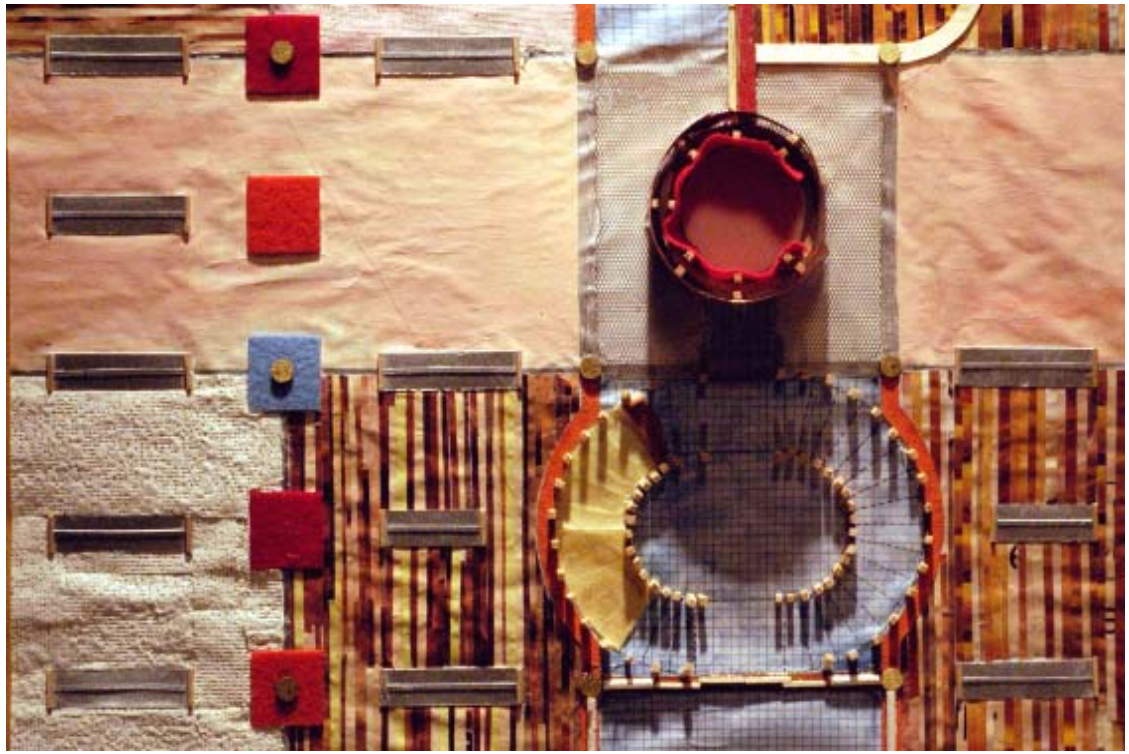
Reading skins:

Proposal for a Braille learning facility in Old Town Alexandria



Abstract

The resonance of a knock on a door uncovers its density.
The smell of a wall describes its materiality.
The texture of a floor may invite us to sit or lay down.
The smoothness of a handrail comforts our ascent.

Human skin is a powerful material that enables us to perceive and understand our surroundings. Skin is highly expressive; based on its color, texture, wear and plasticity we can read it, gathering information concerning culture, ethnic background, age, abuse, health and the tasks it performs on specific body parts. Skin itself reads as it is readable. Our skin can gather data through tactile perception and read our spatial surroundings. Architecture is an expressive act and the only discipline that stimulates all of our senses. An architect designs spaces that foresee and celebrate the bodily interaction of the inhabitant.

The architecture of the 21st century seems to be geared toward a more optic experience, an influence of the digital world and its widespread effect. The architectural body of modern construction is made up of skins that convey no intentions of interaction between human skin, delivering a concoction of low quality materials that time and again are layered the same way and only aim to be cost efficient. The result is a bland, empty and "flat" experience. In a culture dominated by visual stimulation, can the design of architectural skins aid in the reading and understanding through touch of an architectural body's spatial sequence?

Introduction

The influence of the digital world results in an overemphasis on seeing as the primary sensorial activity. It seems that modern technology has blurred the line between the physical and the virtual. The desire and satisfaction of touch is substituted by the gratification of images and the artificial. This reliance on vision eventually leads us away from our bodily understanding and our physical engagement of the world.

If our vision were to be impaired, our understanding and contact with the world could only occur with the use of our sophisticated sense organ, the skin. The skin gives us the ability to sense things through tactility. Tactility encompasses touch as well as smelling, hearing and tasting because they are essentially acts of touch. We smell because a scent comes in contact with the skin in our nose; we hear because the skin in our ears comes into contact with vibrations in the air; we taste because the skin on our tongue comes in contact with a substance. It is the very substance of our skin that possesses a coherence which enables it to be such a successful information-gathering device and bear such a unique materiality.

Skin is a complex multilayered, multipurpose material; besides being the medium that harbors touch, it also protects us from the rest of the world by preventing, controlling, regulating and sheilding everything from abrasions, fluid, harmful substances or microorganisms, and body temperature.

Fig. 1 Times Square, NY- a cacophony of neon signs, huge screens and zipping message boards is displayed at this mecca of digital media

Fig. 2a,2b Virtual information transfer lacks the tactile qualities of traditional media

Fig. 3,4,5 Sensory stimulating activities such as smelling a flower, painting or playing an instrument contribute to an awareness of reality and ourselves

Skin's protective function is a result of a harmonious arrangement of four basic layers:

1. Epidermis- the outermost layer, a thin sheet of self-replacing dead and dying cells rich in keratin (sulfur rich, water and bacteria-repellent protein), which is the ingredient that mainly protects us from the exterior world.(Fig. 6).

2. Dermis- a thick, vascularized layer that lies beneath the epidermis consisting of a mesh or scaffold-like structure of collagen and elastic fibers. It also houses melanocytes which contribute to skins color.(Fig. 7)

3. Hypodermis- the layer below the dermis that is also named the superficial fascia; it is essentially a fine layer of white connective fatty tissue, which softens the contours of the skeletal frame and provides insulation against cold.(Fig. 8)

4. Deep fascia- meets the superficial fascia (Fig.9); it is a vast thin fibrous membrane, devoid of fat which wraps all muscles, blood vessels, nerves, joints, organs and glands, like a silk-like "safety blanket" to prevent wear and tear.

Although the materiality of the skin is constant throughout the landscape of our bodies, its texture can shift dramatically. The skin conforms to the demand of our various body parts; thick and hard at our soles and our palms, thin and soft at the eyelid and very elastic and crumpled at our elbows and knees.

Fig. 6 Epidermis

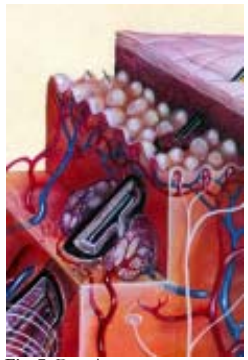


Fig. 7 Dermis

Fig. 10a The substance above is Apligraf, a skin product that has two living layers. The "epidermis" protects from infection while the "dermis" stimulates growth of new cells making it an ideal skin substitute burn victims. The "tissue" is cultivated in a bioreactor.

Fig. 8 Hypodermis

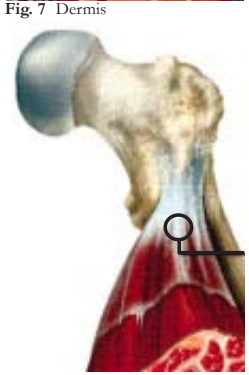


Fig. 9 Deep fascia

Fig. 10b The look and feel of synthetic skin can be very convincing but no one can reproduce skins incredible ability to connect us to the world through touch. (Mask extracted from online portfolio of artist Thomas Foldberg EFX)

Whether it's under our soles, over our eyes, or around our elbows, the texture of the skin provides individuality and identity. This uniqueness is not only accounted for within our own bodies but also between human beings; the texture of our digits creates a pattern of marks known as fingerprints which are different for every human.

