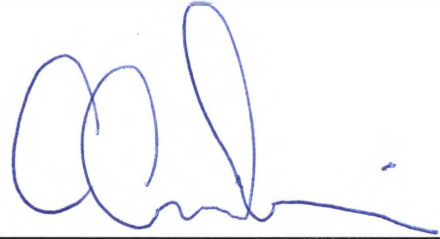


To the Graduate Council:

I am submitting herewith a thesis written by Sandra L. Restrepo-Tovar entitled "Understanding Space through the Experience of Dance." I have examined the final paper copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Architecture, with a major in Architecture.

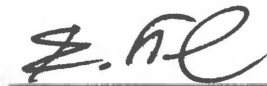


Charles A. Debelius, Major Professor

We have read this thesis and
recommend its acceptance:



Barbara Klinkhammer



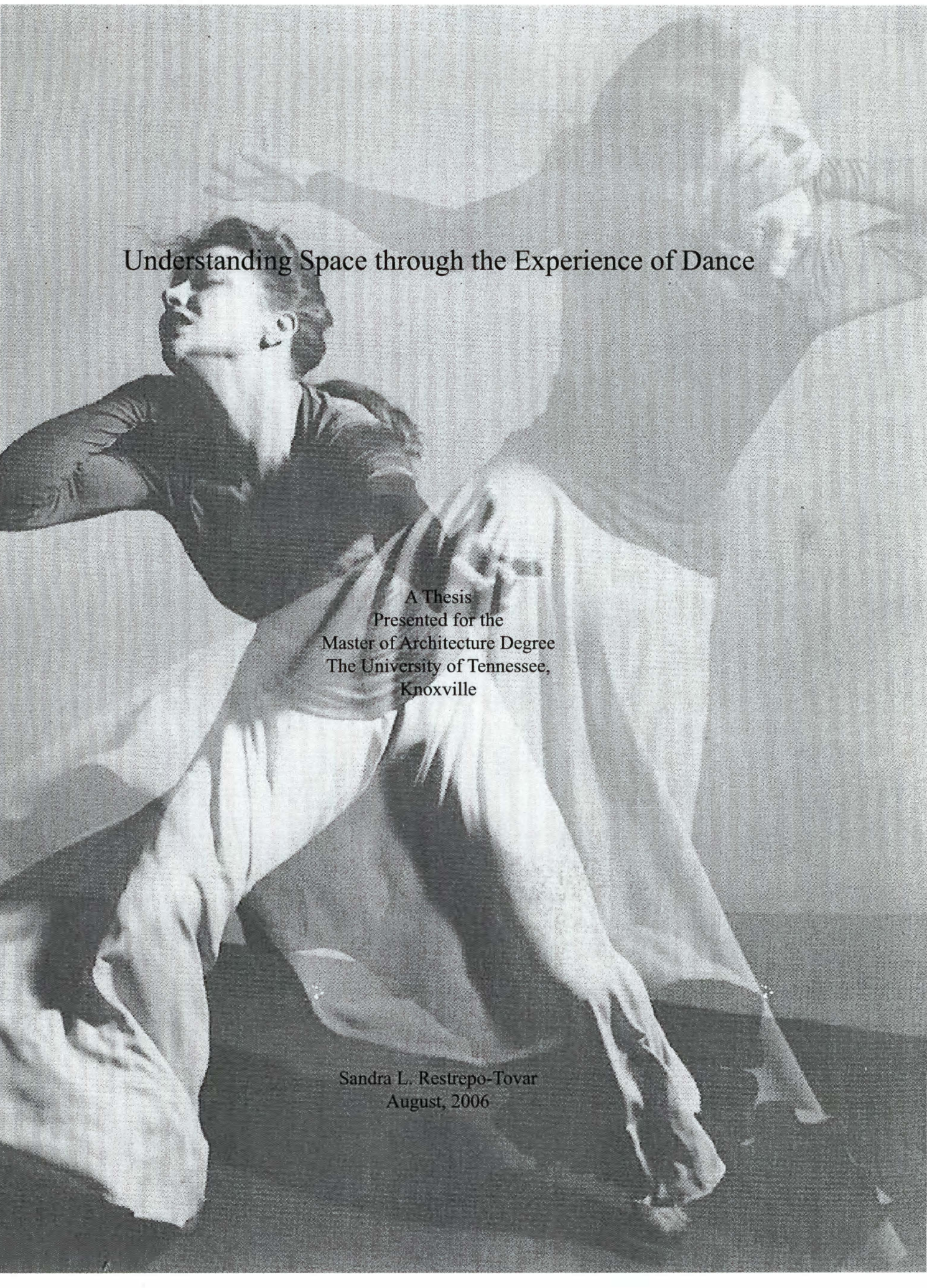
Edgar Stach

Accepted for the Council:



Vice Chancellor and
Dean of Graduate Studies

Thesis
2006
.R44



Understanding Space through the Experience of Dance

A Thesis
Presented for the
Master of Architecture Degree
The University of Tennessee,
Knoxville

Sandra L. Restrepo-Tovar
August, 2006

Dedication

I would like to dedicate this achievement to my family who has always supported and envouraged me. Mama, Papa, Oscar, Jaime, Perla, Blanca, I thank you and I and I know that you are always with me.

THESIS STATEMENT

“Space, said choreographer George Balanchine, ‘is everything’. A symphony can be enjoyed live or on record, a play can be seen or read, but dance emerges through the single medium of space. Without space, dance does not exist.”

“There are ceremonies that determine space, and spaces that determine ceremonies.”

Bernard Tschumi

Architecture can be experienced in various forms. Though we often consider sight the primary means through which architectural space can be understood, one would also argue it is more relevant to examine how the whole body responds and “sees” space. Movement is an important vehicle for the understanding of space, and it should be an important part of the intention of the architect. In dance, as in theater or any performing arts, there is a fluid exchange and interconnectivity with the surrounding environment that can create the setting for performance to take place. It is through space and movement that dance exists.

The intention of this thesis proposition is to investigate how movement activates space, through the study of contemporary dance, proposing a method of understanding architecture that is based on the ideas and language of dance. The goal is to investigate how the study of contemporary dance can help inform the creation of architectural space. It is the intent of this investigation that through the study of movement via contemporary dance, an architectural application that emphasizes movement can be developed.

