizational unit.

The diagram in the top-right corner describes the function of the “Jamin,” as it embraces the body and sets the pace for the following operations.

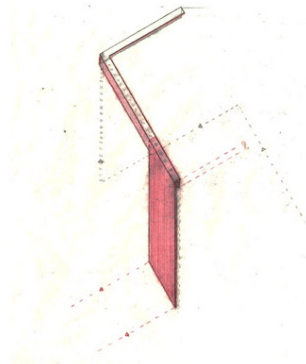
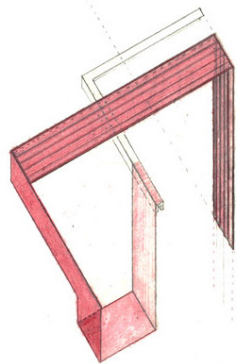
The last diagram to the right, stresses the importance of the role of the occupant and creator. Identifying the placement of the hands during the process as the Sari begins to wrap, pleat, weave, and embrace the body.



## analysis in three-dimensions

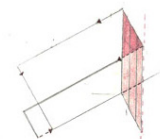
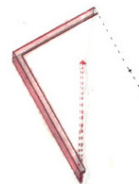


Axonometric drawings three-dimensionalize the operations of constructing the Sari.



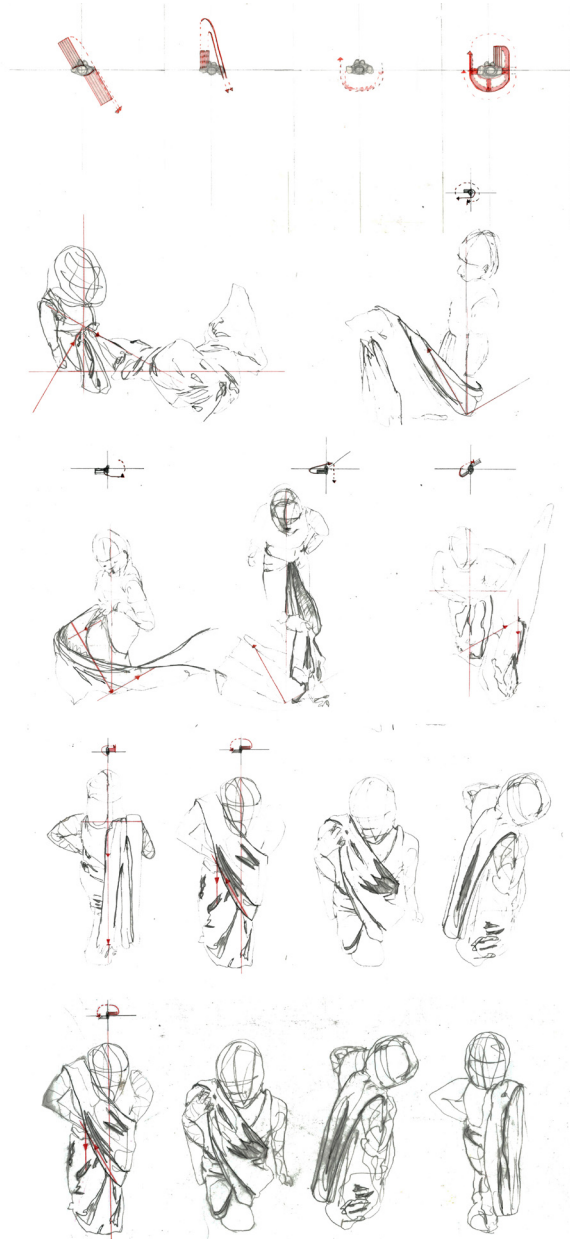
## analyzing the Sari in three-dimensions

After diagramming the space in two-dimensions, I then began to extrude the operations into axonometric. This was an effort to better understand the movements of the Sari. Moving from left to right, the diagrams break down the role of the “Jamin,” as it wraps the body. They then express



the action of embracing as the “Kinara” juxtaposes itself against the body. Moving forward the diagrams express the movement of the “Pallu,” as it wraps the body in the last step. The larger diagrams compose all operations into one unit. They enhance the transitory space around the body. In addition, this diagram begins to force a material perspective. Strong linear elements begin to organize the operations in as they evolve.

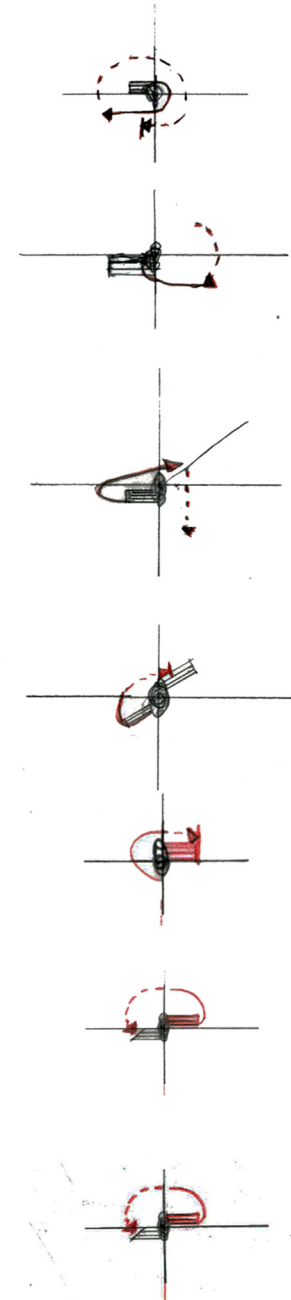




## inscribing the actions on the body

After constructing the axonometric, it became important to juxtapose the actions against the human body. This was an effort to comprehend the interaction between the cloth and the person. The series of diagrams to the left were constructed in real space, as the Sari was being wrapped. What began to become prevalent was the role the hand played in the construction of this garment. In addition, the reaction of the cloth to the movements was identified. Space begins to exist within the material folds of the cloth and a better grasp of the material of construction was made clear.

After constructing these drawings, it became important to understand the movements in plan. The drawings to the right, identify each action in plan, diagramming the movement that follows. These drawings describe the importance of wrapping around the body and the effects of one move upon another.

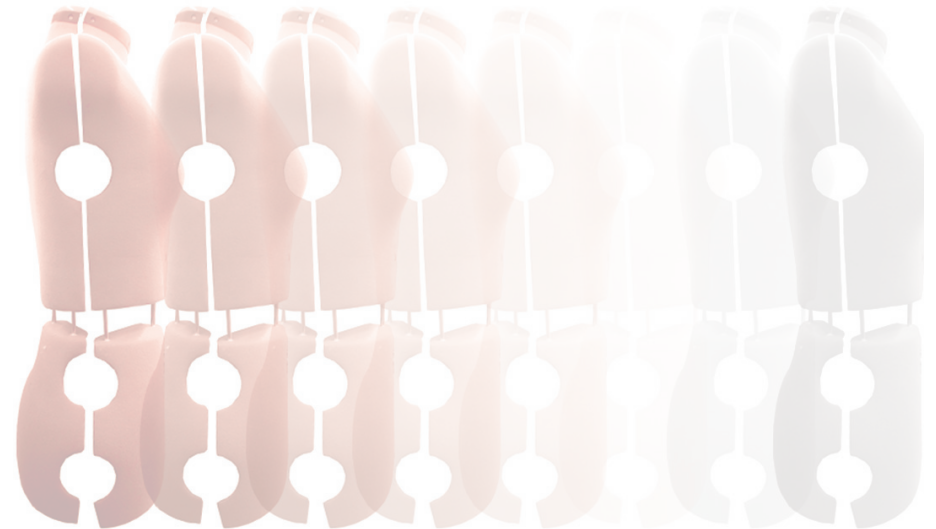


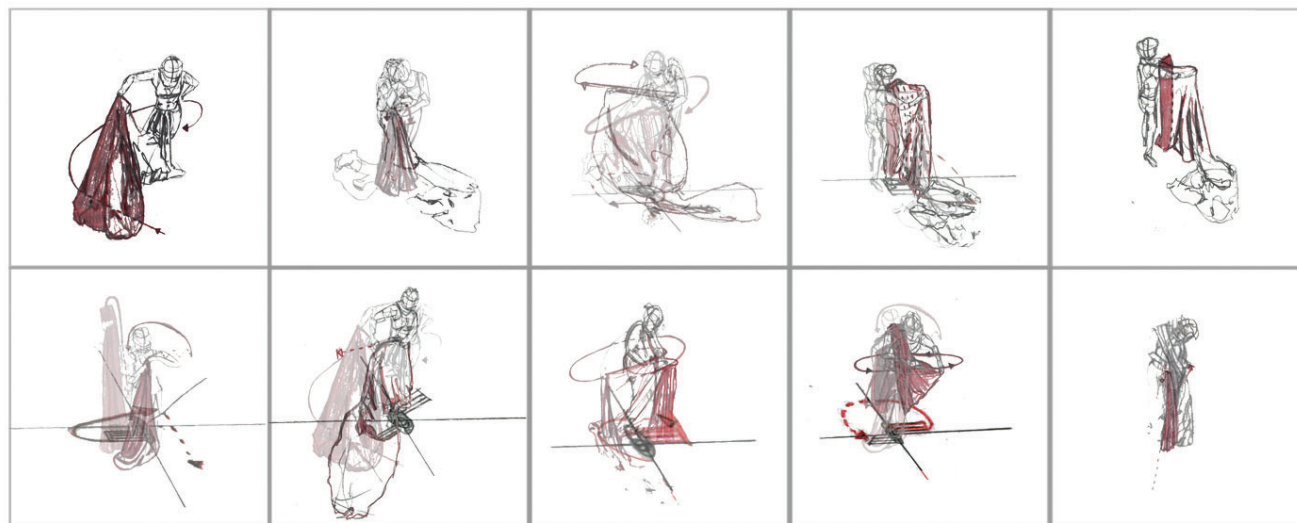
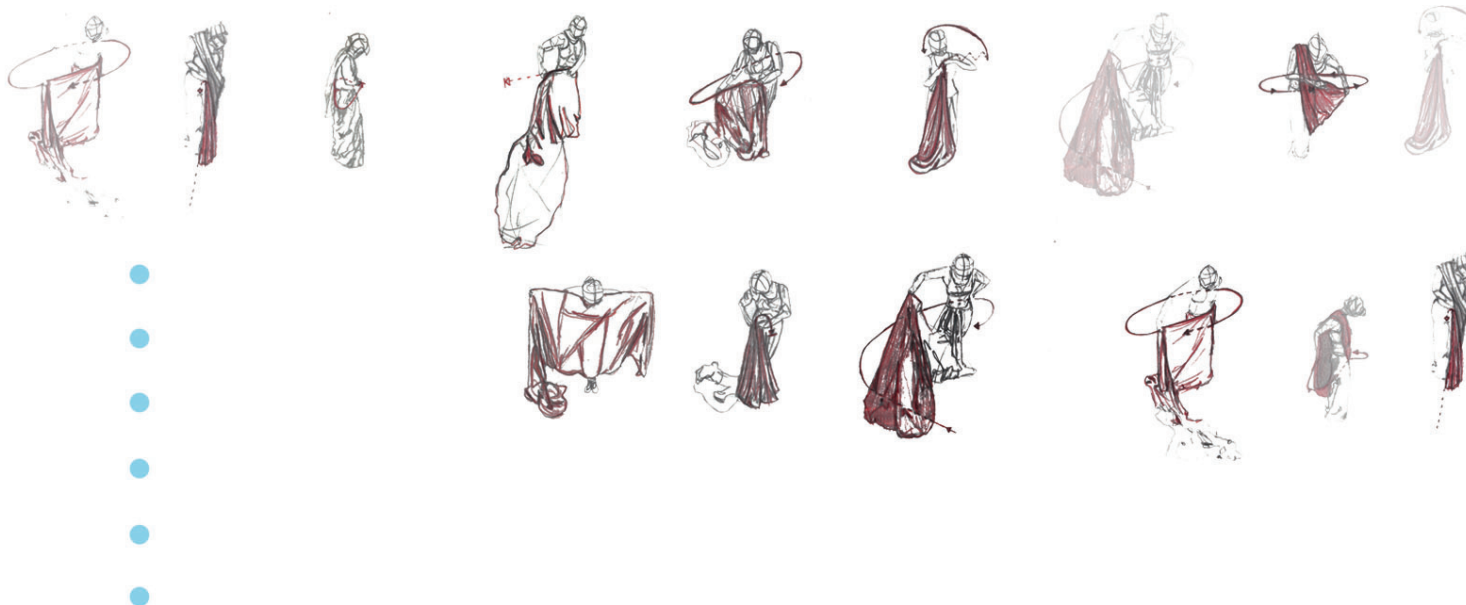


## reactions

The diagrams that follow describe the reactions of each move to another. In this series, I combined the sketches of the actions inscribed on the body according to order. The cloth was highlighted to improve the connection of the space to the body. In addition, the smaller scaled spaces that occur in the material folds of the fabric became clear. As the actions were combined, the reaction of one to the other forms a unique space around the body. This became interesting upon many levels. First, the space was third-dimensional. Second, an idea of the impact of dress design on architecture was also formed, this analysis questions the scale. Occupation of the spaces between the body and the cloth exists at many scales throughout these drawings. Identifying the idea the scale was no longer an issue. That the object constructed from the combination of architecture and dress design can be occupied at numerous scales between the small scale of the hand and the human body, to the larger scale of architectural spaces.

In the last diagram, all series of action sketches were combined to form another new form of space against the body. This image became important to the development of how to form the space of architecture and dress design that can be occupied at numerous scales.