Structurally, skin is a material that entirely depends on a frame to compose its form. It possesses no shape of its own, but instead takes on the shape of the frame that it is wrapping, covering and protecting. This idea is clearly presented in an illustration by Nicolas Beatrizete Corche where a man is completely devoid of skin, revealing his muscular anatomy. In one hand he holds his draping, shapeless skin like a robe while the other clasps the sharp dagger with which he has accomplished the "undressing" of his figure.(Fig.15)

Incidentally, skin has a likeness to the function and qualities of fabric and clothing and has been called "a woven mantle"(1), protecting our organs. This comparison has been interpreted through the work of Alba D'Urbano in The Immortal Tailor. "D'Urbano has created a series of garments that cover the body with photographic images of itself."(2) The artist clearly establishes a link between the expressive and protective qualities of skin and clothing.(Fig.16) The body's "mantle" is essentially a human canvas. Its appearance can be highly informative of ethnic background and culture. The Nuba tribe of Sudan uses the skin to commemorate and document the passage to womanhood on female members; with every attained stage their backs are progressively cut with special tools into a pattern of tiny nicks that

Fig. 11, 12, 13 Our versatile "mantle" provides texture and thickness throughout our body in response to different tasks

Fig. 14 Humans are genetically "tattoed" with unique fingerprint patterns

Fig. 15

Fig. 16

scar as bead-like bumps on the skin.(Fig. 17,18 &19) The passage of time is also "advertised" as the skin slowly loosens and folds into wrinkles caused by a deterioration of elastic fibers and collagen in the dermis. Consumers worldwide make huge investments on products to deter aging, improve texture, tautness and radiance. Those with the most minor skin disorder evoke the appearance of illness and weakness. Society has a tendency to connect physical healthiness to skin's appearance because it is difficult to accept that something is wrong with the organ that we rely so much on for protection.

As it protects our fragile organs it also provides a homogenous almost uniform mask that hides our grotesque and gruesome interior. The dismantled "skin" of a doll uncovers its robotic makeup into an undesirable sight as much as anatomical depiction can arouse a natural repulsion.(Fig. 20a, 20b) For centuries unveiling the "mantle" was taboo and considered sin. "Around the 1300's the church ...issued its first dispensations, and little by little a reliance on dissection became widespread in Europe...But an anatomical examination...was destined to be forgotten if it was not depicted in an image. Thus as the distaste for autopsy dissipated, so too did proscriptions against anatomical illustration, and by the 14th century, a new generation of physicians undertook dissections in close collaboration with artists...For a long time death had been seen as an obstacle to examining the body. Now it had become the very condition for objective knowledge."(3) During the Renaissance the artist transformed the morbid specter of anatomy into beautiful works of art.

Fig. 17

Fig. 18

Fig. 19

Fig. 20a,20b

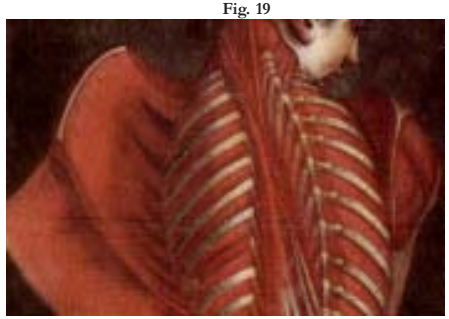


Fig. 21 The skin of the woman in this illustration is peeled so as to appear to be winged, like an angel; this type of drawing was the expressiveness artists sought in order to soften the horror of anatomical dissection

Project Thesis: Tactility in architecture and drawing

Tactility is an ability that develops early during embryo development, when our skin nerves connect to our brain and transmit information concerning pressure, temperature and pain. Although we live in a world of surfaces, our interaction through touch has slowly decreased, making way for purely visual experiences from the digital world. Society in general ignores the power of tactility that evolution has gifted us with. It is apparent that humans can live without most of our other senses. But it has been proven crucial to survive, especially in babies, that nerve connection between skin and brain are the portals to thriving and dodging possible death.

Employing tactility can enhance our sensitivity toward people and things, and our bodily dialogue with space. Humans are constantly exposed to and in dialogue with buildings. Though architecture stimulates equally both tactile and visual engagement, architects rarely give importance to all the senses. Most designers do not consider, for instance, the feel of touching a door knob, the echo of footsteps on different floor materials, or the odor of air in a plaza. Architects have slowly fallen into a "retinal world" when it comes to conceiving space. The exclusion of tactility as a major participant in spatial design has affected the practice of architecture presenting us with fixed, flat, static and cold pictures. With no plasticity, no connection or association to our bodies they inevitably are isolated and distant to us. It seems that this distancing from the sensual occurs beyond

Fig. 22 The popularity of video games has steadily increased making it the favorite toy and activity of the digital information age among children and teenagers, with tv watching as the secondary activity of choice.

Fig. 23 Touching can be a life saving act;. studies reflect that premature babies have a tendency to recover quicker if touched frequently.

Fig. 24a, 24b, 24c In an experiment intended to prove how dominant vision and touch are against each other, subjects were exposed to an experiment that involved feeling objects inside a black box with their hands, then describing their properties before and after seeing them. In the first round the subjects described the objects mainly observing texture, weight, density and shape. In the second round the observations differed as subjects immediately described color, disregarding all other properties, after seeing the objects. Color is entirely visual, as it is an experience perceived through absorption of light in various wavelengths. The experiment suggests that vision can sometimes dominate when experiencing and observing things.

architecture and is reflected in our culture as well.

This importance on plasticity might feel trivial to an individual that possesses vision but for visually impaired individuals being able to identify surfaces through tactility is why they function and survive. For instance, the floor of some subway stations in New York City are paved with a yellow bumpy tile at the edge of platforms.(Fig. 27) The color yellow immediately would indicate caution for someone that possess sight, but for the blind individual it is crucial that the texture of the tile is exaggerated in order to sense an alertness. This is the type of gesture in spaces that can be taken as a premise for the design of buildings. Blind people tend to extend their arms and use there hands for guidance and to survey a space. Elements in an architectural body like walls, floors, handrails and doors can act as a stage set for touching. Therefore the skins of an architectural body can aid in the reading of it spatial sequence through tactile perception rather than solely on vision.

This is relevant in terms of the goal architecture intends to offer, the creation of spaces sensitive to mankinds' needs, so it cannot exclude individuals that lack the totality of their senses. This is especially imperative for the visually impaired that depend highly on tactile perception because it compensates for their inability to see. They experience the world with their skin through touch. The process is called cognitive mapping, and it is essentially the action of engaging tactile senses to create a mental image. Visually impaired individuals should receive intensive stimulation of their senses as early as possible to ensure survival. It becomes crucial for them to therefore learn to

Fig. 25a The collage intends to show a correlation between the behavior of human skin and an architectural skin in a building. An image of a portion of the Gugalun House by architect Peter Zumthor, shows the moment the existing aged material meets the fresh new material used in the addition of the cabin. The image is then layered on a face that is half youth, half aged, establishing a similarity between the plasticity of skin and natural building materials exposed to the environment and time.
Fig. 25b,25c The entrance to the *Fondazione Querini-Stampalia* in Venice, beholds a bridge designed by Italian architect Carlo Scarpa. The choice of materials for the bridge reflects a sensitivity and an understanding of how object and human meet. A steel skeleton is inhabited by wood sculpted and treated differently, one for the floor and the other for the handrail. The feet, which are usually covered with shoes, come into contact with unrefined wood planks on the floor which are rough, dull and flat. Meanwhile the handrail is sculpted and curved to please the bare hand when grasped. The wood is shiny, smoothed and coated to safely allow caressing.

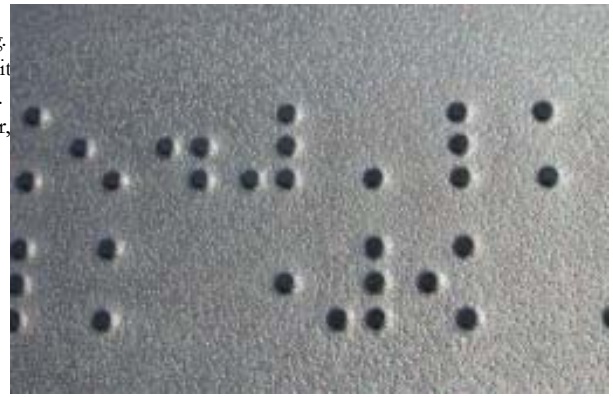


Fig. 26a, 26b Our fingertips are actually one of the two most sensitive areas of the body (lips being the other). Because our fingers are equipped with hundreds of nerve fibers we have the ability to control pressure and recognize subtlety's in textures. In order to "read" Braille, these abilities are essential. The Braille character is a cell composed of six dots, arranged as columns with three dots on each column. The dots are approximately .02in height.