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I: SETTING THE GROUND

The main premises that set the ground for contemporary dance deal with the awareness and experience of body, place and time. This awareness is possible through consciousness of movement and weight, it seems that these premises are closely related to the better understanding of space. In the everyday experience of architectural or urban space movement is almost an unconscious act. What seems relevant about the study of contemporary dance is the process through which these issues become conscious actions.

It is important for the purposes of this investigation to consider the efforts developed by some contemporary dance choreographers to try to liberate the study of dance from music and the story line of poetry as in classical ballet, and rather understand it as pure movement. According to this, dance can be studied as an independent form of art, which is based on the language of movement. Dance depends on movement and on space and is a reaction to space, as choreographer and theoretician Rudolph Laban stated: “dance as an independent art form based on harmonious correspondences between the dynamics of movement and spatial pathways”.

Another interesting position of some contemporary dance choreographers is their

2 *Understanding Space Through the Experience of Dance*

attempt to relate the layman to dance and not only the trained public. In contemporary dance there is an interest in making a connection from dance to everyday experiences of people's life. An example of this is the work done by Pina Bausch: "Her work evokes a 'theater experience' that involves all of the senses of the onlooker, a change in dance from an aesthetically abstract form to one of an everyday physical experience in style and content". An important aspect to which architecture should respond is how to create spatial environments that engage the individual in the entirety of his or her senses. This can be achieved through creating conditions that direct or guide movement through spaces according to the relationships and connections that these have, as a way for the individual to understand space.