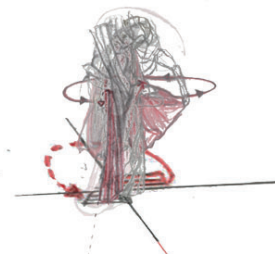
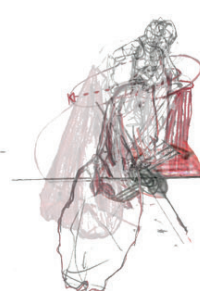
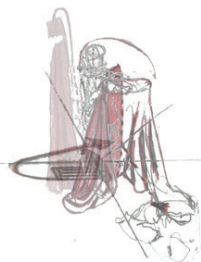


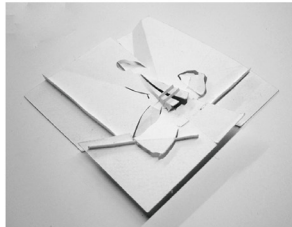
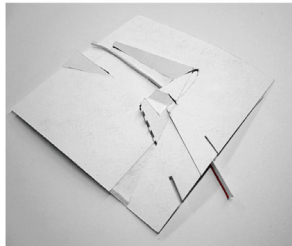
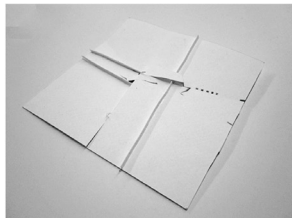
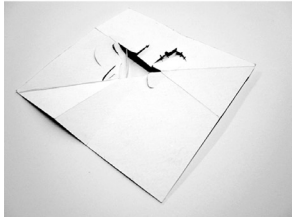
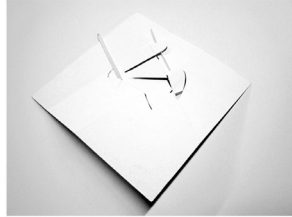
Left-Top :: Individual  
operations of construction

Left-Bottom :: Operations  
of construction combined  
into pairs

Right-Bottom :: Operations  
combined into sets of four

Right-Top :: All operations  
combined into one drawing  
analysis





## fabricating the space of the Sari

After composing the Sari operations of the Sari into one diagram, I found it important to once again three-dimensionalizing the space that these operations created. In this series of relief models, I extruded the operations of the Sari into space. This analysis begins to draw conclusions about material. The use of the linear elements began to support the operations of wrapping, weaving, pleating, and embracing the body.

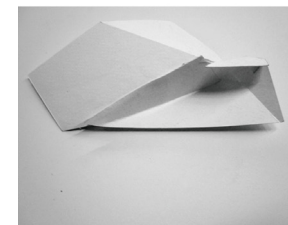
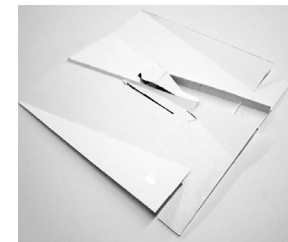
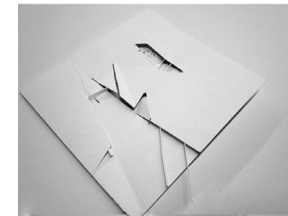
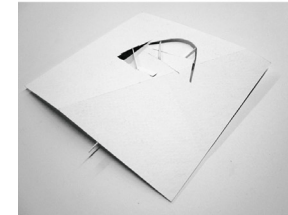
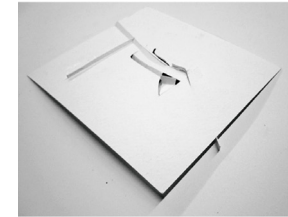
The first attempt at modeling this space was diagrammed with the effect of two operations. Ten studies were fabricated that operate at no specific scale. This is due to the idea that the construction of space defined by the parallels of architecture and dress design should be able to be occupied at numerous scales.

After constructing ten spatial objects with two operations involved, I then began to draw on my previous analysis of the actions of the Sari to once again fabricate a new type of space. The two new models also exhibit ideas of materiality in the same way as the smaller relief models. These two larger models take into account all actions of the Sari combined. The first model, on the pages that follow, were constructed in a very rigorous manner. The cut paper pulled from the page were the material folds of fabric with the interaction of the hand. Small square cuts orient themselves were the pleats became most important in the formation of the space. Linear elements drawn from the same

watercolor paper, began to support the material folds with the actions inscribed.

This same process was projected onto the second large relief model with all operations combined. The difference in this model, is that all actions were re-arranged in a less conventional manner. Each action did not follow the next. The operations are arranged according to how the spaces created by the fabric interacted with one another.

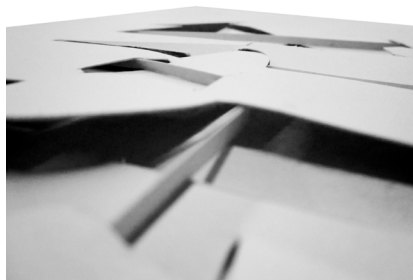
This process of analysis allowed me to once again consider the ideas of pattern making, a process that is necessary in dress design. The actions printed on the opposite side of each relief model acted as patterns that organized the construction of space that was formed on the top side of the relief model. Similar to dress design, the linear elements began to support the spaces created by the pattern, like thread. In conjunction with one another a new material construction was formed that holds within it the ideas of architecture and dress design.



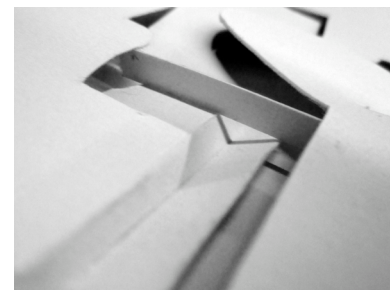
## material relief constructions

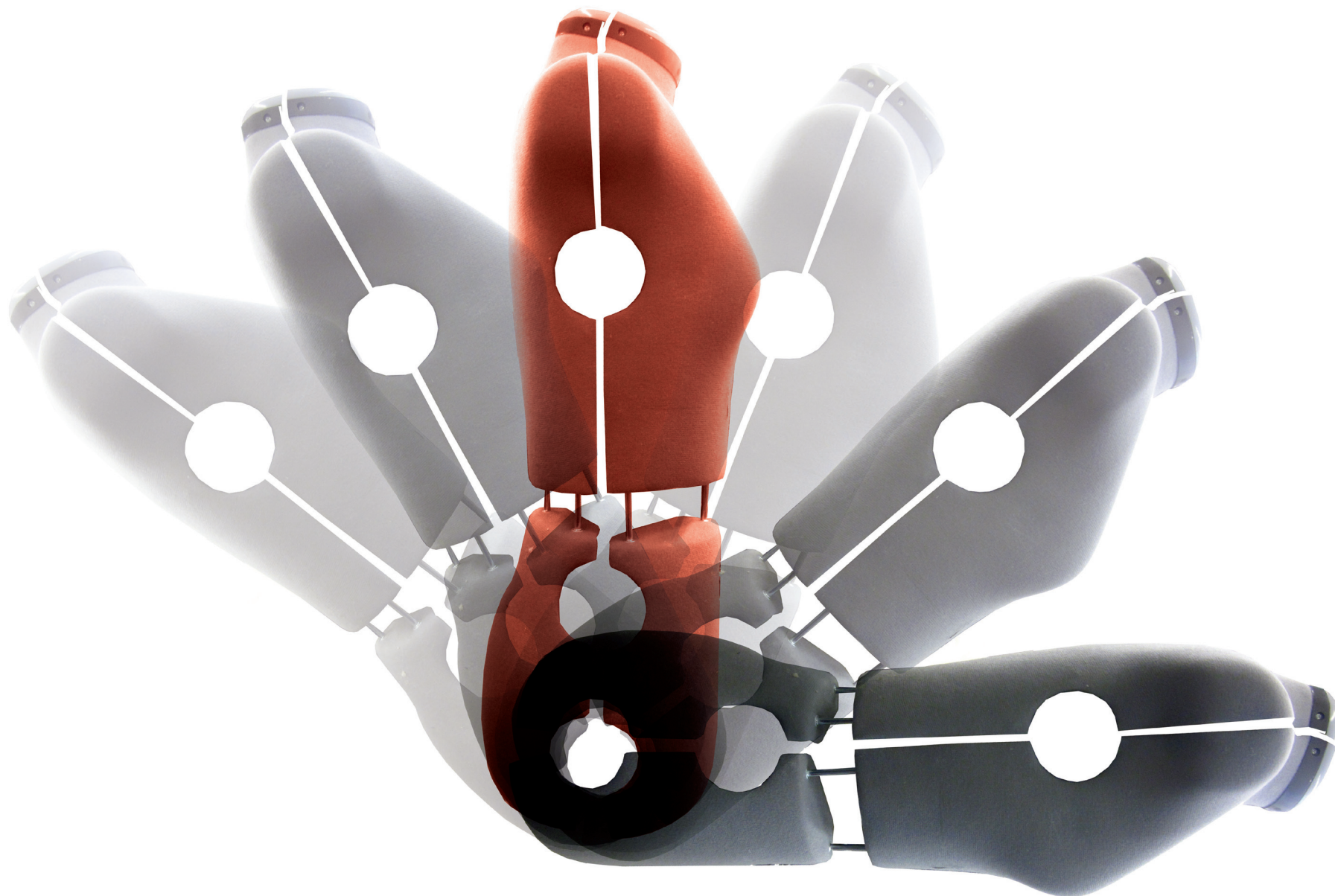
Relief models constructed from an analysis of the Sari.  
The models are formed from all operations of construction combined. The paper is manipulated to form a new material that exhibits systems of space and structure.

These models were constructed through a system of cuts and folds that initiate ideas of wrapping, weaving, and pleating as they organized themselves against each other. A linear system linked the extruded spaces, translating the ideas inherent in garment construction into a spatial object that exhibit material qualities

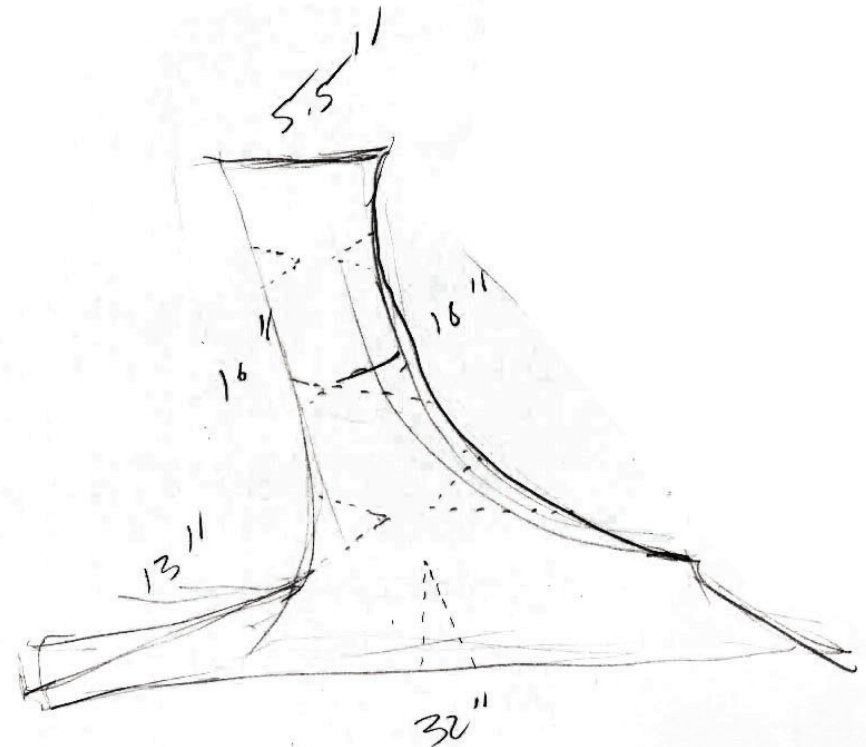
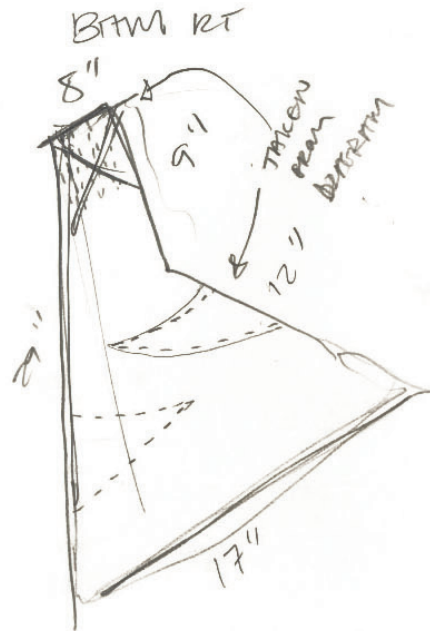


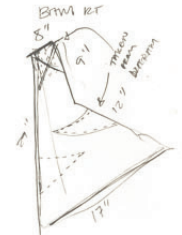
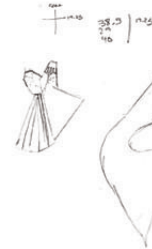
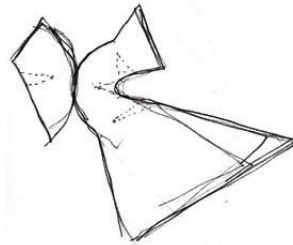
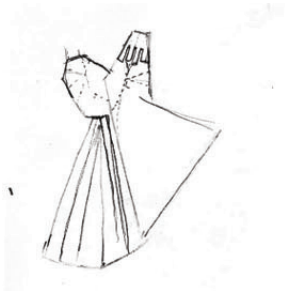
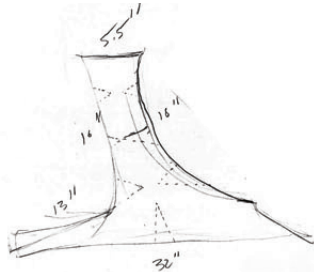
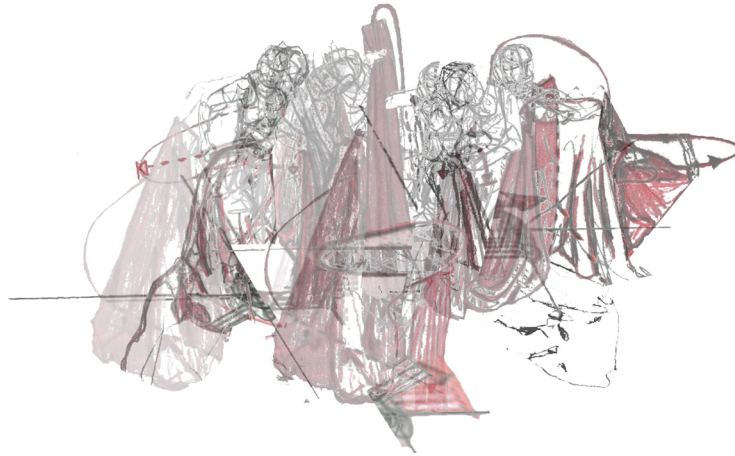






# pattern making





Patterns were derived from a previous analysis of the Sari. The diagram at the top of the page represents all of the operations utilized in the construction of the dress, combined.