read Braille, which is essentially the act of reading a skin through touch. Braille is a system of raised dots arranged as two columns (three dots per column) referred to as a cell. The different patterns between the dots within each cell and the combination of cells is what creates a readable tactile code.Much like Braille, this thesis aims to create a tactile code within a building through the design of its skins. The reading of these skins will engage the user through tactile stimulation throughout the building and facilitate an understanding of its spatial sequence, its materiality and its conceptual genesis. The conceptual genesis for the skins of the proposal came forth as a comprehensive design that responded to three key demands, the functional program, the material program and the architectural program. The interaction between these is best explained by Valeriano Pastor who also establishes three 'realms' that guide the design procedure: "The architectural event can be seen as the result, or rather, process, of interaction among three 'realms'-the program, construction and use. Each has specific traits and operative modalities...but none can be independent without impairing the others. Each tries to take over, but non-systematic design can be imposed other than dialogue and conflict- as experience of participation has shown."(4) Similar to the realms of Pastor, the three programs work in unison and rely on each other to give coherence to the scheme. Each has a unique definition but in order to coexist they intertwine in a comfortable tension. The design of the skins in this thesis proposal respond to the three programs in the following manner: the functional program defines the purpose, the architectural program provides an

Fig. 27

Fig. 28a, 28b With the aid of canes snd guide dogs visually impaired individuals can become very independent

intention and the material program specifies a substance. The **functional program** of the skin is to provide unity, enclosure and protection. The **architectural program** of the skin intends to provide a code, a means a of identification from space to space in order to establish a recognizable spatial sequence. Finally the **material program** will specify traditional, non-traditional, material and immaterial substances such as brick, vegetation, latex, memory foam, scent, temperature, etc

The interdependency between the demands of the three programs transcended into a reciprocal relationship between the architectural event and the architectural drawing as well. The method of representation used in this thesis detaches from the traditional pencil-paper medium. The drawing is not only meant to graphically describe the architectural event and the relationship between building parts and how they coexist, but to act as a direct manifestation of the tactile sequence. The architectural drawing would be completely inadequate if its reading was not through the act of touch. In a sense, the architectural drawing as a tactile code is also a skin to be read.

The tactility in the drawings came forth through repititious experiments with materials in the form of models, collage and sculptures. This three-dimensional approach proved to be the only means to foresee how elements in the building would feel, smell, react to pressure, how they would resonate or absorb sound, if they were cold or warm and how quickly they changed or deteriorate to touch.

The experiments were much inspired by works of art that

convey ideas through three-dimensional drawings. One exemplary artist is the team of Christo and Jeanne-Claude. Their work is mainly large-scale public projects; the designs involve wrapping, draping and suspending fabric around buildings or landscapes. The method of representation for these projects is through collage which aims to tantalize and convince the viewer by drawing a correspondence between thought and reality; "while they do not serve a truly propagandistic purpose, they do support, financially and conceptually, the projects that they describe. The collages may at first seem purely conceptual, even fantastical in the ostensible impossibility of the projects they propose, but this assumption dissipates once the focus on the process of the execution is understood. The technical information given in the collages and drawings is concrete evidence of their roots in the physical world. This data contains a quality that has led Christo to liken the drawings to architectural renderings."(5) The magnificence of his drawings are due to their huge size, their enticing colors and craftsmanship, the fact that they invite you to caress them, but most of all, their success lies on the fact that these drawings offer a fluid transition from thought to built form.

In addition to a fluid transition, the architectural drawings of the thesis had to demonstrate a dialogue between the body and the building. The Italian architect Carlo Scarpa used and mastered a methodology of drawing that reflected this dialogue time and again in his work. Marco Frascari comments on why Scarpa's work is so successful when using the human figure as an instrument that

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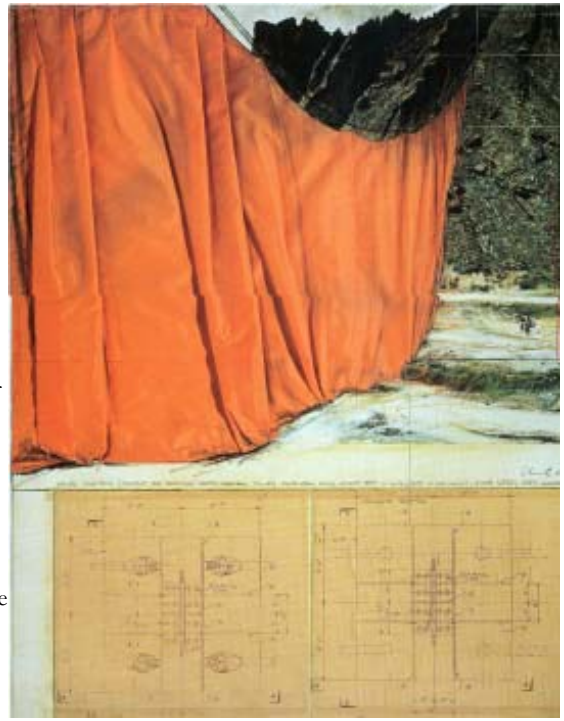


Fig. 29 Valley Curtain, Colorado

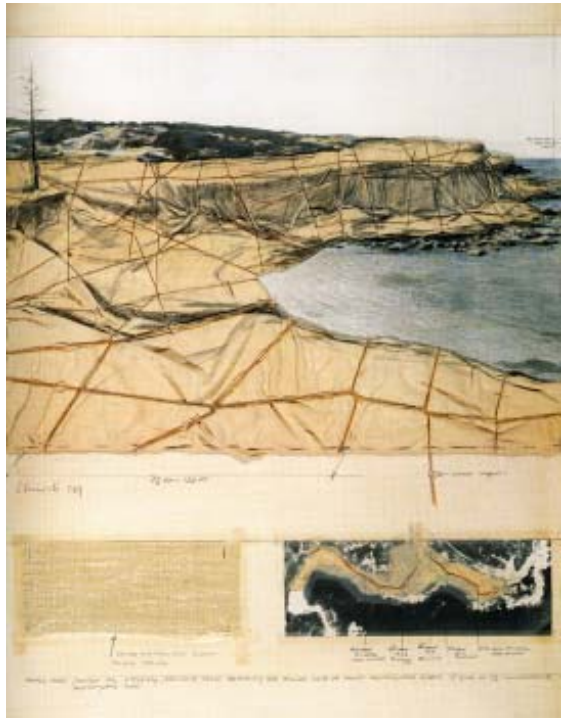


Fig. 30 Packed Coast, Australia

facilitates this dialogue and interaction with the built form:

"In Scarpa's architecture, the human figure is both the subject that produces the buildings *sub specie corporis,* and the object starting from which the building is made."(6)

"...a building is such because it is constructed by man and interpreted by means of human form."(7)

The plans, sections and elevations of the thesis project celebrated the body as the generator by addressing the interaction of the human force coming into contact with materials, texture, patterns, temperatures, sounds, and smells.

Architectural Ellaboration:

The site chosen is located between the terminus of both Prince Street and King Street along the Potomac River; the site is currently a passive park along the waterfront.(Fig. 31) It offers many subtle existing conditions, which possess strong tactile qualities: a gravel path, the scent of existing vegetation, a grass floor and the sound and smells of the waterfront, all intended to continue to have a strong presence, regardless of the intervention.

The soft, sweet-smelling grass floor is surrounded by an array of dynamic entities that flank and create its boundaries. The most dominant is the sound and smell of the Potomac River at the eastern edge. The sounds of the soft current that caress the waterfront are very tame, but splashing water excited by sea gulls and passing watercraft resonates at this place as well. Further interaction with the water is limited by the concrete edge of the waterfront that abruptly drops, keeping the water far away from reach.