The question that arises from this is how architecture is created to set the body in motion and direct it, as dance sets the body in motion, as well as how motion is a vehicle to awaken the conscious experience of exploring space. The intention of the investigation is to understand how the language of movement in dance can be the basis for architectural creation. An analogy between architecture and dance would then be created, where the routine or trajectory of a dancer would be translated into architecture. The design of the building would then be thought in

terms of movement, and as in the choreography of a specific routine, the choreography (design) of a building would be thought in terms of the different “movements” or spaces in that building.

This, based on the understanding that choreography, which is also known as dance composition, is the art of making structures in which movement occurs. The term composition can also refer to the navigation or connection of these movement structures. A metaphor of how the trajectory of a dancer activates the space that he goes through could be established to elucidate how the dynamics of movement gain sense in architectural production, and how dance could inform an architecture that emphasizes movement.

The development of the investigation will touch on understanding what the components of choreography are, to then introduce a description of the different elements that make these components possible, that is, the elements that are inherent to dance. A parallel with different architectural equivalents to these elements will be established, as a way of understanding how the correlation between dance and architecture can be made.

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II: TOWARDS A CORRELATION BETWEEN MOVEMENT AND ARCHITECTURE

Dance can be referred to as the Art of movement. A distinction must be made between dance movement and mechanical movement. Dance movement consists of directed, structured, layed-out movement. In other words dance movement is choreographed while mechanical movement is spontaneous and improvised. Through the practice of dance there is a conscious understanding of space developed in order to move through it, dance stresses the awareness of being in space. An excerpt from an interview with University of Tennessee's Dance Department choreographer Angela Hill, demonstrates how important the awareness of being in space is as the first step before learning the specific techniques that pertain to a choreography: "I encourage them [the students] to walk through the entire space, noticing the empty spaces and the other people in the space" (fig. 1-2).

From the perspective of Rudolph Laban movement is what originates the perception of space, which determines how a dancer is someone that is aware of the world that surrounds him or her: "We see that the lived body not only inhabits space and time but also synthesizes them in movement (Merleau-Ponty) and that space-time-energy are constantly renewed through the

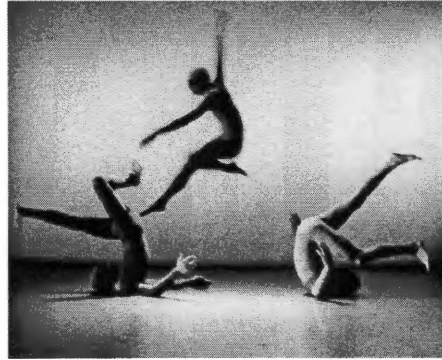


Fig. 1. Contemporary Dance



Fig. 2. Laban Dance Company

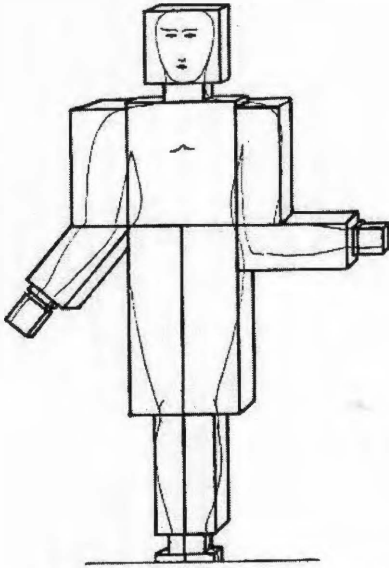


Fig.3. From the Triadic Ballet: The laws of the Surrounding Cubical Space: Ambulant Architecture

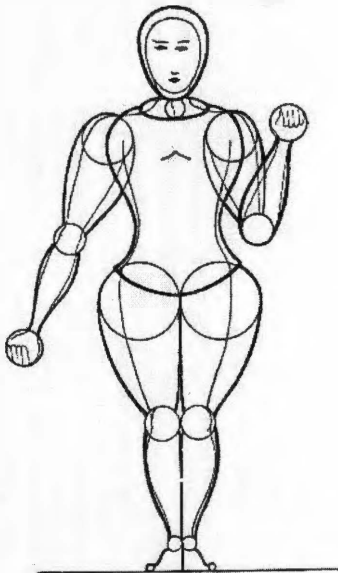


Fig.4. From the Triadic Ballet: The Functional laws of the Human Body in their Relationship to Space: The Marionette

power of gesture (Laban)” (Maletic, 1987).