## testing the pattern

After diagramming the Sari and constructing the relief models, the idea of material was translated into the pattern. Drawing from the Sari analysis, I pulled the patterns from the diagram that contained all of the operations of construction juxtaposed against one another. Just as in pattern making, the process began with a two-dimensional plane that is extruded into space. Utilizing this plane different patterns were constructed upon the ideas of weaving, wrapping, pleating and embracing the body. This experiment yielded five dynamic patterns that were then pleated. Much like a linear element. The pleating begins to spatialize the object, constructing a new material that can express the space of the pattern. The triangular pleats were organized against the joint of movement derived from the previous analysis.



Utilizing the patterns drawn from previous analysis, a three-dimensional spatial unit was constructed. This piece was then molded to a dress form to analyze the interaction of the patterned space with the body



## juxtaposing the pattern against the body

The next step in this process was to attach these inherently architectural objects to the form of the body. After examining the five patterns that were formed, three patterns were juxtaposed against one another. Already pleated, additional pleats were constructed to join together the three patterns so they could work in tandem. In addition, as these pleats were made, extensions and reductions in the lengths of the triangular pleats allows the patterns to interact efficiently with the body. The end result was a new spatial and material object that expresses the form of the female body. Wrapping the body, much like the 'Pallu,' the last piece constructed in the Sari, this piece pulled together the ideas of wrapping, weaving, pleating and embracing the body. It accentuated the shoulder, drawing closer to the waist and extending outwards as it moved away from the bodies core.



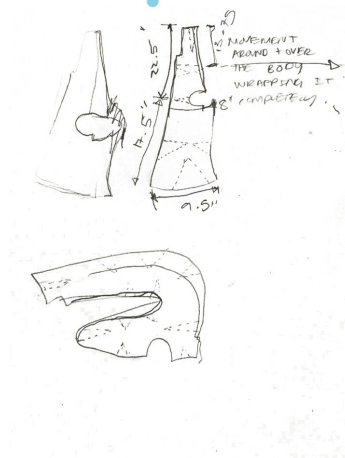
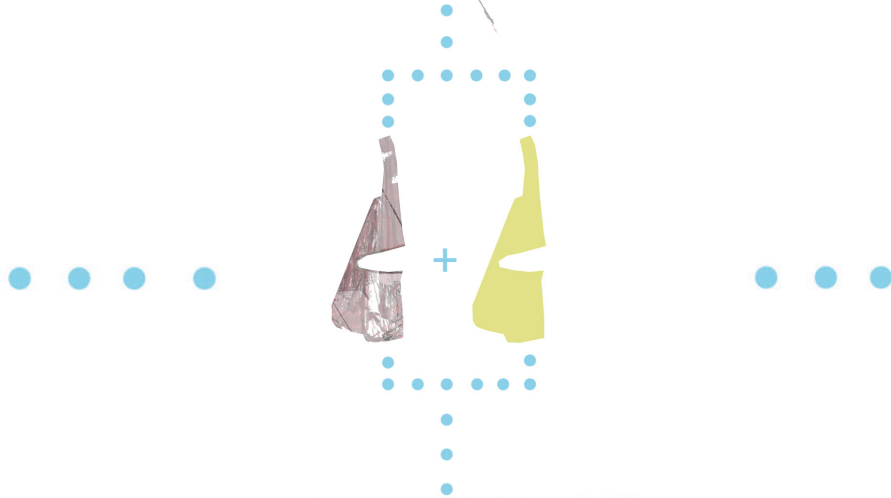


Dress formed from  
patterns derived and  
structured by the analysis  
of the Sari

## material and space :: incorporating the linear element

This diagram is a representation of the process of constructing a new spatial object that exhibits ideas of the space of architecture and dress design. The object that is formed utilizes the diagrams of the Sari and the process of material construction that extends from the previous relief models.







same language of the relief models, each operation chosen to form an overall idea of wrapping, weaving, pleating and embracing the body found throughout this process.

The linear elements supported the material cuts and folds while following the operations inscribed in the construction of the Sari. They expanded on the idea of constructing space and material through the ideas found in this exploration to form a link between architecture and dress design. Following the ideas of weak architecture this construction puts emphasis on the tectonic density and compositional rigor of material and space.

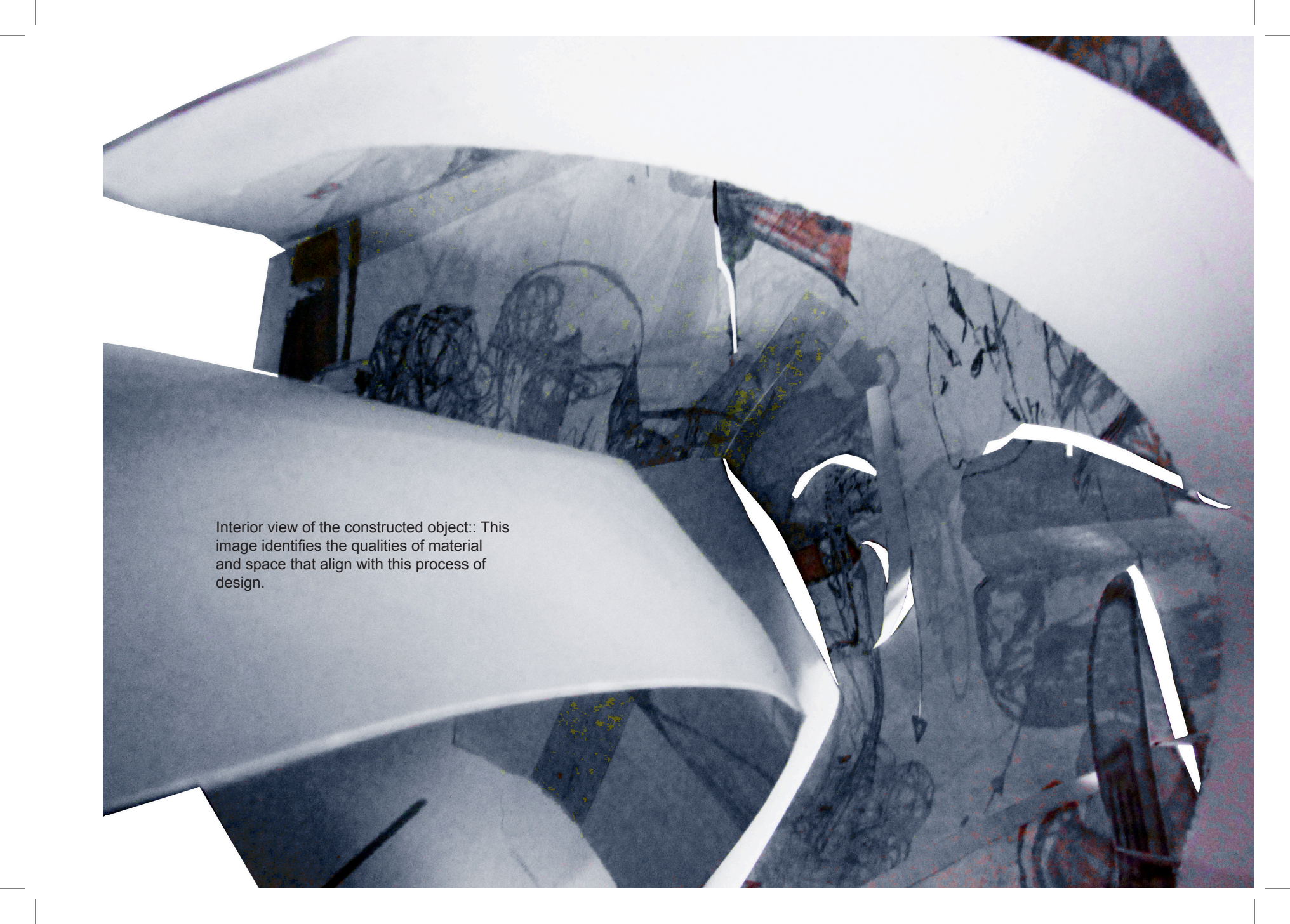
## juxtaposing material and space

After constructing the first pattern, a material-linear system was introduced into the construction of a new object. Like the previous form, the patterns in this relief model were pulled from the diagram of all the operations of the Sari juxtaposed against one another. Unlike the first object, the surface was manipulated in addition to triangular pleats. These pleats were constructed before the spatial object was placed upon the dress form. This was done to emphasize the idea that the object could exist at numerous scales without having to be constructed to one particular scale. The material folds extruded from the paper followed the



Detail of material qualities inherent in spatial the construction



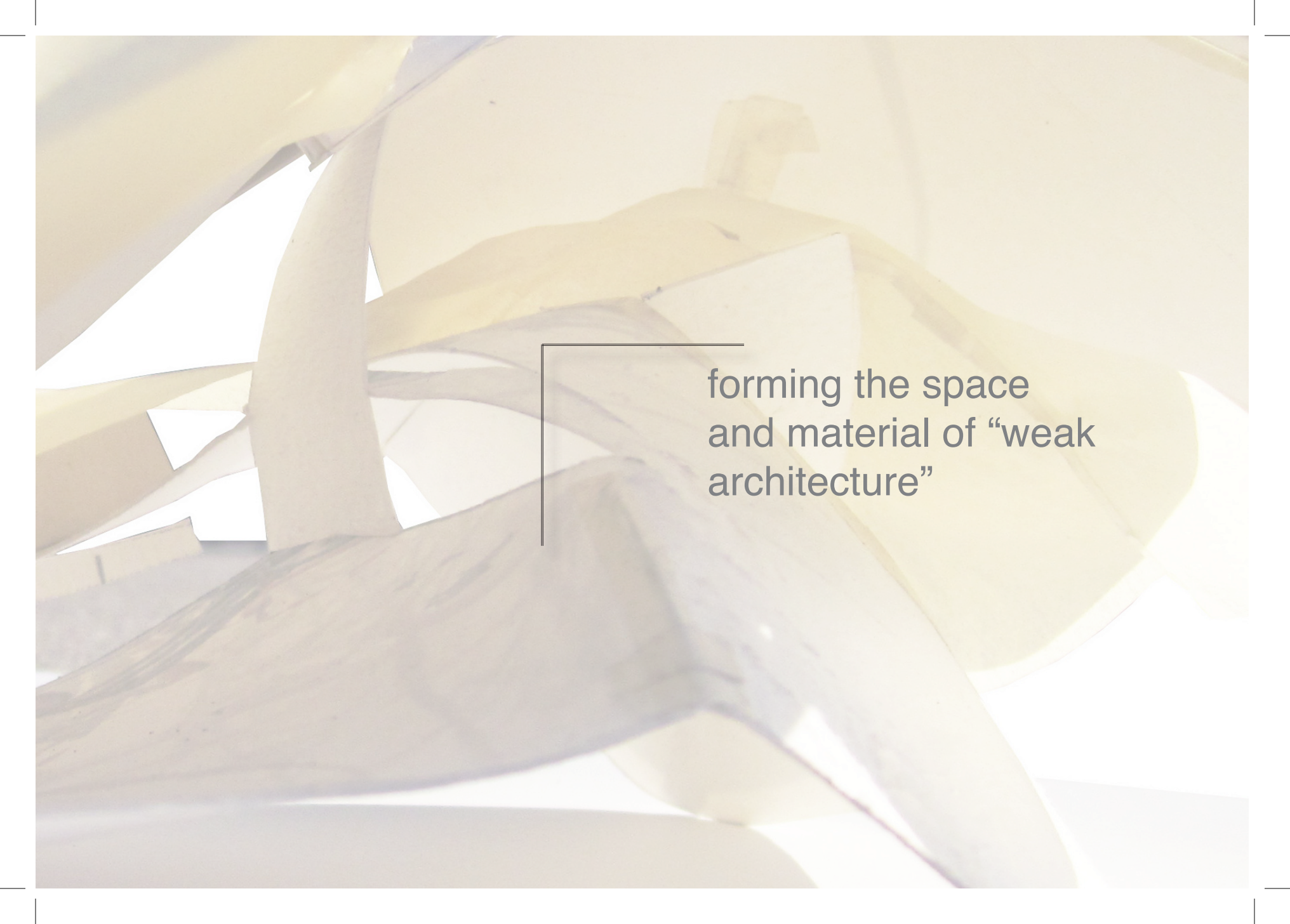
The image shows a complex, layered structure made of paper or cardboard, viewed from an interior perspective. The structure is composed of various shades of grey, white, and blue, with some areas showing signs of wear, such as yellowish-brown stains and red marks. The edges of the paper are jagged and torn, creating a sense of depth and complexity. The overall composition is abstract and architectural, with a focus on the interplay of light and shadow across the different layers and surfaces.

Interior view of the constructed object:: This image identifies the qualities of material and space that align with this process of design.







The background of the slide is an abstract composition of layered, torn paper. The colors are warm, ranging from light cream to pale yellow and soft beige. The paper pieces are cut into irregular, organic shapes and are layered on top of each other, creating a sense of depth and texture. Some edges are sharp and jagged, while others are smooth. The lighting is soft and even, highlighting the natural grain of the paper.

forming the space  
and material of “weak  
architecture”





## space, material and ‘weak architecture’

Greg Lynn summarized Ignasi De Sola Morales, “Weak Architecture,” as a process based design that holds within it the production, tectonic, density, and compositional rigor needed to construct the next emerging definition of space. Utilizing this idea, helps further examines these ideas through the construction of a spatial and material object. This object has the ability to occupy numerous scales and is a product of not only “Weak Architecture,” but the complex processes of dress design.

The object itself not only creates numerous scales of space but it also forms an idea of material that is based off of a linear-structural system that moves through the model. This system, wraps, weaves, supports and creates new

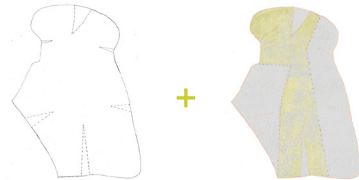
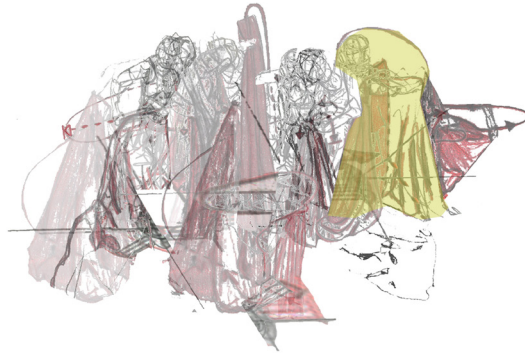
spaces that have the ability to be occupied in different ways. Generated off of the analysis of the Sari, the basis for this system was created throughout the process of the project as a whole.