A gravel path hugs the grass floor on the remainder of its boundaries. The sound that emanates with every step gives away your pace in a soothing rhythmic beat. Along the path you discover islands of pine trees, beds of flowers and groups of shrubs which occur only along the north and south edges. The vegetation meanders along the northern edge in unison with the gravel path. Beyond the shadows of the trees you see a low concrete wall that separates the park from an unpaved parking lot. To the south the gravel path cuts through a

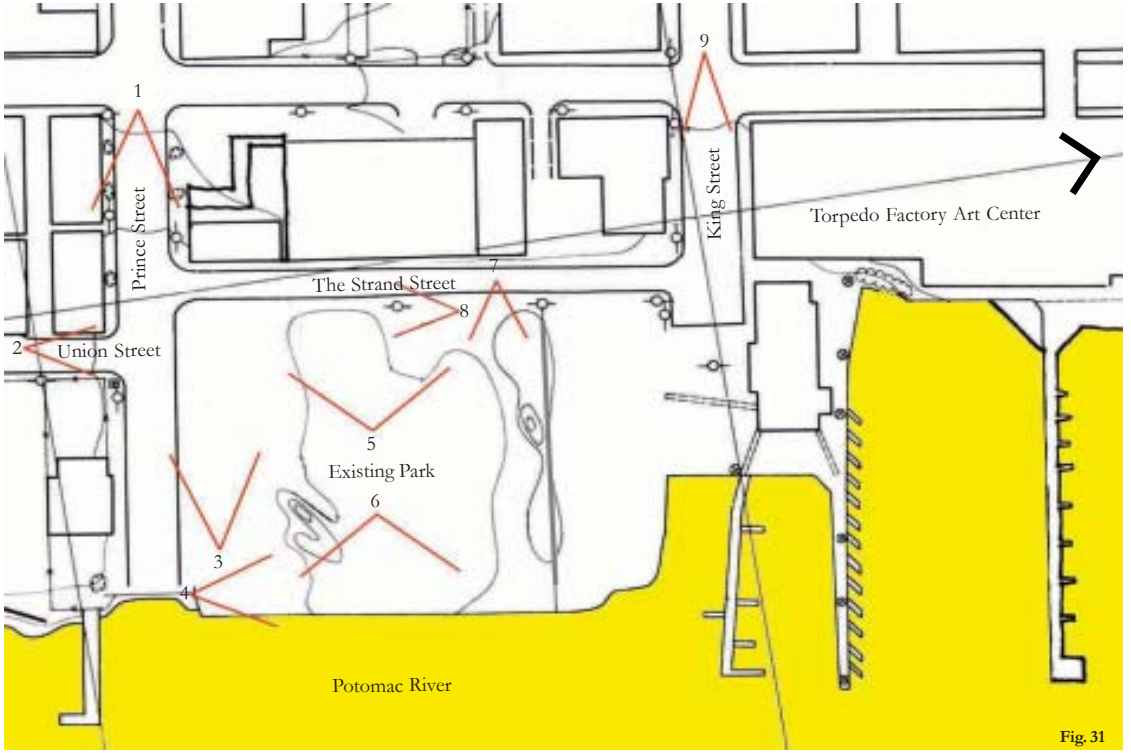


Fig. 31

1. Prince street cobblestone patch

2. Union street facing trees and brick ramp at park edge

3. Gravel path along south edge

4. Path at eastern edge meeting Potomac river waterfront

5. Edge along The Strand street

6. A definitive boundary is set by the existing buildings on the west

7. The eastern edge posesses a suttle, infinite boundary

8. A wall camouflaged by trees marks the north edge

9. King street facing the river

group of trees to turn into a brick ramp that spills onto the Prince Street terminus. The western edge is defined by an existing parking lot that from time to time is occupied by vehicles. The backdrop of the western edge is a brick wall formed by a group of buildings, a contrast to the infinite boundary provided by the river.

The site observations came together through the elaboration of a tactile model.(Fig. 33,34) The purpose of the model was to establish an analysis of the surfaces within and around the site. This model became the first intent to unify tactile qualities of previous conceptual experiments and a set program.(Fig. 32a,32b) In order to address the experience of a visually impaired individual, it became clear that the model had to focus on the qualities that were accessible, within hands reach, and experienced through tactility. Therefore the river, rooftops, heights, color, and any structure beyond the perimeter of the site were disregarded. Surfaces such as brick, concrete, and asphalt were described by using different grades of sandpaper to describe their roughness. The gravel path was depicted by utilizing minute pebbles that when touched in the model would mimic the same sounds delivered in the site. Twine represented the soft bouncy grass floor that comprised most of the park's surface. The neighboring building toward the south was excluded since it is contained within a chain link fence. The fence was represented with a fine copper metal mesh that described its grid-like pattern and unstable stance. Together, these materials formed a cohesive diagram of the skin of the site. Various abstract models were executed in order to explore the

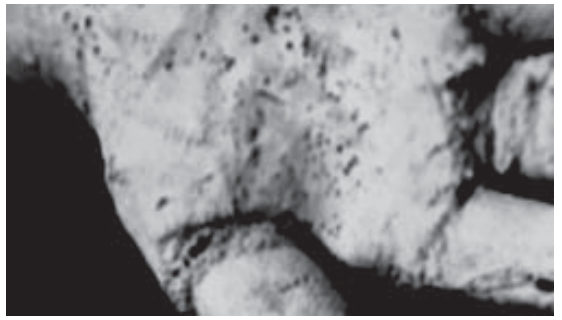


Fig. 32a, 32b These experiments intended to explore materials as skins with potential to evolve as a building material.

Fig. 33

Fig. 34

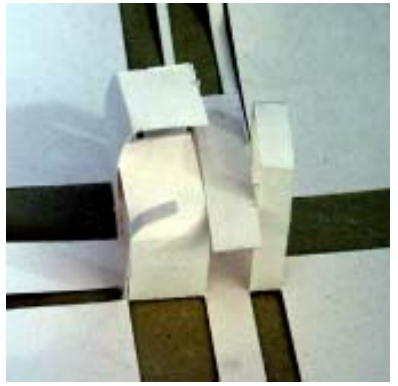


Fig. 35

forming of spaces with “flaps of skin” when “peeling” the site.(Fig. 35) A conceptual model was developed and became the parti of the proposal. The concept describes three major events that resulted from the peeling of the site skin. These events are imperative to the site in relation to the building, its surroundings, and to the Alexandria waterfront.

The first event is a response to the river. To experience the river the skin of the site was pushed in toward the waterfront creating a ramp that slowly descends into the water.(Fig. 36) The ramp is not only an extension of the building premises but becomes part of the parade of activities that occur along the edge of the river in Old Town Alexandria, continuing to offer the site for public use.

The second event comes about when the grassy floor is peeled and held back with a wall, forming a hill toward the west edge.(Fig. 37) The elevated grassy floor now takes on a very strong presence and again is maintained for public use. The presence of the hill provides privacy from the street for the remaining portion of the site facing the river. It also creates drama; no longer horizontal, the grassy floor faces its surroundings as a unique recreational space along the Potomac River. In turn the wall of the hill takes over the role of backdrop, previously provided by the brick buildings on The Strand Street. This pushes the area intended to contain the prosed building closer to the river.

The third event is the creation of an architectural body that unifies site and inhabitant. It occurs on the stage set by the hill and

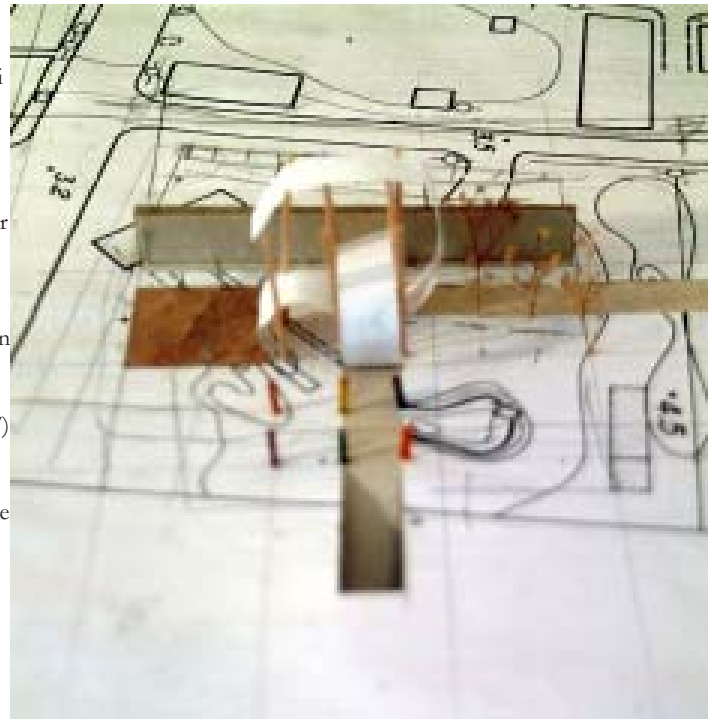


Fig. 36

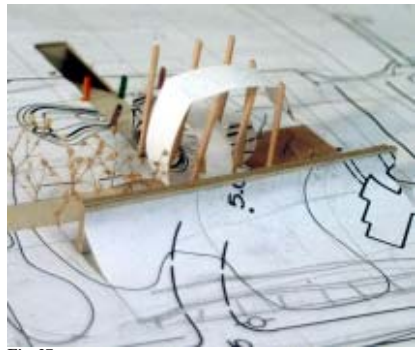


Fig. 37

Fig. 38

the ramp. On this stage dwells a footprint created by a grid of columns. The columns stand at about the same height of the surroundings buildings respecting the scale of its context. Analogous to the body, the columns act as a skeletal frame for the building. As the skin of the site is peeled, the flaps converse with the frame overlapping each other, wrapping certain areas, and forming spaces.(Fig. 38) The result is anthropomorphic: skin supported by a skeleton. In addition, the absence of the peeled flaps gives way for the allocation of gardens along the north and southern edges of the building. The new landscape exaggerates, celebrates, and works in unison with the qualities provided by the existing trees, shrubs, and flowers.