One example of how movement is relevant to the understanding of space is an area recently developed in contemporary dance, Site-Specific Dance, which involves becoming intimate with the landscape or building through a series of movement dynamics. The idea is that through movement the person develops an understanding of the constraints that the space imposes. In this case the space might not be purposefully “choreographed” to direct movement.

Another interesting example, which relates closer to how the designer is the choreographer is Oskar Schlemmer’s Triadic Ballet. His work is an interpretation of the human body moving through space. The different costumes proposed are a metaphor of different relationships of body and space. They are conceived as an evidence of how architecture can constraint actions, the Triadic Ballet explores how the body and its freedom of movement transforms through costumes, as an abstraction of how space influences movement. (fig. 3-6)

This investigation is developed from the point of view of the architect that is able to create different conditions as choreographer through understanding space, as the choreographer understands movement to create a composition.

The relationship or connection that is being made in this investigation between dance and

6 Understanding Space Through the Experience of Dance

architecture is about the articulation, relationships and organization of spaces, rather than an attempt to adopt an aesthetic approach by capturing a specific movement in dance and transforming it into spatial form. Is important to bring into architectural discussion the understanding and study of movement because of the similarities and parallels that are possible to establish between the way dance is created and how architecture can be created. The elements and ideas that create modern space can be compared to the elements that create dance. In architecture the transformation of a simple first organization (which is the parti) is the starting point to create a more complex and articulated design.

It is important to understand and discern first the principles of composition.

PRINCIPLES OF COMPOSITION IN DANCE.

In choreography, the intent is achieved through the principles of composition, just as in architecture composition is a medium through which the design takes form. In order to have a better understanding of these principles it is appropriate then to enumerate them:

Climax: The structure of a choreography has a beginning, a middle and an end. The climax is the highlight or turning point of that process, where the intensity of energy and speed changes

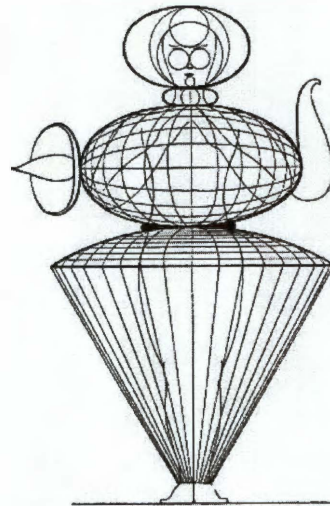


Fig. 5. From the Triadic Ballet: The Laws of Motion Human Body in Space: A Technical Organism

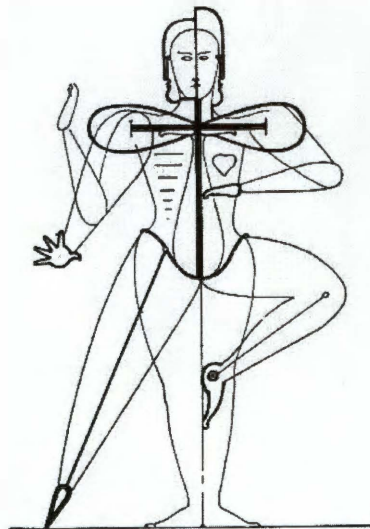


Fig. 6. From the Triadic Ballet: The Metaphysical Forms of Expression: Dematerialization

and usually increases.

Repetition: It is a way for the audience to see the movements in more detail as well as a way for them to become more familiar with the vocabulary. It also helps to give emphasis to certain movements, and when used in different sections of a dance it helps create unity by relating sections to each other. It is used to create tension as well.

Sequencing and development: It refers to the ordering of movement (sequencing) in a meaningful way (development). The intention is that each choreographic idea should be originated and grow in a logic fashion out of the previous one, in order to create continuity. When movements are purposefully connected to each other they gain meaning.