## construction

Utilizing the previous knowledge of pattern making and the diagram of the Sari with all operations combined, the process of construction was initiated. After pulling the pattern from the drawing, two identical patterns were drawn on one piece of sketch paper and two different pieces of watercolor paper. A total of three patterns make up the final spatial object. The first watercolor pattern was manipulated in a manner similar to the relief models, material folds were extruded from the two-dimensional plane but not braced. Next, triangular pleats were cut into this pattern following the operations of the Sari. Following this, the pleated, cut plane was extruded in three-dimensions.

After completely forming the first pattern, without the linear system, the second pattern which was constructed from sketch paper was pleated and extruded in three-dimensions.

# spatial constructions of pattern and material



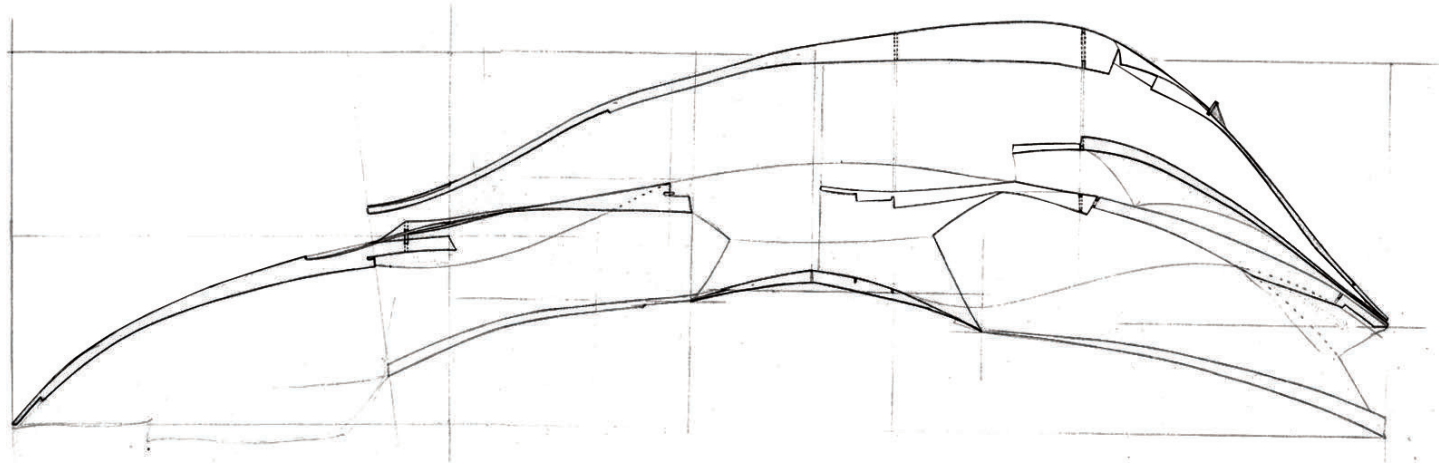
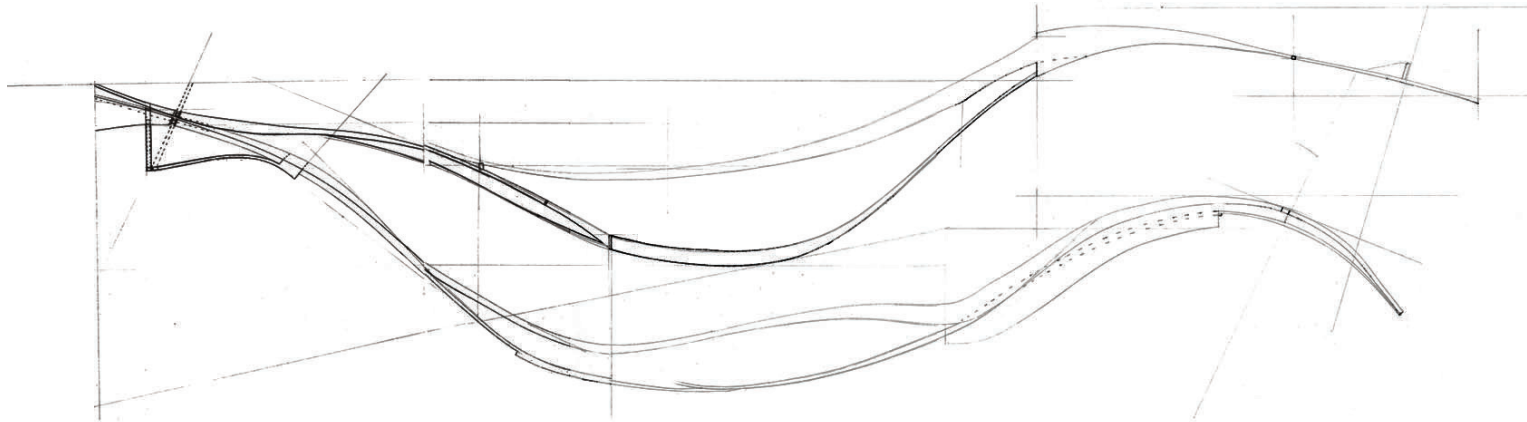
At this point it became important to construct the material aspects of the object, beginning the formation of the linear system that runs through the piece. While constructing this linear system, the last pattern was split into three parts. Each part began to integrate itself into the linear system reacting to the two other patterns. After the construction was complete, the resulting form held within it multiple scales of spaces that reacted to each other in a dynamic way. The ideas found in the deconstruction and analysis of the Sari were still prevalent. In addition, the concepts of wrapping, weaving, and pleating became more dominant as movement through the spaces advanced.







## architecturalizing the space





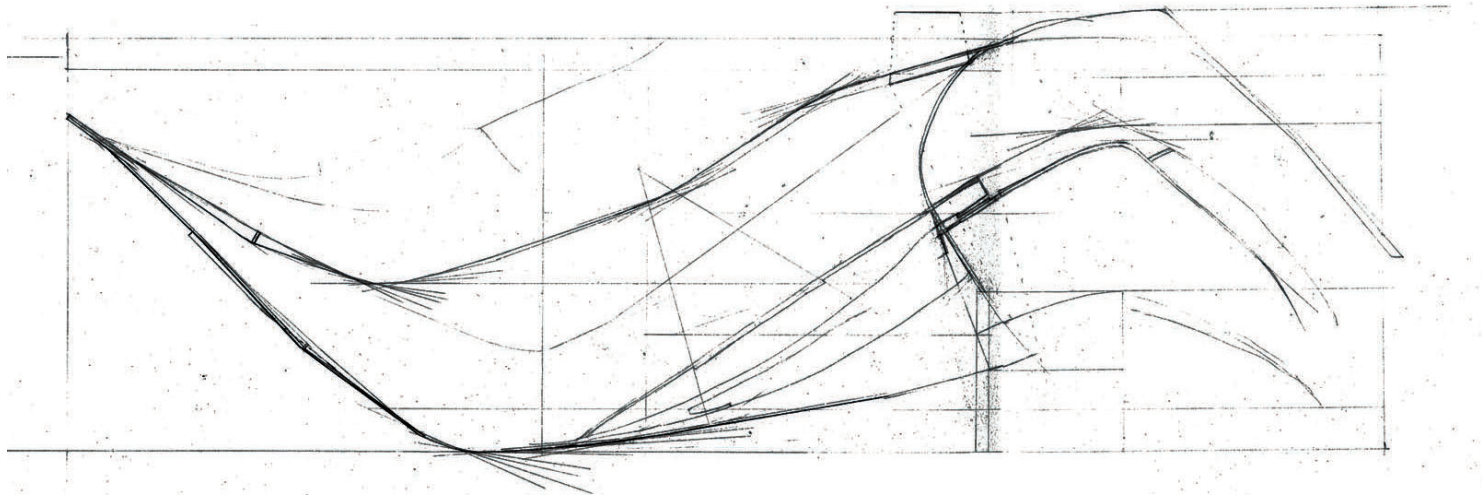
## sectional spaces

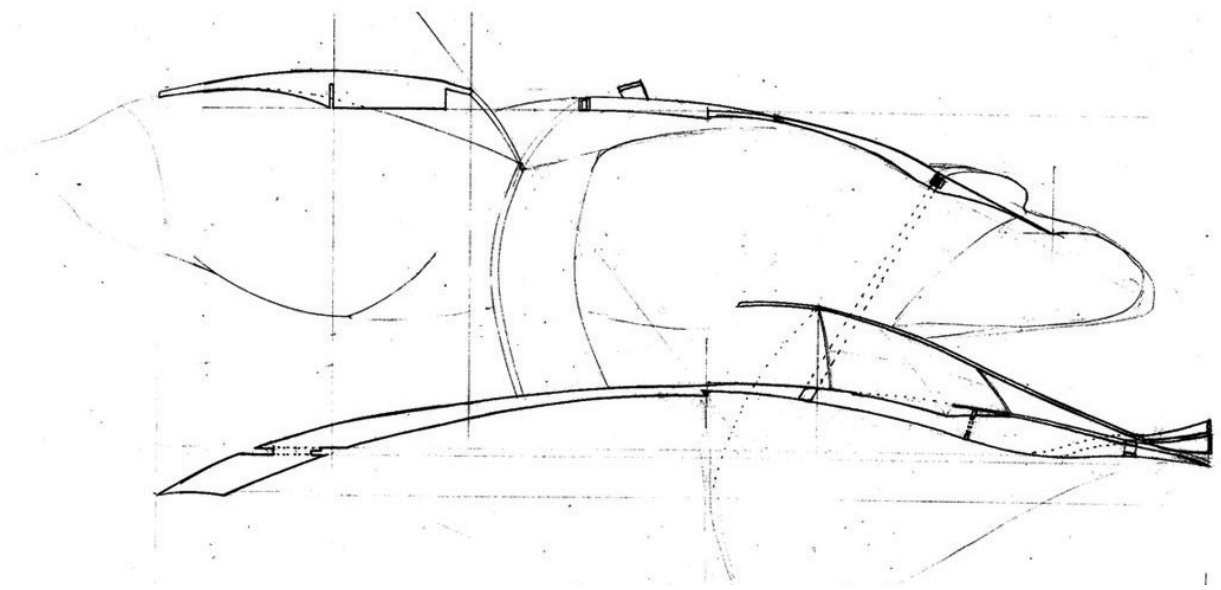
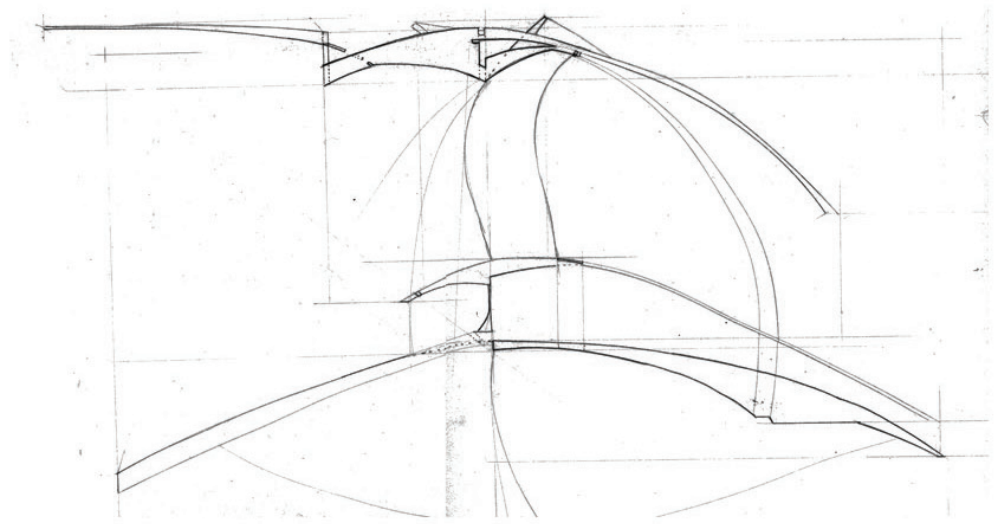
After constructing the spatial model, sections were drawn through the spaces with the most dense information. This density was a representation of complex transitional space and strong qualities of structure and system.

Stressing the material qualities of the space, the thin planes of the curvilinear form were expanded and compressed in dimension. This allowed emphasis to be placed on the interaction of the pattern with the linear-structural system

that supports the form. Scores and cuts were inserted within the densities of these elements to expand on ideas of permeability and constructional rigor. Within the resulting sections a number of spaces were found that interact, react, and juxtapose themselves against one another in a dynamic manner. The patterned spaces exempt numerous shifts in scale that form new ideas about occupation.

These ideas of occupation become more evident as the process continued to develop.





## systems of material

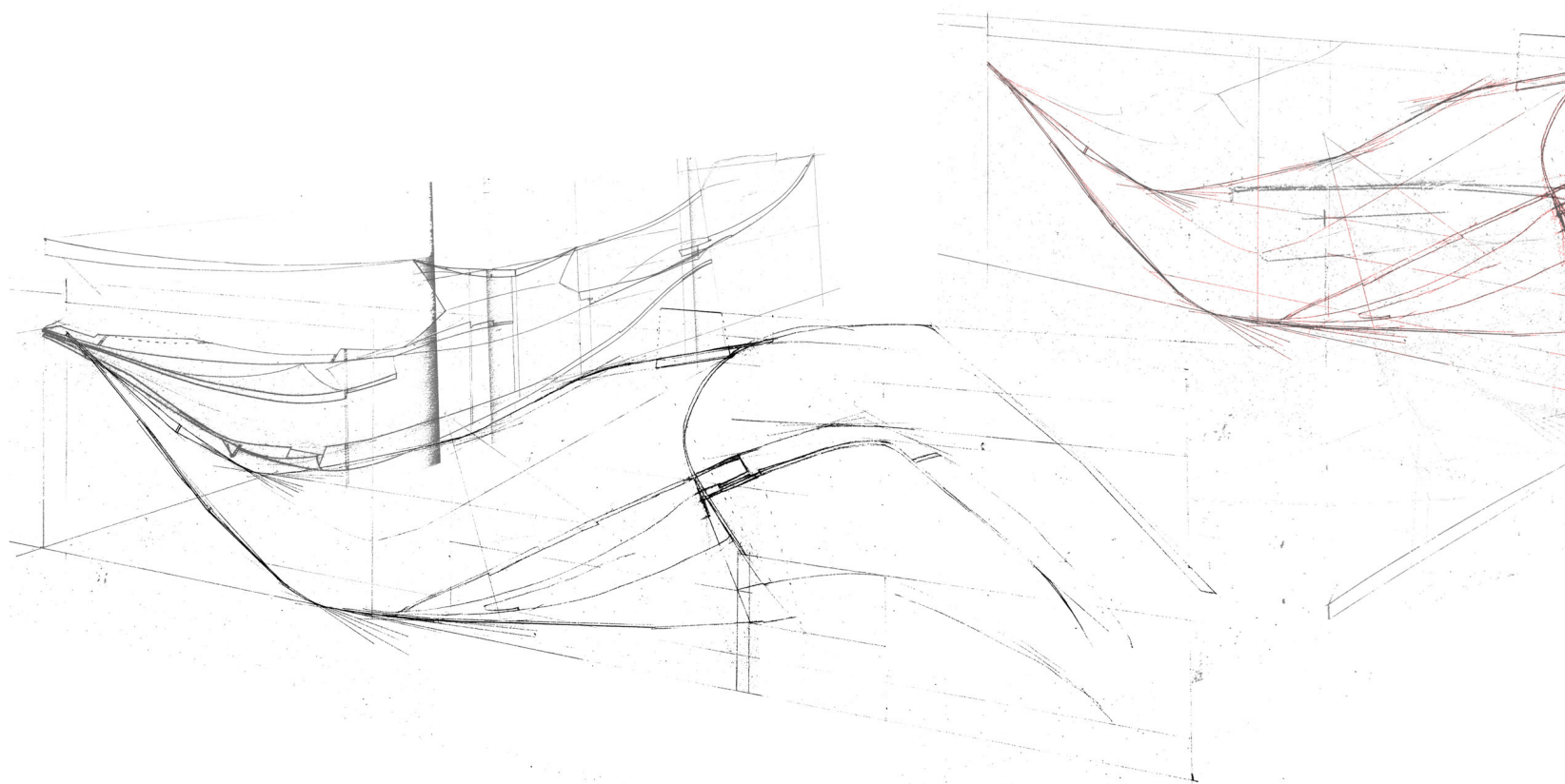
The sections on the adjacent page place emphasis on the definition of space through the construction of material. This material language is a culmination of different interweaving systems. These systems move throughout the whole construction and are programmed using the terms identified in the earlier processes.