Functional Ellaboration

The program for the thesis proposal begins with the premise that the International Braille Research Center has decided to open a Braille learning facility in Old Town Alexandria. This entity promotes literacy and research studies for better methods in the teaching of Braille. They are mainly concerned with the increase in use of tape recorders and computers with synthetic speech among the visually impaired. Their mission is to encourage and promote the teaching and use of Braille because "listening is not literacy."(8) The center will focus on an after school teaching program that includes individual and group sessions; in addition reading materials will be made available for students as well as nonstudents.

The center will nedd a facility that can accommodate the needs of a selected group of 30 children (between the ages of 5-10), staff, and administrative personnel. The children will be divided between three age groups: 5-6, 7-8, and 9-10. Students will be rotated on a daily basis between individual and group lessons. One child from each age group will be instructed individually. The agenda for the building is as follows:

1. Drop off area- provides direct access to entrance while facilitating circulation to street traffic

2. Reception- receives and supervises who enters and exits building. In addition to the receptionist it will provide enough space for two librarians.

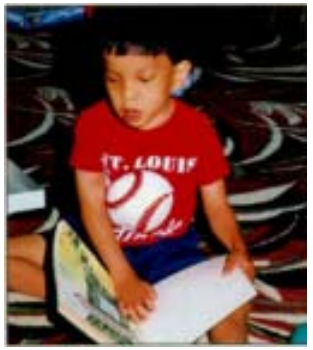


Fig. 39,40,41 Absorbed in their reading these children gain entertainment, literacy and independence through Braille (Photographs courtesy of National Federation of the Blind, Inc)

3. Shelving area- space designated for a collection of donated Braille books; the area will incorporate reading areas for individual study and leisure.

4. Common area- an area for group lessons providing room for three tables that can accommodate 9 students each.

5. Resource room- area designated for one-on-one lessons between student and teacher. The resource room is the most important space of the facility.

6. Office space- six total, three for administration and the remaining to be shared by six teachers.

7. Support staff- two work station areas will be provided to support staff for administration and teachers

8. Lounge- a space designated for staff and administration to socialize and hold casual meetings.

9. Gardens- gathering space for special events, workshops and leisure games

10. Service spaces- these include restrooms, storage, and a mechanical room. Vertical circulation will be both through a staircase and a pitless hydraulic elevator.

The building also includes an area designated for deliveries, pickups and trash removal. Parking spaces for employees and long term visitors are provided by the existing parking lot. The center encompasses the facility and its surroundings. The facility itself will function during daylight hours while the surroundings are open to the public at all times.

Material Ellaboration

Conceptually the proposal is a skeletal frame wrapped with skins. The roles of the skin, the key element in this building, are:

1. To express the singularity of the skeleton, protect it from the elements and depend on it structurally

2. To reveal the function of the space it is enveloping through its texture and materiality

3. To act as a communicating and controlling agent between interior and exterior

The scheme of the project can be divided into 3 skins that respond to their own functional, material, and architectural program:

I. Landscape skins
II. Memory skins
III. Enclosure skins

Each group of skins interact and depend on each other. The progression within the facility, which begins with the approach, is a stage set of tactile experiences that guide the visitor through a sequence of events. The tactile sequence will ultimately provide information to mentally map the building and its surroundings.

Landscape skins:

The function of the landscape skins is essentially to define the settlement for all the other skins. They come about from an interpretation of the site as skin, which is peeled and recessed, creating a landscape between existing and new conditions. Three key elements create a room where the building sits within the site: a hill, a wall and a ramp. The landscape skins are a combination of brick, gravel, concrete, tile, vegetation, earth, grass, and water.

Assuming your approach begins from King Street, your first encounter is the northwest corner of the site. The strong smell of grass emanates from a grassy hill; the grass continues to flow down through the gravel path onto the parking and the street. The grass pavers on the street stand out among the black smooth asphalt pavement. As you step onto the gravel path the grassy hill lures you up, distracting you from the entrance of a path on the northern edge. The hill, a result of peeling back the grass floor, is a gradual ascension of the earth intended to offer a boundary from the street, giving the facility some intimacy. On the hill a group of weeping willows stand scattered among the soft floor. Their branches reach down and caress you with their soft, slender leaves. They create little umbrella-like rooms ideal for napping, meditating, reading, and picnics. As you descend the hill the gravel path leads you back to the northern edge where you find yourself between a low angled concrete wall with mint planting and a dense wall of holly hedges and trees. The gravel path slowly funnels

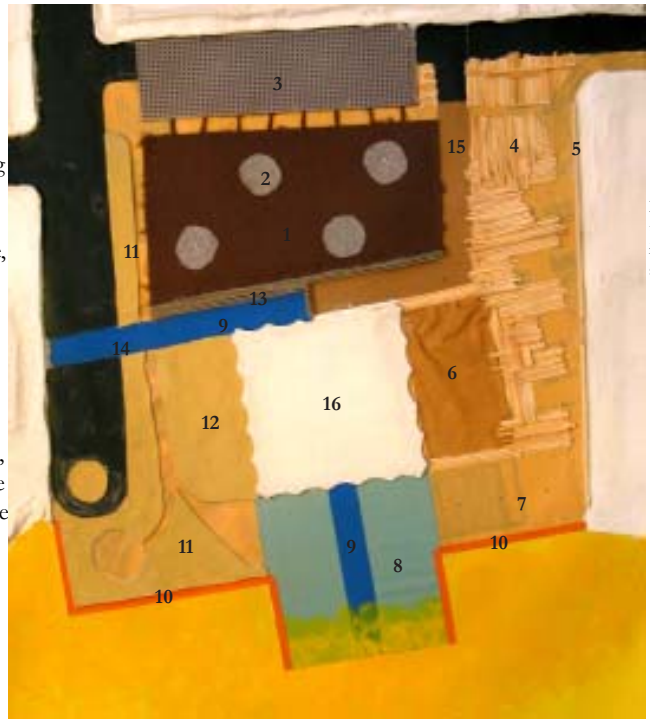


Fig. 42

Fig. 43a, 43b The textures offered by the new vegetation are reflected in the model through the use of various materials. Suede leather and reeds illustrate the relationship between the maple and rosemary foliage on the southern edge, and the holly hedges on the northern edge.

LEGEND:

1. Grass hill
2. Weeping willow
3. Grass pavers
4. Holly hedges and trees
5. Mint wall
6. Moss garden
7. Sculpture space
8. Concrete ramp
9. Ceramic tile
10. Bumpy tile
11. Maple planting
12. Rosemary field
13. Brick wall
14. Drop-off entrance
15. Service area entrance
16. Roof of building

down toward the eastern edge. The stiff and prickly vegetation forms a very defined geometry that staggers along the path, activating your progression into narrow and open spaces. The open spaces are small intimate courtyards, providing benches for those with tired feet. At the same time the hedges protect and embrace a garden "paved" with a moss carpet. The garden is intended only for the visitors and children of the facility; their voices filter through the evergreen leaves as whispers tickling your ears. As you progress down the gravel ramp you realize that the end reveals a small view of the waterfront. The mint planting has slowly ascended to the level of your nose escorting your every step. Smell, gravity and curiosity bring you to the climax of your progression; as the waterfront is revealed entirely. You continue to walk forward tempted to get closer to the water, but the edge is paved in bumpy orange tile that cautions you to stay away. As you continue to wander east you meander along the open space and encounter three steel columns. The columns hold up wind sculptures intended to be temporary installations, inviting artists of the community to continuously change them. The gravel floor is suddenly silent and stable and you realize that the surface beneath you is a smooth skin of concrete stained a light blue. The floor suddenly slopes dramatically toward the water into a ramp. The ramp, a result of recessing the waterfront, slides into the river providing physical contact with the water while becoming part of the parade of recreational spaces that coexist along the Potomac River. In addition to the smooth concrete, the center of the ramp is paved with dark blue ceramic tiles. The tiles