Transition: It is a way of connecting movements and dance phrases in a meaningful way, it contributes to the continuity of the sequencing.

Variety: Unlike movements create variety. It is utilized when movements are repeated by varying spatial, dynamic, body or relationship aspects when movements are repeated.

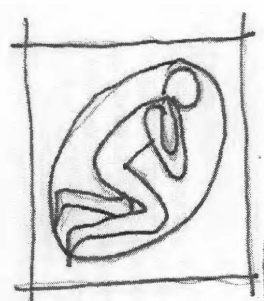
Aspects like sequentiality and simultaneity are considered important in the process of choreography, as a correlation between movement and time. Sequentiality and simultaneity have to do with the order of movement within the choreography. They establish the relation-

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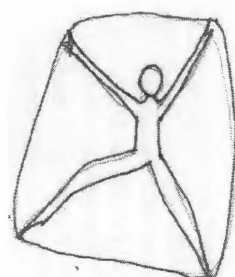
ships between various movements. These relationships can be from one movement to the next (as in sequentiality), or between two different actions that distinct parts of the body are doing, as well as the actions that two or more dancers are performing at the same time (as in simultaneity). Laban asserts that “The choreographer can select and organize the order of directions and design the performance either sequentially, creating various shapes, or simultaneously, creating several sequences or chords of spatial tensions at the same time” (Maletic, 1987). This could be a good start at understanding how aspects inherent to dance apply to an architectural space, where a building is designed depending on the desired relationships and connections between spaces. It is asserted to infer that the same way dance activates space, movement in a building activates space.

ELEMENTS OF MOVEMENT IN DANCE

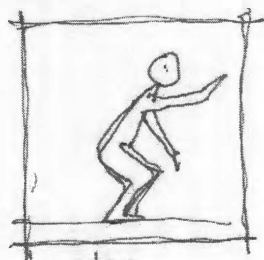
Understanding the language of movement is the basis of the work of choreographer and theoretician Rudolph Laban, who devoted his efforts to describing, classifying and notating movement. The method he developed, Labanotation, uses symbols to define direction of movement, part of body doing the movement, level of movement, length of time used to do the move-



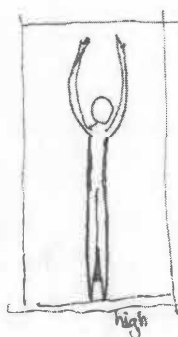
Small



extended



low



high

Fig. 7. Diagrams of the Kinesphere

ment.

Thinking in terms of movement and dance, it is appropriate to look into some of the components or mechanisms through which the principles of choreography take form, namely: Space, Time, Weight, and Flow.

Space: according to Laban, it can be defined in two ways. **Action space** is defined as the invisible space described with the body, the space reached with the extremities and movement of the body, in Laban's terms the kinesphere. The Kinesphere can change size, grow, and shrink depending on the extension and bending of the joints (fig. 7). Action space reveals psychological and emotional components. **Geometric space** is defined as the physical visible space, or what we understand as architectural space.

There are different aspects that help determine space, like **direction**, **levels**, **pathways**, (all of these are part of locomotor movement) **shape and size** (these two are part of nonlocomotor movement).

•**Direction:** forward, backward, sideways (left and right), upward, downward. Direction is judged in relation to the center of the body. The combination of the four basic directions determines the orientation and creates more complex patterns which are related to states of equilibrium, namely stable (dimensionals) and mobile or labile (diagonals). From the significance of direc-

tions in dance we can see a similarity with symmetry and balance in architecture (fig. 8-11).

- Levels: high, middle, low/deep. In architecture this could refer to scale, and the way spaces can shrink and grow to create intimate or large scale spaces (fig. 12).

- Pathways: patterns or designs made in the air or on the floor by the person's movements: pathways appear as straight lines, curved lines, or combinations of straight and curved. A parallel can be established between pathways and circulation in architecture (fig. 13).

- Shape: the form or design of the body's position. This would be translated as the geometry of spaces (fig. 14).