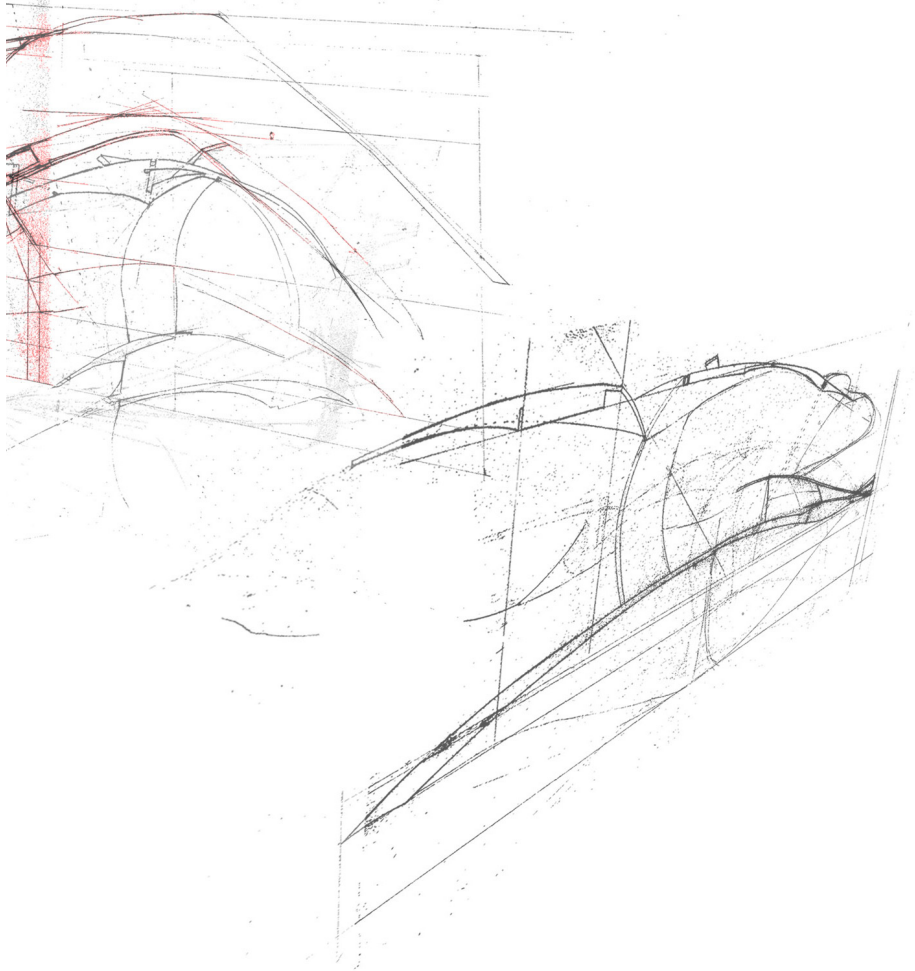
The first system of wrapping structures the curvilinear form, working in conjunction with the pleats that transform the two-dimensional pattern.

The second system of weaving moves beyond the surface, interacting with the three patterns. Weaving is used to structure the space, allowing the patterns to hold their form amongst each other.

A third system of pleating is not only used to construct the surface, but also an integral part of the linear language. Pleating becomes the reaction to the systems of weaving and wrapping.

In addition to structuring the quality of the interior space, these systems react to the surface manipulations as well. The surface of the two patterns that construct the overhead and underfoot are constructed with spatial relief. This relief is much like the small scale models that are defined by the actions of constructing the Sari. Extruded upon the ideas that structure the linear system, they work in tandem with the construction elements within the space of the object.



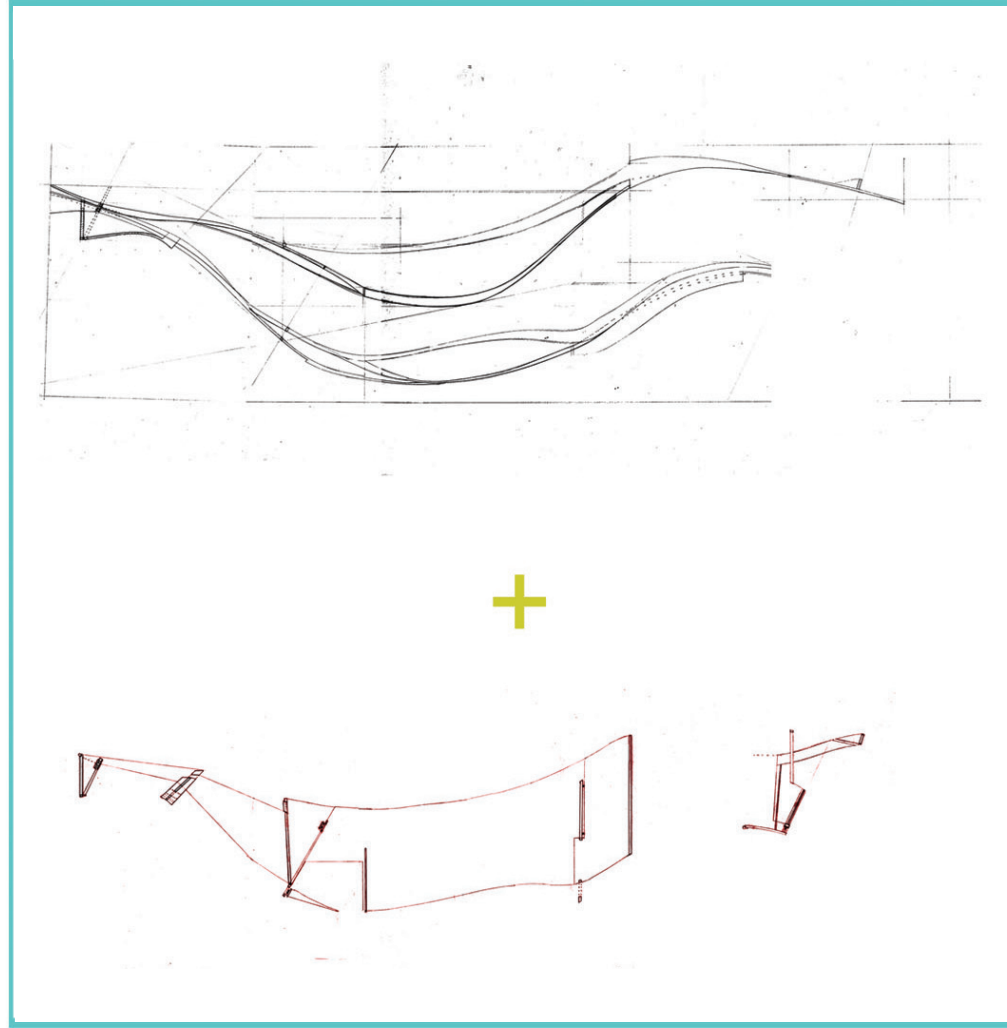


## three dimensional sectioning

Continuing sectional exploration, it became necessary to push three-dimensionalizing the space forward. In the next exercise, the sections were composed in a spatial axonometric to force an understanding to the interconnected spaces. What was learned was that the linear-material system was not yet strong enough.

## exploring space and material through structural systems

In the series of drawings that precede, the linear-material systems were explored. Building upon the existing ideas, new spaces were formed through the expansion and compression of dimensions. In addition, this system begins to evolve the perception of space and scale. It creates a definitive direction to how to interact with the space, emphasizing some volumes while placing less stress on others.