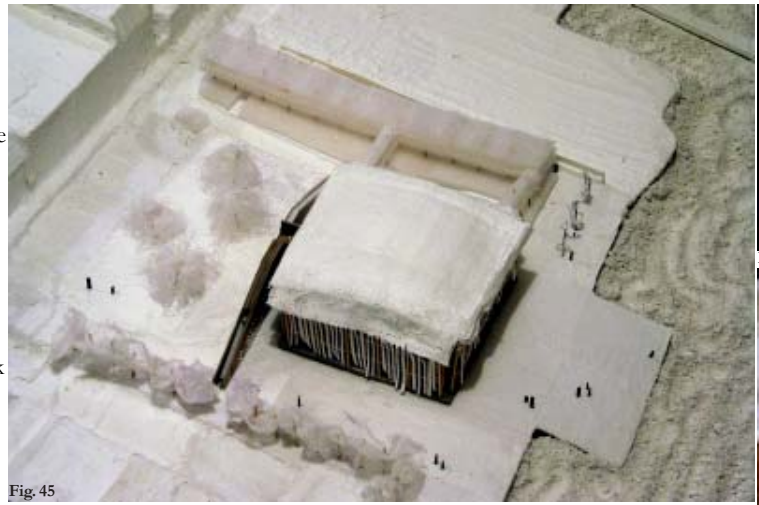


Fig. 45


Fig. 44


Fig. 49


Fig. 46


Fig. 47


Fig. 48

enhance the axis between ramp and a secondary building entrance. As you continue to encircle the site leaving the concrete skin behind, the gravel path reappears and leads you through a delicate curve flanked by a parade of maple trees on one side and a field of rosemary stalks on the other. The deciduous nature of this vegetation offers shadows and refreshes the breeze during summer and eventually sheds during winter giving way to maximum sun exposure. Distracted by the scented air you suddenly realize that the rhythm of your steps has become silent again. You stand once more on the blue tile which has made its way through the building and onto Prince Street. It is here that the landscape offers a formal entrance into the facility. The maple trees have opened into a portal connecting the tile strip to a drop-off area. As you walk along the strip you find yourself immersed in the scent of rosemary again. Now a new scent is present, the smell of the earth. A brick wall parallel to the tile floor plays a dual role in this scheme; like a bandage it stops and holds back the peeled earth that forms the hill; then it pierces through the enclosure skins of the building guiding the visitor directly to its center, the memory skins.

Memory skins:

Guided by a handrail on by the brick wall that is smooth on top and articulated on the sides, your hands create a rhythm as you slowly approach the entrance. As you enter and cross the threshold between landscape and enclosure skins, an automatic door greets you, releasing conditioned air as it opens. The change in temperature gives you goosebumps while your lungs adjust to the new air, missing the aroma of rosemary. The handrail escorts you to the center of the facility as the wall turns and penetrates the enclosure of the building. At the center of the space you come into contact with the resource room. The resource room is the term used to denote the space in which individual attention is given to a child during a teaching session. One resource room will be provide for each of the three age groups. The rooms are stacked and contained within a single cylinder at the center of the space. Due to its hierarchal significance, the cylinder is positioned to serve as a landmark within the building. Visually impaired individuals center themselves when traveling in a space. As a landmark, the cylinder acts as the center of origin for the building's circulation. The floor surrounding the cylinder, and elements on it face, act as directional coordinates.(Fig. 50) The west side is defined by the presence of the brick wall, leading back to the building's entry. A floor of blue tile on the east marks the path to the river and the location of a staircase. The cylinder opens on its north side, forming an entry into the resource room.

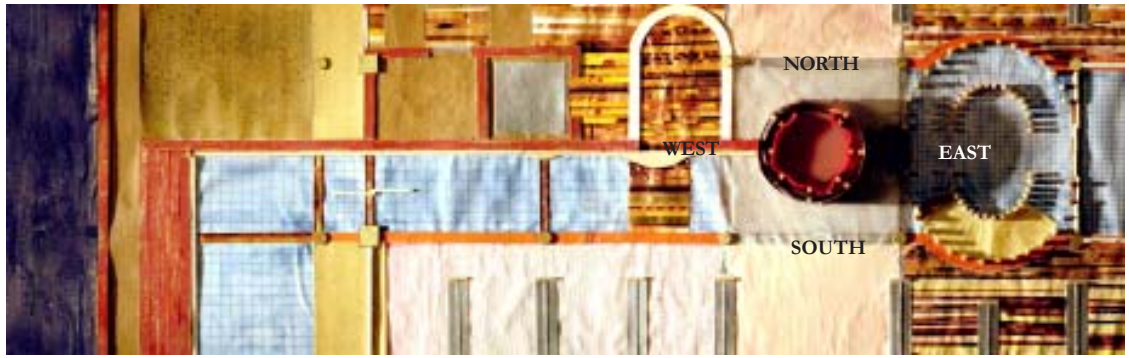


Fig. 50


Fig. 51 Weathered copper scales at Resource Room


Fig. 52 Behind the velvet curtain a teachers material are stored on shelves that inhabit the voids in the structure of the cylinder.

The cylinder's function is analogous to a brain, the organ that basically functions as a warehouse, storing memory, triggering emotions, gives us the faculty to learn and feel, and controls voluntary movement. This "brain" materializes with a layering of skins, which in one way or another record contact. The outermost layer is made of copper plates: scales that chemically react to the touch of human skin.(Fig. 51) As the copper skin of the cylinder records its contact with the building's inhabitants, it serves as a visual manifestation of visually impaired people's need for tactile interaction. The next layer is a metal cloth sprayed with liquid latex, creating a thick, translucent skin that provides an acoustical barrier and yields to touch. The interior is softer, padded with a curtain of crushed velvet which wraps the space, acting as a door. Its floor is made of memory foam, which conforms to the profile of each individual's body. Memory foam is made of Pudgee, "a high-density foam…With properties of both foam and a gel, Pudgee has some give as well as a memory; it responds to weight by receiving the impression of the body placed upon it...Soft and pliant, Pudgee also eases the sitters circulation, allowing more comfortable sitting for long periods of time."(9) A circle of seven pairs of steel columns, joined by tension rings at each floor level, forms the skeleton of the cylinder. Voids within this skeletal frame, hidden behind the velvet curtain, contain shelves for storing teaching materials.(Fig. 52)

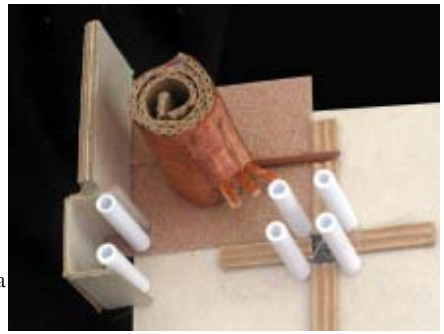


Fig. 53 Preliminary model proposing a copper volume

Fig. 54a, 54b Study model of cylinder exploring material and strcuture

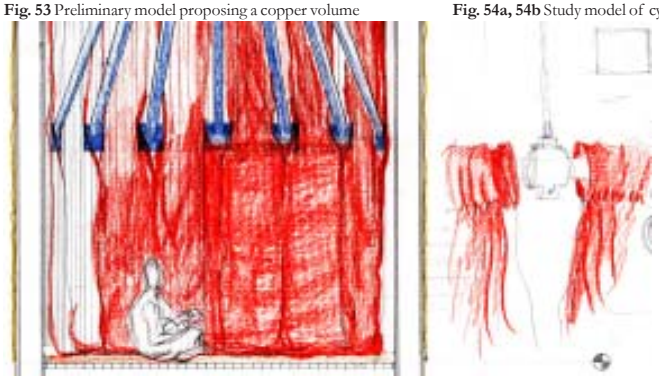


Fig. 55 Preliminary sketch of resource room interior and curtain detail

Fig. 56 Memory foam cushion reacting to touch

Enclosure skins:

The enclosure skins define the body of the building within the landscape skins, embrace and protect the memory skins, filter the exterior elements, and create pockets of interior space. The enclosure skins are a result of a direct analogy to the four basic layers of human skin: epidermis, dermis, hypodermis, and deep fascia(Fig. 57). Each of these layers have an interdependent relationship with the skeletal frame of the building. The skeleton is made of glue laminated wood, arranged in a column and beam grid. The epidermis of the enclosure skin is composed of multiple cell-like PVC panels. These prefabricated panels are placed on the east, west, and south sides of the building to protect against exposure to direct sunlight. The panels are woven together with a slit in each corner, secured by a simple bolt, which is supported by the dermis.(Fig. 58a) The dermis is made of steel cables that connect the panels to a row of angled columns, which are in turn braced back to the primary structure of the building with diagonal tension members.The hypodermis seals the building, providing a watertight insulating layer. It is composed of hollow glass tubes, stacked horizontally in each column bay. The hollow cylinders store pockets of air, providing lightweight and effective insulation. Light is distorted as it passes through the tubes, cutting off views, while maintaining a strong connection with the passage of the day. Students will be able to judge the conditions outside the building by touching the glass tubes and feeling their temperature. Sealed within the