- Size: the magnitude of the body's shape or movement, size is a continuum of small to large. Size can be interpreted as hierarchy of spaces (fig. 15).

Time: it is introduced, both in architecture and in dance, as moments, intervals, sequences. Movement has a temporal character. The dynamics related to time refer primarily to how the body moves. These dynamics include:

- Duration: length of time needed to do a movement: time units of varying choices which can change from sequence to sequence.

- Even and Uneven rhythm.

In dance and architecture there can be a change in rhythms, while maintaining unity and repeti-

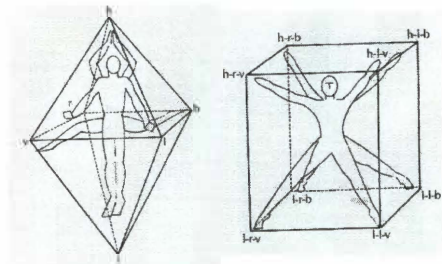


Fig.8. Directions: the octahedron-dimensionals, the cube-diagonals

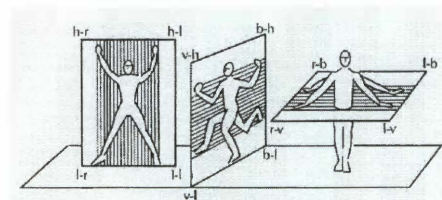


Fig.9. Directions: three dimensional planes: vertical, sagittal and horizontal

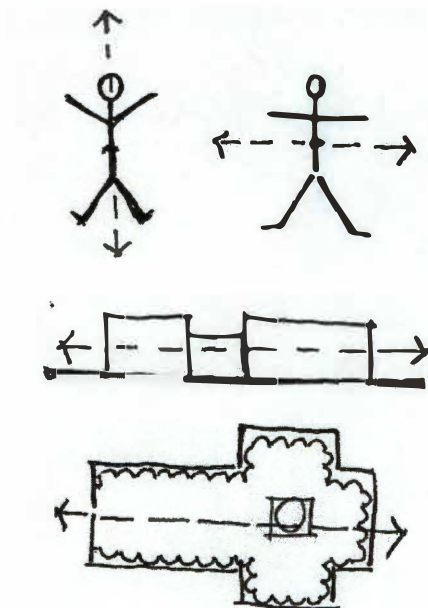


Fig.10. Dimensional directions and their equivalent in horizontal balance. Diagrammatic section and plan

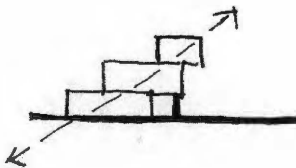
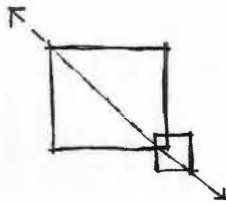
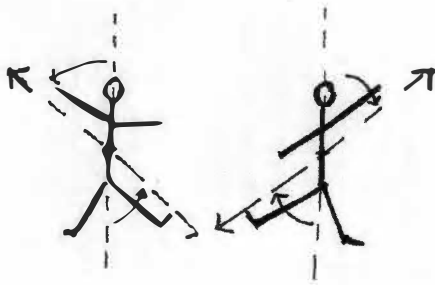


Fig.11 Diagonal directions and their equivalent in unstable configurations in plan and section