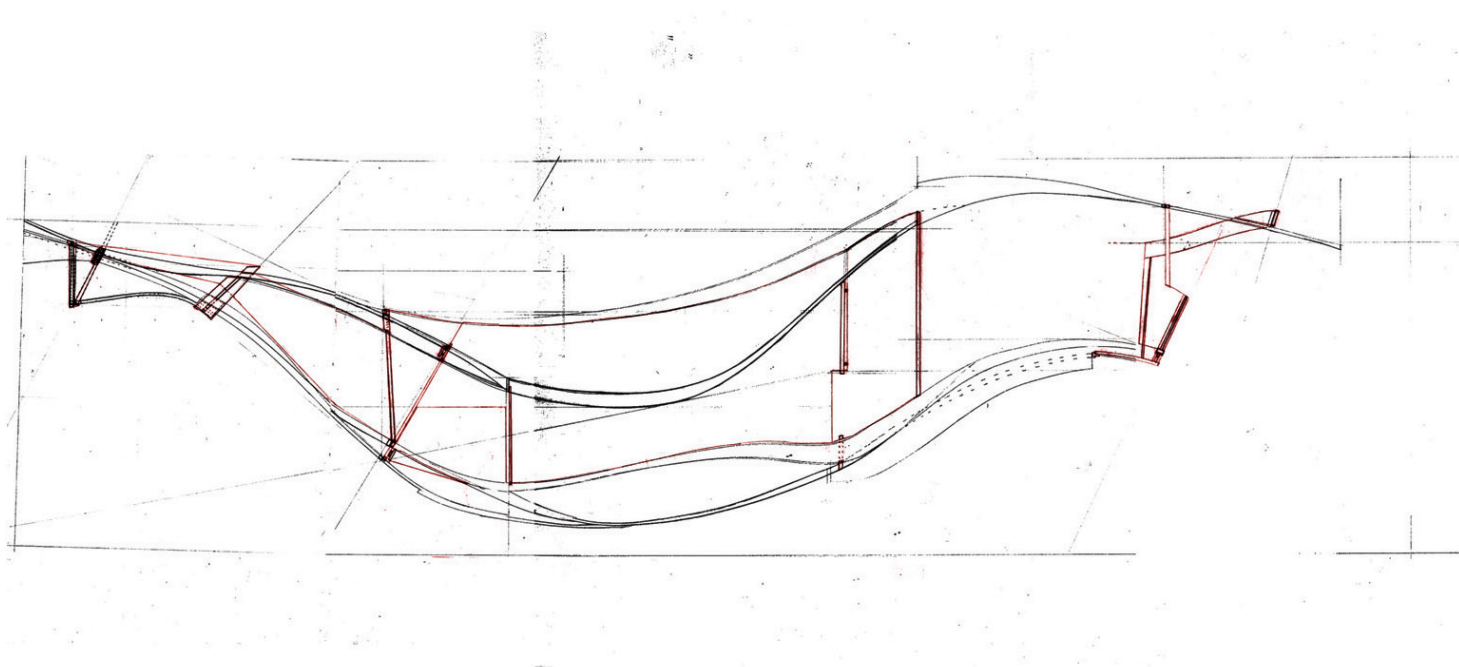


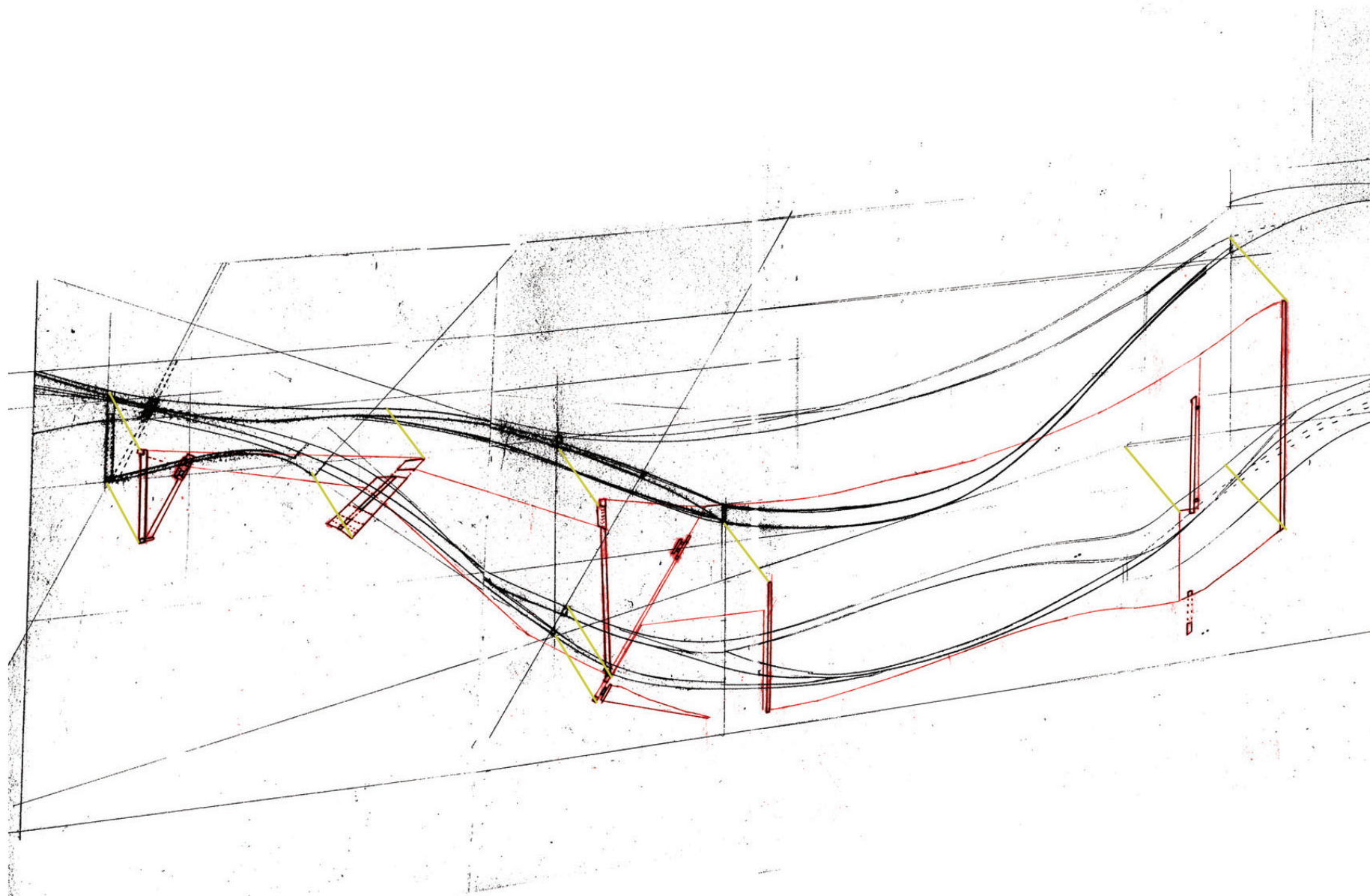


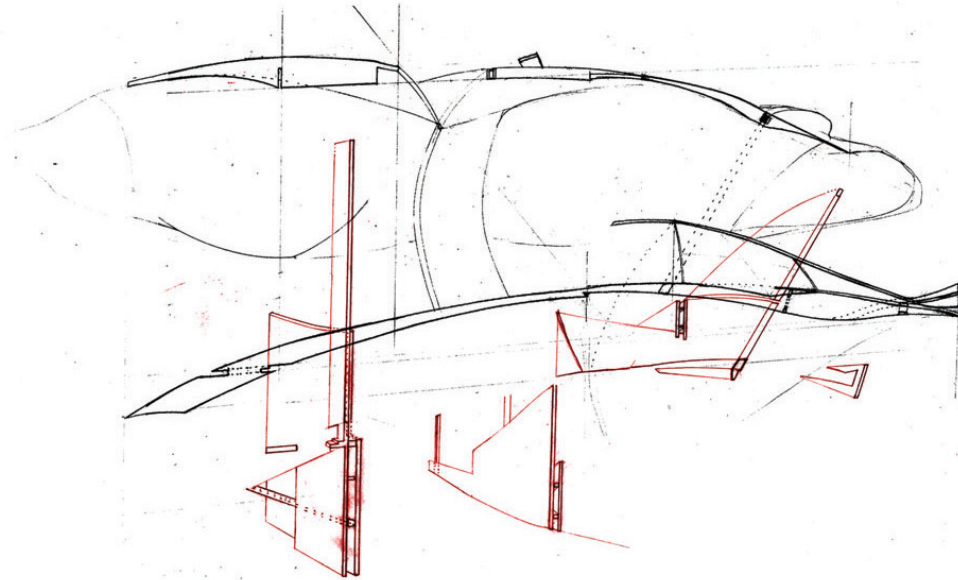
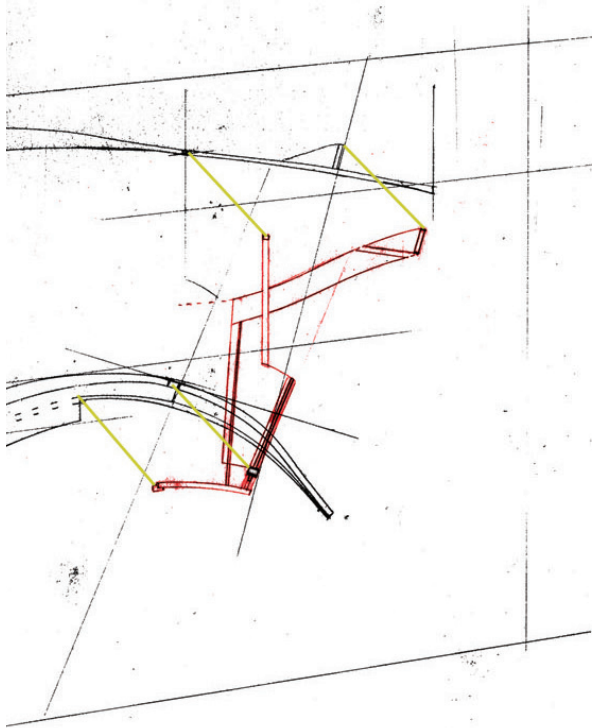
## imposing a secondary linear system

After drawing the linear constructions, they were then overlaid on the original sections. Assembled on a skew to the planar axis, these drawing emphasize movement inwards as well as outwards from the drawing. In addition, they draw conclusions on the construction of the space. Identifying

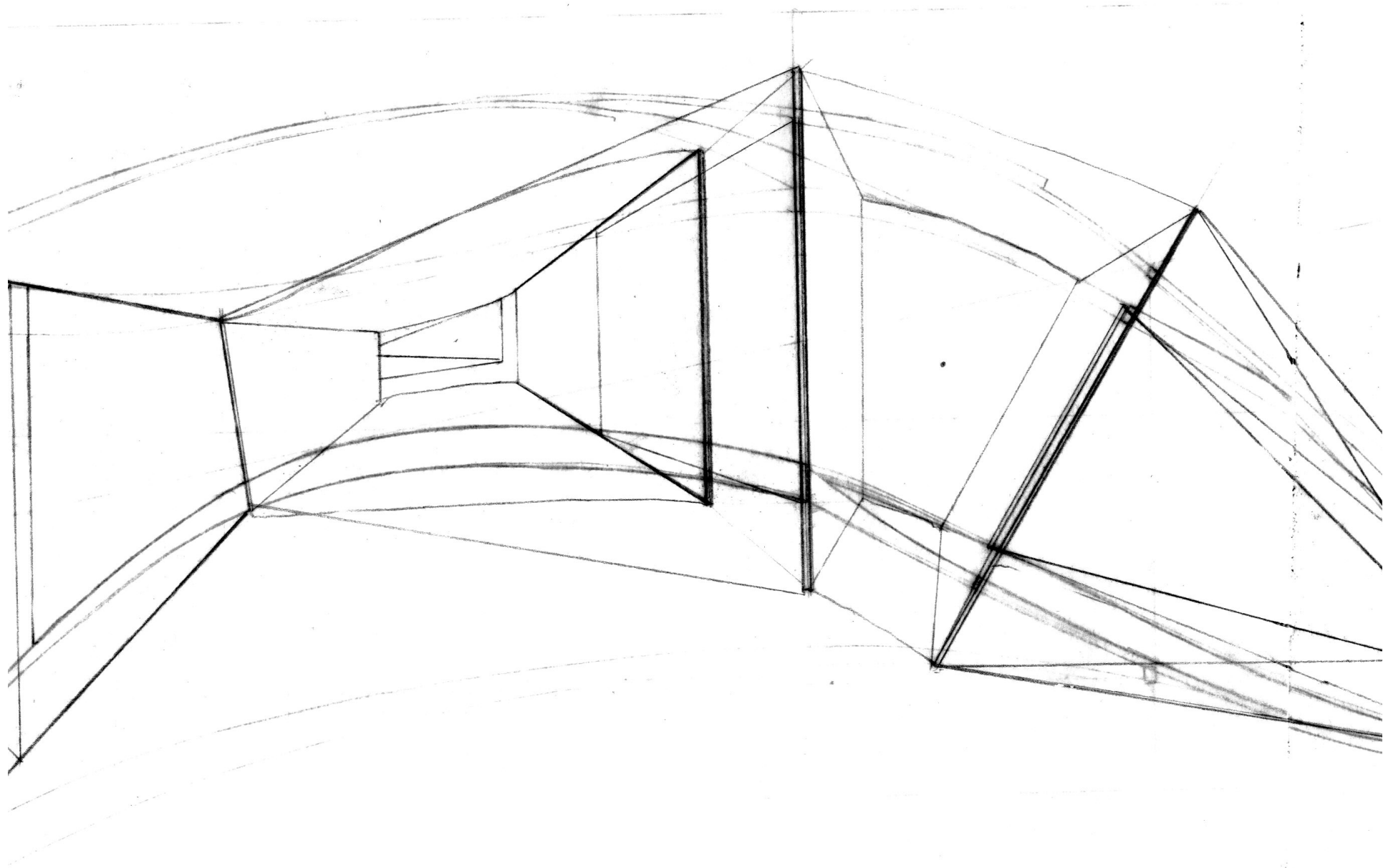
exact volumes that have the potential to be occupied at numerous scales. The spaces become dominated by architectural space while still maintaining the ideas of construction and organization that was found through the previous exploration of pattern design. The voids as well as the form express the predetermined ideas of movement, wrapping, weaving, and pleating.

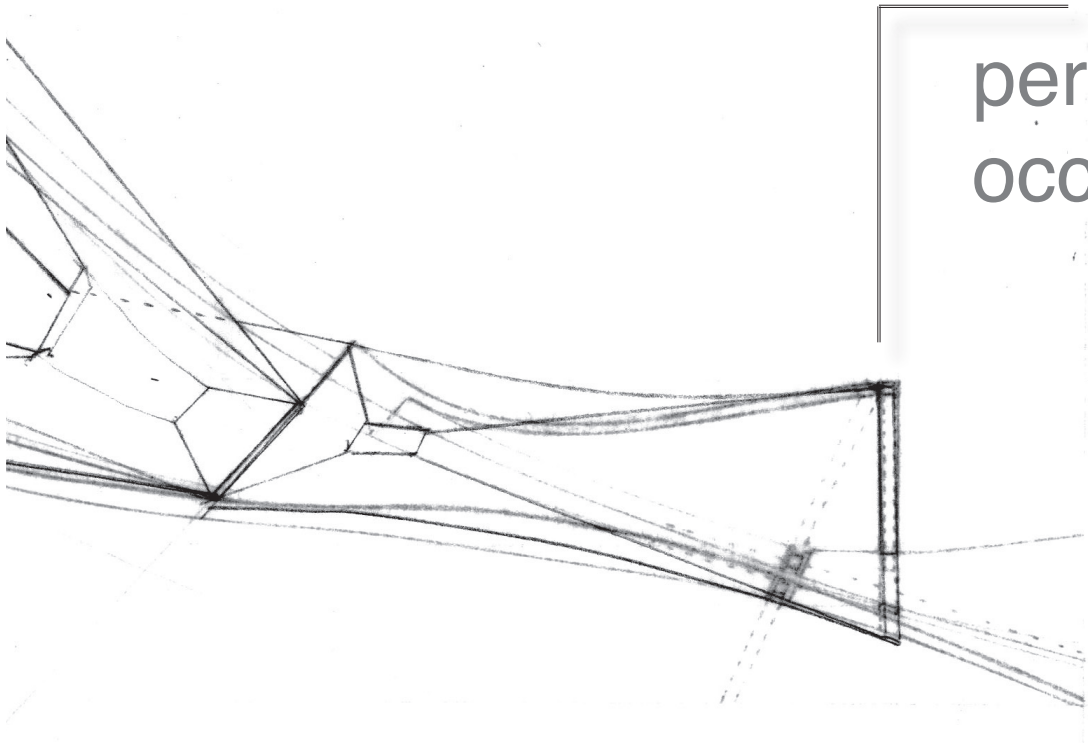






In these diagrams, the secondary linear system is extruded from the original section. This exposes the connection of this examination to ideas of dense material construction that form space. These elements also begin to offer ideas of scale through the layered construction of interlocking elements





perspective space +  
occupation

The image features a detailed architectural sketch on the left side, rendered in black lines on a white background. The sketch depicts a complex perspective view of a space, likely an interior or a landscape. It includes several geometric forms, such as a large, irregular polygonal shape on the left that tapers towards the right. A series of lines converge towards a vanishing point on the right, creating a sense of depth. A rectangular structure is visible on the right side of the sketch, possibly representing a building or a platform. The overall composition is minimalist and focuses on the spatial relationships and perspective.

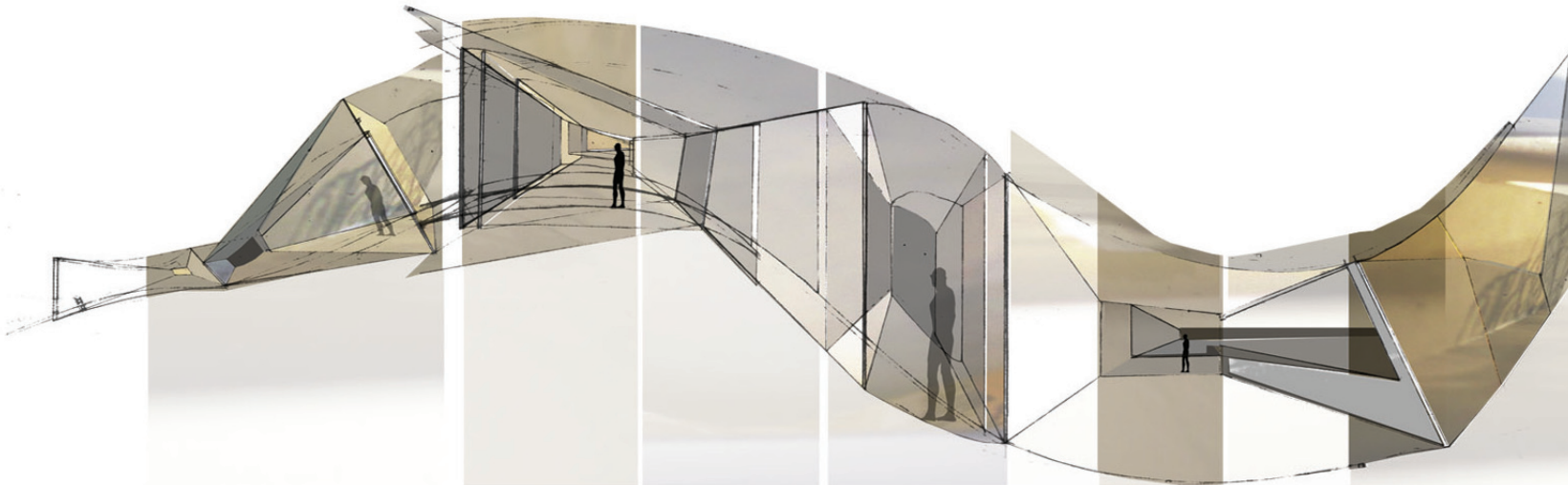
## forcing perspective

Perspective is utilized to construct architectural space, it forms a perception about occupation and begins to reference a scale. This allowed the multi-functional object to be read architecturally. Through perspective, the shifting scales of the patterned object were realized and the material qualities emphasized.