Fig. 57 Portion of a section showing the layers of the enclosure skins

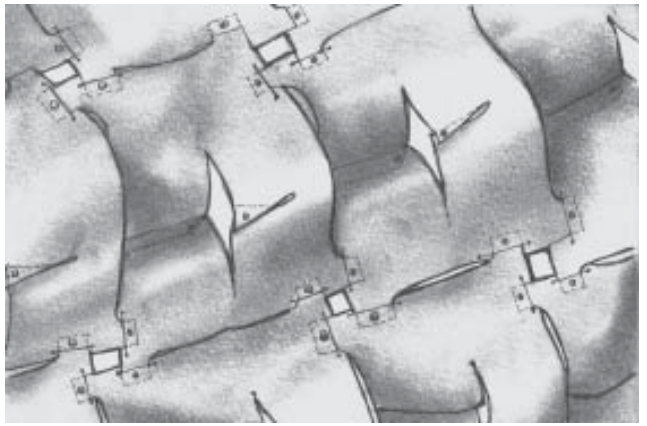


Fig. 58a Detail of PVC panel connection

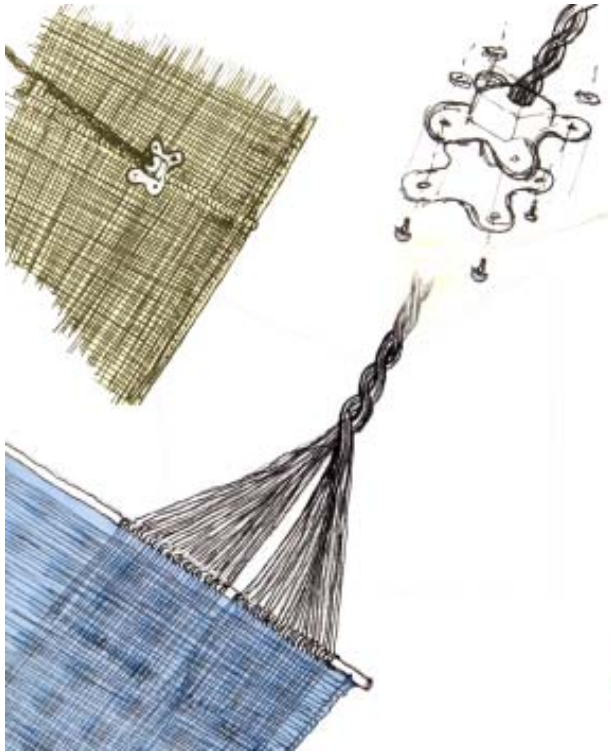
Fig. 58a Detail of East elevation collage showing texture of PVC panels

hypodermis, the deep fascia manifests itself as flaps of skin that form pockets of space. These flaps create continuous surfaces, uniting floor, wall, and ceiling into one fluid gesture that sets the stage for the activities of the building. Each flap has a texture and color that respond to the activities that take place within the space it contains, providing a code for building occupants. The texture is achieved by casting rubber, reinforced with a PVC coated, fiberglass screen mesh. The mesh is then attached strategically to the main structure.

Similar to the skins, the structure also is analogous to the human skeleton. The dimension and shape of its main elements, column and beam, is directly affected by the role they perform. The column-beam combination creates a grid that compartmentalizes the interior realm of the building into 5 equally spaced bays in both directions. The square footprint is divided into a total of 25 quadrants. The quadrants are accentuated by the presence of a column on each of its corners and also by a metal joint on the floor that traces the realm of the quadrant. Inhabitants are encouraged to leave their shoes upon entry into the building so that the tactile experience becomes more acute.

A roof membrane and a monolithic concrete base provide the horizontal skins that complete the enclosure skins, hovering and protecting the interior spaces, and establishing the realm of the structure between sky and earth. All the columns emerge from the monolithic concrete base. The base is thicker at the rims where the weight and pull of various elements have come to rest. The base grants stability for the building as it sits on earth with a high water table due

Fig. 59a,59b Glass tubes that inhabit the exterior columns distort light and views; the inhabitants are observed as shadows and silhouettes as depicted in the image above.



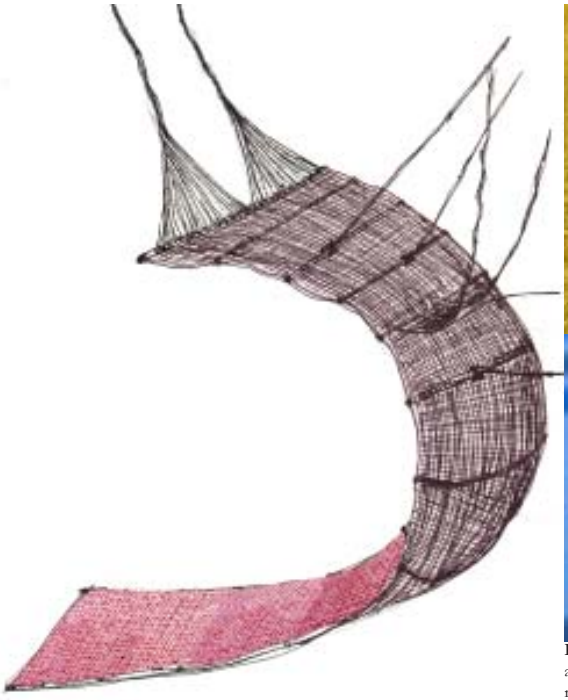


Fig. 60 Hand drawings showing details of the rubber skins

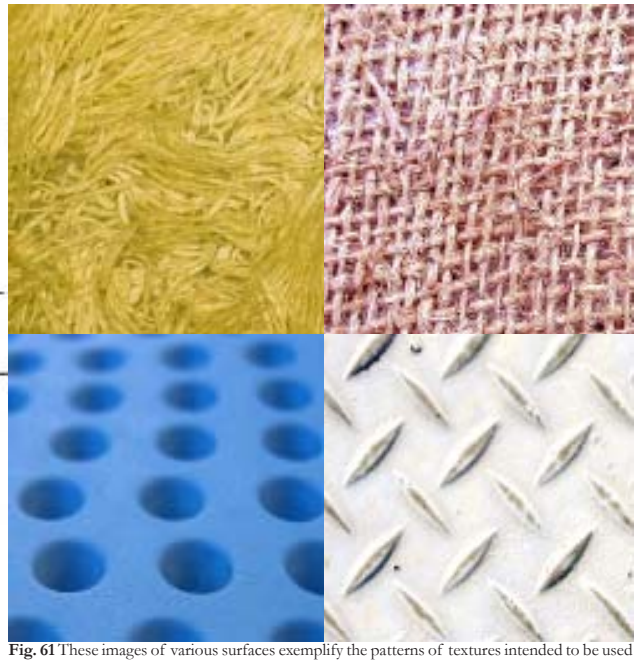


Fig. 61 These images of various surfaces exemplify the patterns of textures intended to be used as molds for the rubber skins. The inhabitant has the option of leaving their shoes at the reception desk upon entrance into the building. Hands and feet together are exposed to help the inhabitant mentally map his/her location. The images were modified in order to match the hue of the colors used in the design.