The perspectives were derived from the architectural sections through the spatial object. These diagrams were constructed in conjunction with many of the ideas that were found and explored throughout the process. After

establishing ideas of space formed from the analysis of the Sari and the intersected material systems, the process of emphasis, expansion and contraction of space began. The vanishing points was chosen based on the scale and interaction of each space with the linear system. The perspective forms to the curvilinear form of the object to enhance the ideas of movement, wrapping, weaving, and pleating that are inherent in the construction.

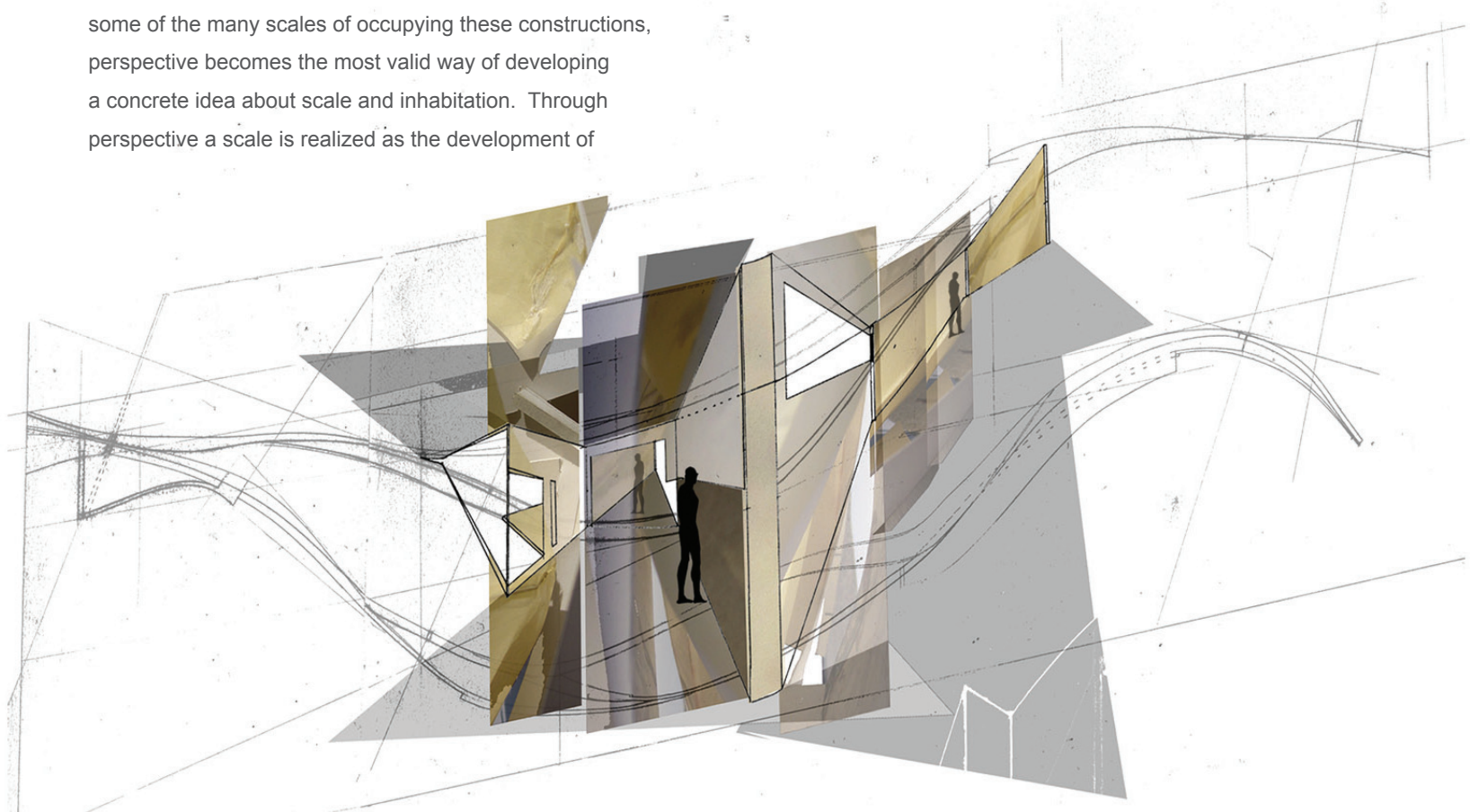
After constructing the perspectives, collaged images were used to emphasize the movement and transition of space. These investigations were based off of the patterned spatial construction.





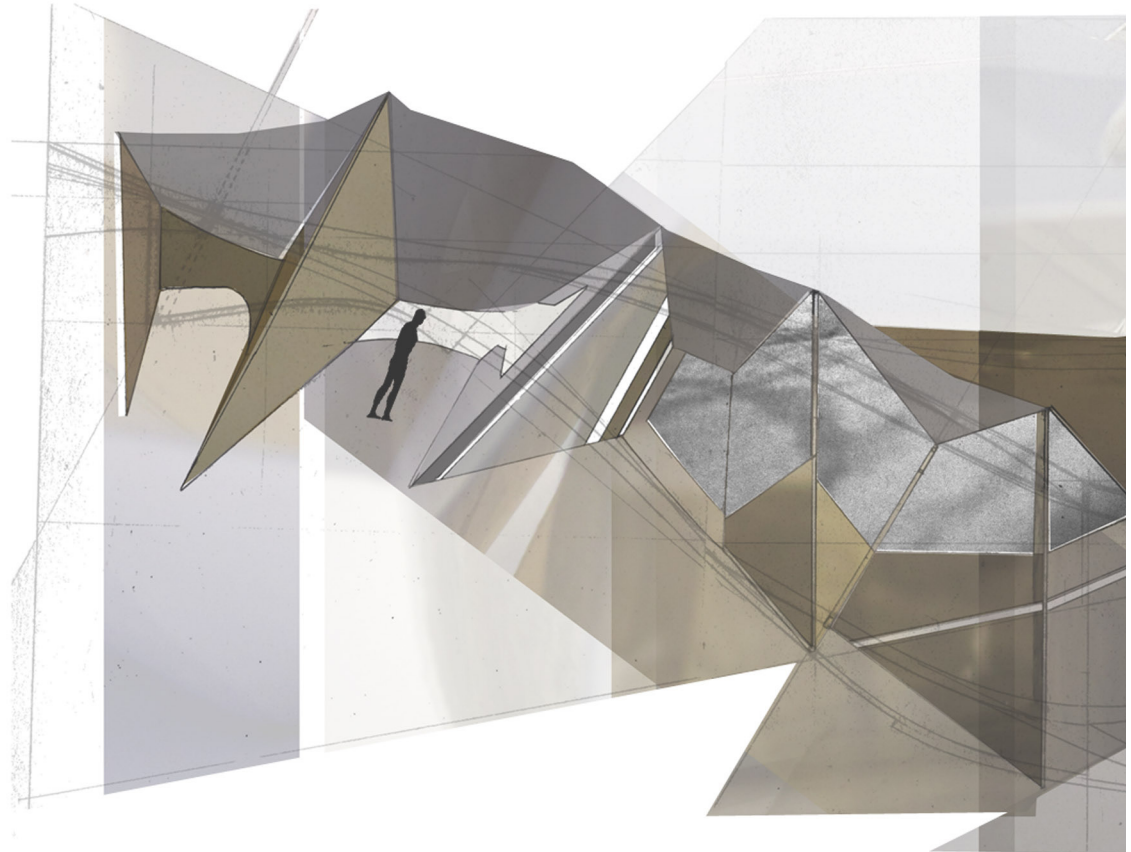
Scale is essential in the development of architectural space. As a result of this process and the need to identify some of the many scales of occupying these constructions, perspective becomes the most valid way of developing a concrete idea about scale and inhabitation. Through perspective a scale is realized as the development of

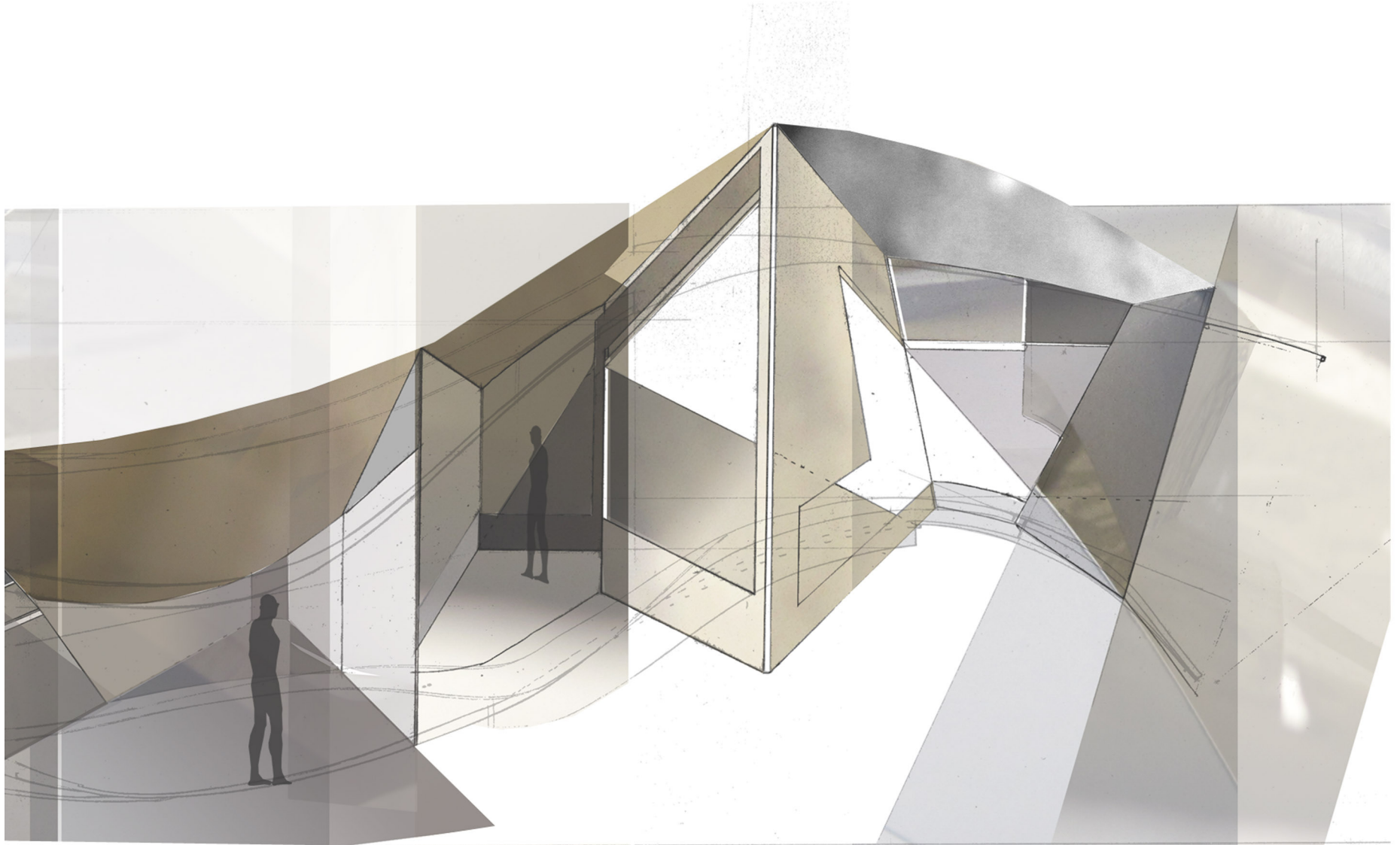
complex volumes are formed. The scale in this investigation is very much architectural and dependent on the convergence of the material systems.



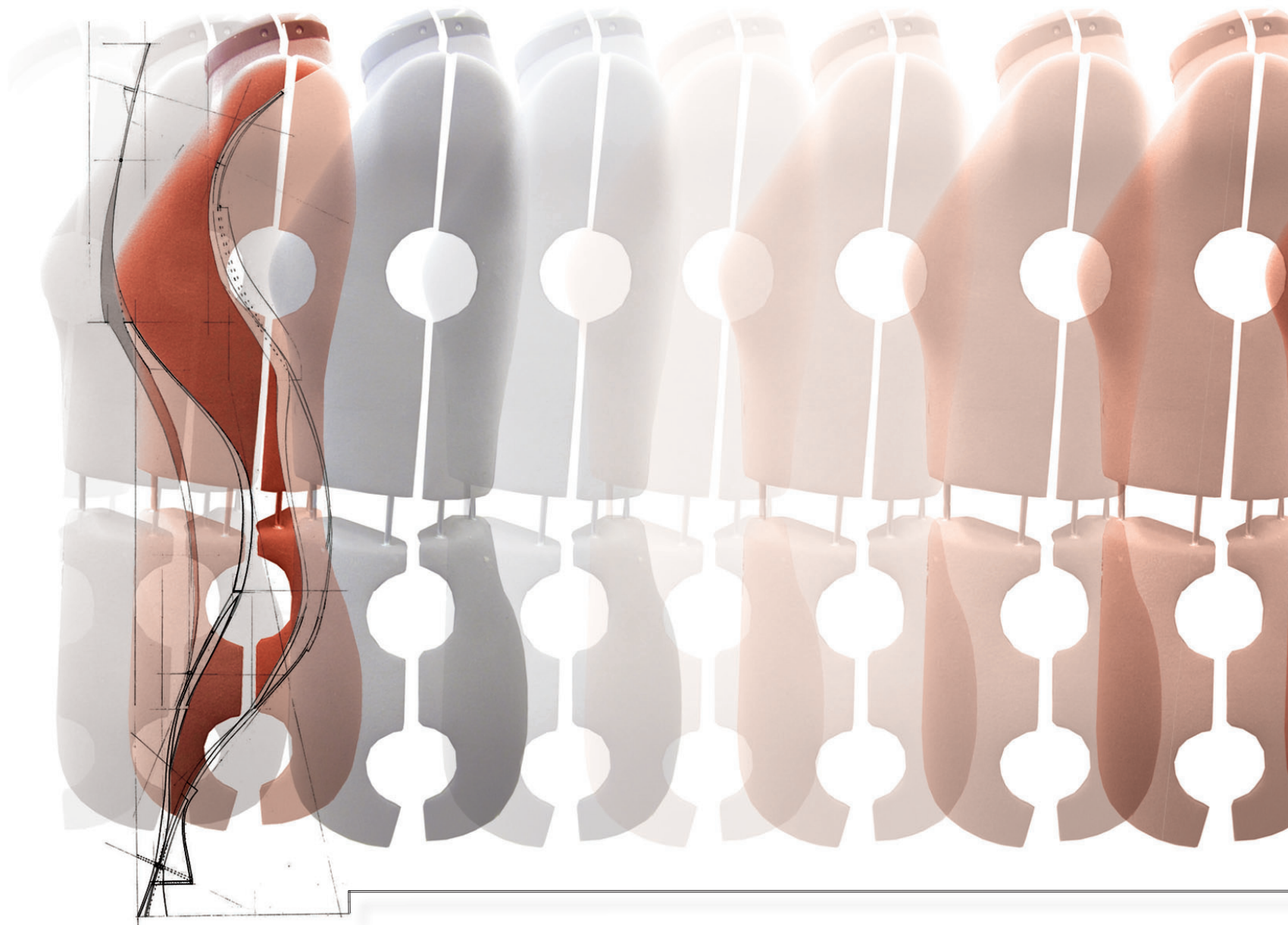
Through perspective, the shifting scales of the patterned object were realized and the material qualities emphasized.

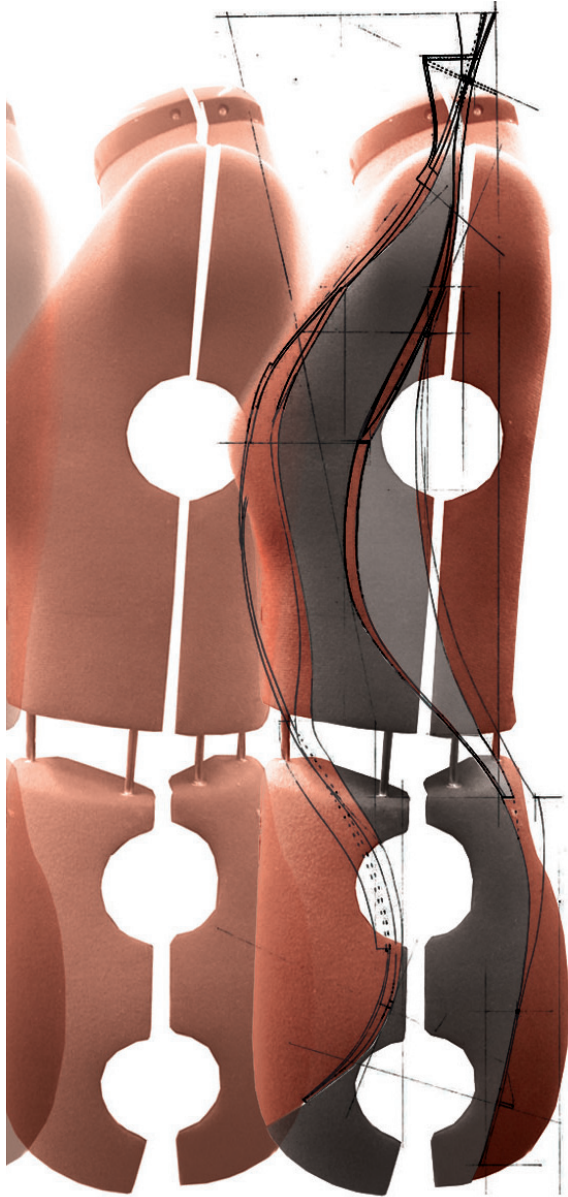
Extruded perspective :: an examination of space in three-dimensions constructed in consideration of ideas of material, space, and structure. These perspectives were derived from the sections of the model, extruded into space based on the process of construction and analysis inherent in this project







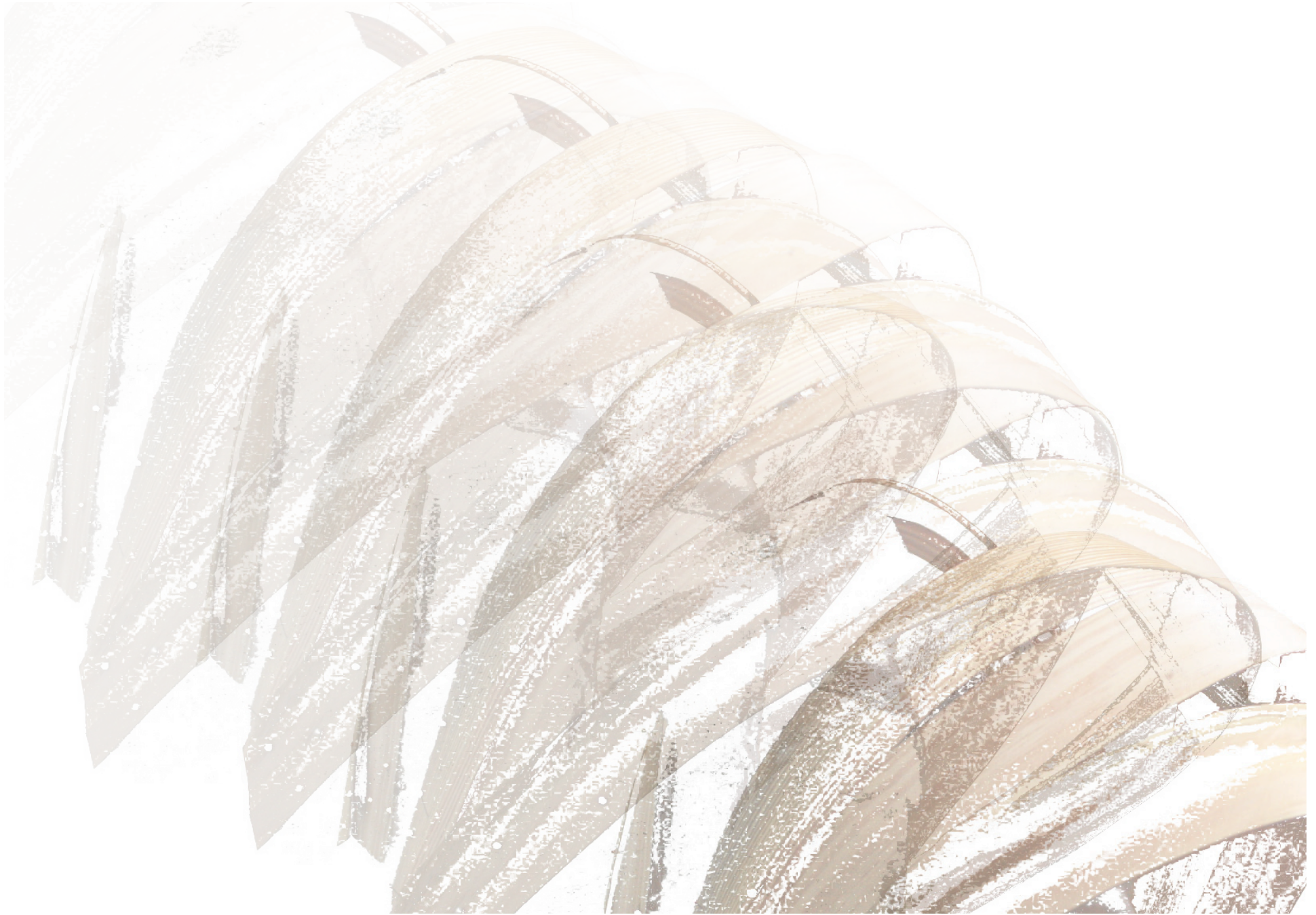




## conclusion

works cited + acknowledgements





“The signified is not constructed by means of an order but by means of pieces that may ultimately touch; that approach one another, at times without touching; that draw nearer to one another yet never make contact; that overlap, that offer themselves in a discontinuity in time whose reading as juxtaposition is the closest approximation to reality at our disposal.”

-Ignasi De Sola Morales, “Weak Architecture”

This project investigated material and spatial design through a process of analysis and fabrication. The resulting constructions were a composition of architectural space and dress design that deconstructed two parallel methods of thinking. These methods were then translated into dense spatial constructions that exhibit ideas of both architecture and dress design. Existing in scales zzzzzzzzzranging from the individual form of the body to the traditional scale of architecture, this process can be used to think about the fabrication of material space. Space that is constructed through a system of interweaving languages.

## the archeological construction of material and space through “Weak Architecture.”

Material was explored and realized in conjunction with the study of space. In fact, in this process I have found that the idea of material constructs space. The material identified throughout this process is fabricated from a dense linear system established by organizational and functional terms identified in the deconstruction of the Sari.

Both the Material and Spatial systems were constructed upon the functional terms of wrapping, weaving, pleating and embrace that make up the operations of assembling the Sari. In addition to acting as organizational elements in the process, they can be used to define the intricate fabrications in the final part of this journey.


## scale and occupation

Scale was always an important organizational figure utilized throughout this process. The project began with the idea that the resulting spatial construction of this research and analysis would be multi-scalar, in this sense the spaces could be occupied and different magnitudes. I began with smaller scale analysis of the individual Sari and transitioned to fabrication that occupied many scales, but it was through









sectional analysis and the extruded perspectives the space of the object became architecturalized. At this point, the project began to juxtapose the form of the body against the traditional scale of inhabitable architecture. At the same time the shape and form of the spaces allowed for numerous shifts in the scales of architecture.

## practical applications to contemporary design

### architecture

Architectural design is continually searching for new ways to define space. This process of design that has been defined has the ability to transform the way space is constructed, perceived, and occupied.

### applications

This process resulted in the construction of patterned space. Constructing space through this method of design would allow for less determinate space. Meaning, what is designed and constructed could observe different scales of occupation that exist in a logical system of connection. These different scales of occupation allow for the development of a systems of interweaving languages, that have the ability to influence the dynamics of architectural programming. This system of

interweaving, connecting space has been identified through the process of designing material. Material has been defined in this process, as a constructed system of languages that effect spatial perception and occupation. It has the ability to transform the way space is occupied and perceived. Essentially material has the ability to act as a catalyst in construction parts that exist in juxtaposition to the whole.

### dress design

Dress design is a intricate process of constructing space against the body. What is absent in this field today is the exploration of joint detail. Through this process I have found that by utilizing the pattern and the architectural idea of space, a new material language can be created. This language stems from the idea of “material,” that was identified throughout the progression of research. Material in dress design, takes the form of pattern and has the ability to be constructed to expose the joints of the body and construction. This would result in the amplification of the importance of the body and the method of structuring the seam.

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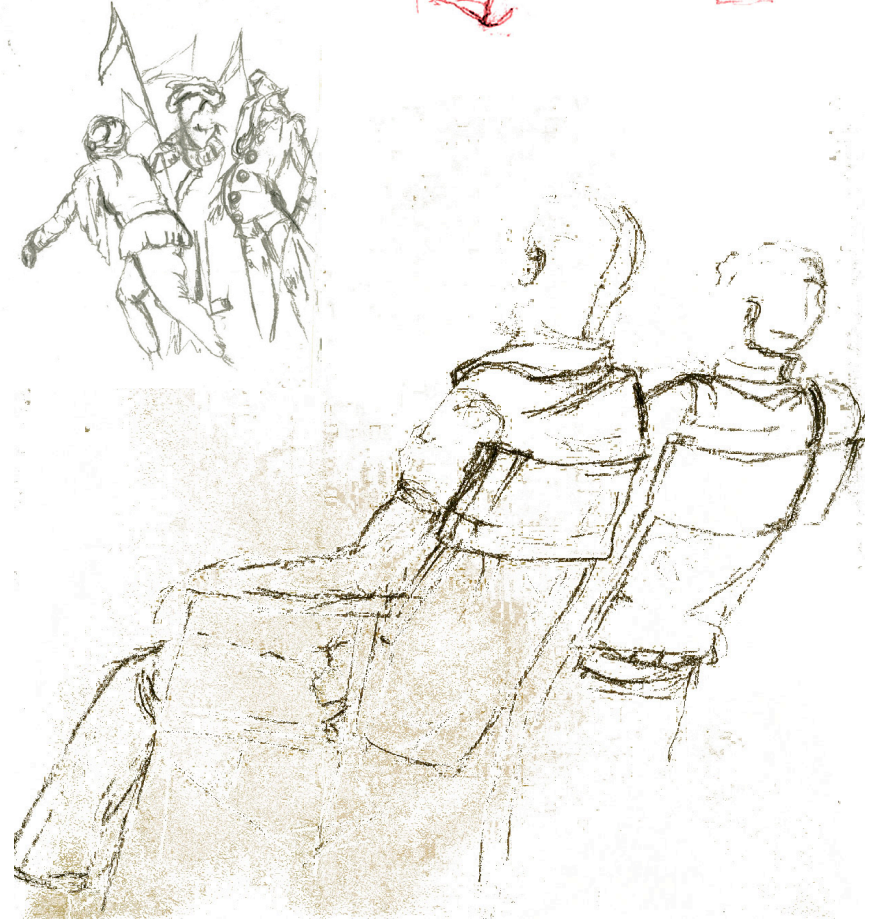
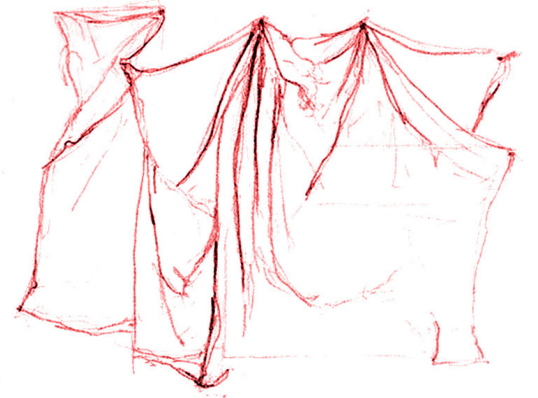
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# inspiration

personal sketches