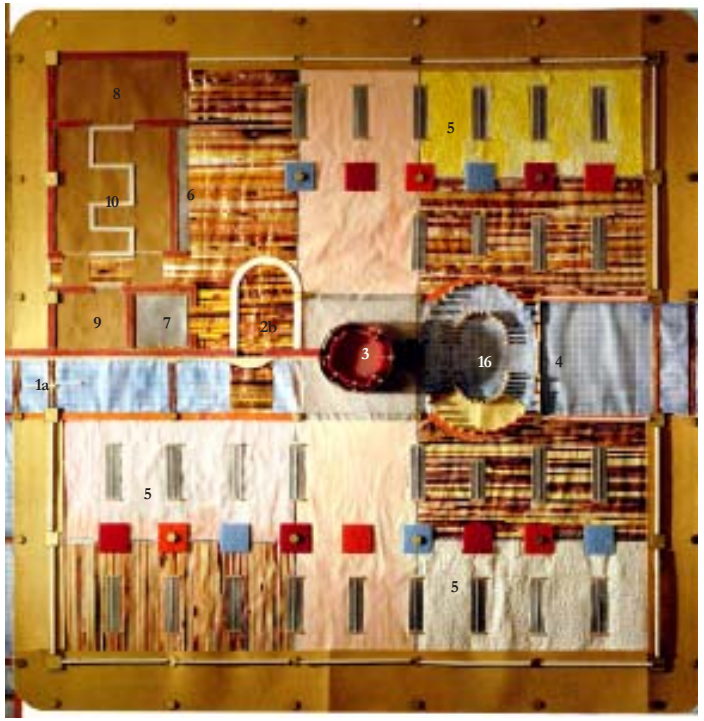


Fig. 65a First Floor plan

LEGEND:

1a. Main entrance 1b. Exit to wall 1c. Exit to hill 2a. Reception/librarian 2b., 2c. Support staff 3. Resource room 4. Exit to ramp 5. Shelving area 6. Common basin 7. Elevator 8. Storage 9. Mechanical Room 10. Restrooms 11. Group session area 12. Teacher office area 13. Administration 14. Lounge 15. Service area entrance 16. Staircase

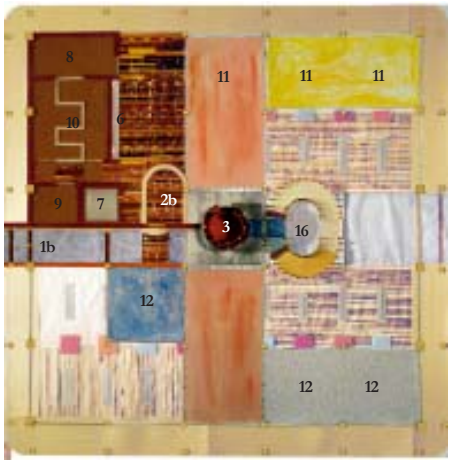


Fig. 65b Second Floor plan

Fig. 65c Third Floor plan

to the nearness of the river. In the first level the base of the columns are at their widest. Much like human bone, the density and size of the columns go hand in hand with the structural demands. The structure has three types of columns: the peripheral columns, the boundary columns, and the interior columns. The boundary columns define the footprint of the protected interior space and house the glass tubes. The western and eastern boundary columns are very large as they receive the weight of the lenticular trusses that extend the total length of the building. The boundary columns on the north and south extend and reach the truss coming into contact with the bottom cord. The face of the truss is then shielded by operable louvered panels. The periphery columns support the PVC panels and are slightly angled at their base. The angle provides tension between rings that are wrapped around the top of the column and tension rods integrated into the roof membrane. The pulling and the natural curve of the trusses keep the roof taut and firm, facilitating the evacuation of water, snow and debris. The roof membrane is made of a layer of batt insulation sandwiched between two layers of heavy duty PVC fabric. The membrane is placed over metal decking that rests on the trusses extending between each bay. Below a sub-roof made of operable louvres, controls the flow of air out of the building, trapping heat during winter and ventilating air during the summer. This sub-roof is supported by the interior columns. The interior columns are free from major structural demands and concentrate on supporting mainly the inhabitants, equipment and the various flaps and flooring at each level of the building.

Fig. 62 stacks of felt, create a series of column "rooms" ideal for reading and studying. They are located in the first level among the shelving area. The geometry of each of these "rooms" are different; they work as landmarks to help the visually impaired inhabitant distinguish each section of shelving.

Fig. 63a,63b Relationship of roof truss and columns at north-south and east-west section

Fig. 64 Concrete base thick at rim; interior column is woven to base

Bibliography

1. Anatomy for the artist; Sarah Simblet; Doring Kindersley Limited; 2001
2. Touching: the human significance of the skin; Ashley Montagu; Harper & Row Publishers; 1986
3. Skin: The human fabric; Doug M. Podolsky; U.S. News Books; 1982;
4. Skin; Ellen Lupton; Princeton Architectural Press; 2002; pg. 106
5. Images of the Body; Philippe Comar; Harry N. Abrams, Inc.; 1999;
6. National Geographic: "Unmasking Skin"; Vol. 2, No. 5; Joel L. Swerdlow; National Geographic Society; 2002
7. A+U: "An architecture of the seven senses"; Juhani Pallasmaa; A+U Publishings; 1994
8. Body and Building: Essays on the Changing Relation of Body and Architecture; George Dodds (ed.), MIT Press; 2001
9. Christo & Jeanne Claude in the Vogel Collection: "The fabric of art"; Molly Donovan; Harry N. Abrams, Inc.; 2002
10. RES: " The body and architecture in the drawings of Carlo Scarpa"; Marco Frascari; No. 14; Autumn 1987
11. Immaterial Ultramaterial: architecture, design, and materials; Toshiko Mori (ed.); George Braziller/Harvard Design School; 2002
12. Structure and surface: Contemporary japanese textiles; Cara McCarty and Matilda McQuaid; The Museum of Modern Art; 1998
13. Package design in Japan; Benedikt Taschen; Rikuyo-sha Publishing; 1993
14. Carlo Scarpa; Benedikt Taschen; Archivio Carlo Scarpa; 1994

Works Cited

1. Skin: The human fabric; Doug M. Podolsky; U.S. News Books; 1982; pg. 39
2. Skin; Ellen Lupton; Princeton Architectural Press; 2002; pg. 106
3. Images of the Body; Philippe Comar; Harry N. Abrams, Inc.; 1999; pgs. 69-70
4. Body and Building: Essays on the Changing Relation of Body and Architecture; Marco Frascari, George Dodds (ed.), MIT Press; 2001; pg. 263
5. Christo & Jeanne Claude in the Vogel Collection: "The fabric of art"; Molly Donovan; Harry N. Abrams, Inc.; 2002; pg.24
6. RES: " The body and architecture in the drawings of Carlo Scarpa"; No. 14; Marco Frascari; pg. 125
7. RES: " The body and architecture in the drawings of Carlo Scarpa"; No. 14; Marco Frascari; pg. 139
8. http://www.braille.org/
9. Skin; Ellen Lupton; Princeton Architectural Press; 2002; pg. 236

Images Cited

Fig. 1- Times Square- http://www.morguefile.com
Fig. 2a- Children using computers- http://www.morguefile.com
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Fig. 3- Woman smelling flower- http://www.morguefile.com
Fig. 4- Painting- http://www.morguefile.com
Fig. 5- Playing guitar- http://www.morguefile.com
Fig. 6- Epidermis- http://www.nlm.nih.gov
Fig. 7- Dermis- http://www.nlm.nih.gov
Fig. 8- Hypodermis- http://www.nlm.nih.gov
Fig. 9- Deep fascia- http://www.nlm.nih.gov
Fig. 10a- Apligraf- Skin; Ellen Lupton; Princeton Architectural Press; 2002; pg. 49
Fig. 10b- Silicone mask- http://www.thomasfoldberg.dk/stunt-mask.html
Fig. 11- Soles of feet- http://www.morguefile.com
Fig. 12- Eyelid- http://www.morguefile.com
Fig. 13- Elbow- http://www.morguefile.com
Fig. 14- Fingerprints- http://www.morguefile.com
Fig. 15- Figure holding his skin- http://www.nlm.nih.gov
Fig. 16- Skin clothing- Skin; Ellen Lupton; Princeton Architectural Press; 2002; pg. 107
Fig. 17- Nuba scar patterns- http://www.afrikaplanet.com/page.php?pagina=home&sezione=index
Fig. 18- Nuba scar patterns- http://www.afrikaplanet.com/page.php?pagina=home&sezione=index
Fig. 19- Nuba scar patterns- http://www.afrikaplanet.com/page.php?pagina=home&sezione=index
Fig. 20a- Anatomized doll- Skin; Ellen Lupton; Princeton Architectural Press; 2002; pg. 2
Fig. 20b- Anatomized face- Images of the Body; Philippe Comar; Harry N. Abrams, Inc.; 1999; pgs. 80

Fig. 21- Anatomized woman- Images of the Body; Philippe Comar; Harry N. Abrams, Inc.; 1999; pgs. 81
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Fig. 23- Touching baby- http://www.morguefile.com
Fig. 26a- Braille- http://www.imageafter.com
Fig. 26b-Teaching braille- http://www.perkins.org/gallery_lrg.php?id=62&pid=41
Fig. 28a- Blind man walking- http://www.vesid.nysed.gov/specialed/nyssb/resource.htm
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