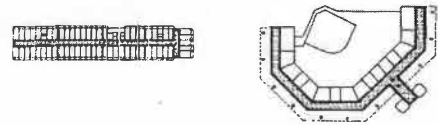


Fig.13. Pathways and circulation

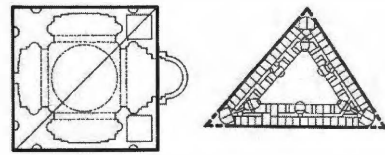


Fig.14. Shape and geometry

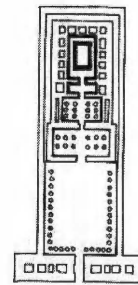


Fig.15. Size and Hierarchy

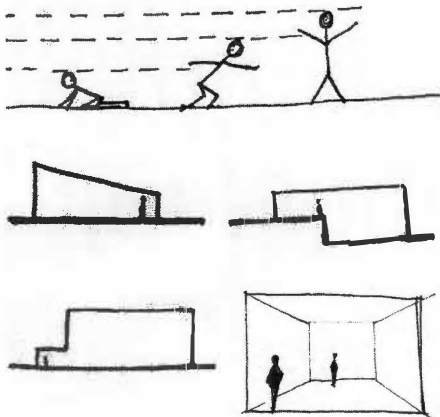


Fig.12 Diagrams of level and scale

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tion (fig. 16-17).

•**Speed:** it defines the time signature. It can be fast, medium or slow, accelerated or delayed.

Flow and weight: they configure different relationships. **Flow** works simultaneously with time since it has to do with retardation and acceleration of movement. The former two help create transitional passages within the flow, that lead to a new movement, contribute to the dynamics of movement through space as well as of the experience, and contribute to the continuity of the flow through connecting separate movements. Retardation encourages forward movement: "Suspense derives from the temporary suspension of action" (Arnheim, p.158). Transitional passages act like secondary spaces in architecture that support the main or most important spaces of the building. **Weight** works with transferences or changes of support on various body parts. This is similar to what structure does in architecture.

Relationships in dance movement are the correspondences or connections between things:

- dancers to each other
- dancers to objects
- dancer's body parts to each other

In architecture similar things happen between objects and volumes: "Objects are rarely isolated; they are in the company of other volumes or limits. Space is born from the relationships

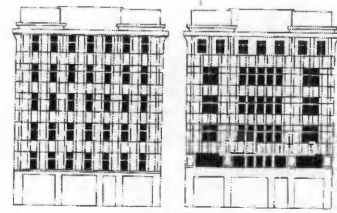


Fig.16. Even and Uneven rhythm in facade through repetition

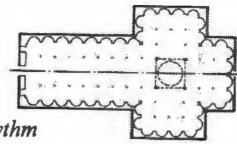


Fig.17. Even Rhythm

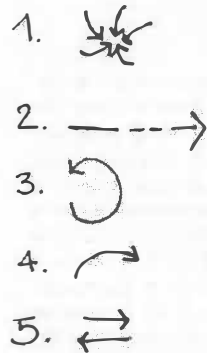


Fig.18. Action diagrams

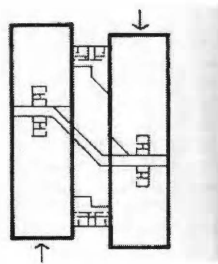


Fig.19. Shifting

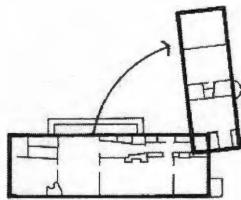


Fig.20. Rotating

between these elements.” (von Meiss, p.96)

From the combination and hierarchy of these components there are spatial patterns derived. Also their combination is what creates sequentiality and simultaneity. The actions derived from the combinations of the different components in dance take form into gestures of the arms, legs and torso which are articulated within their contracting(1), extending(2), rotating(3), tilting(4) and shifting(5) variations (fig.18). In a similar fashion, in architecture, the transformations of a simple organization take place as “actions like ‘rotation’, ‘reflection’, ‘shifting’, ‘shearing’, ‘translation’, ‘displacement’, ‘repetition’, ‘variation’, ‘reversal’, ‘scaling’, ‘inversion’, ‘recursion’, etc., (fig.19-21) [which] are often applied to an initial organization to create more complex arrangements of parts which nonetheless are logically connected to one another.” (Gargus, p.40).

Another important aspect to bring into consideration is how these components are linked to the different levels of consciousness. According to Laban, Space is linked to attention and thinking; Time is connected to decision and intuition; Weight relates to intention, sensing; and Flow is linked to progression and feeling. This relates to the subjective experience of movement and space, therefore to the haptic sense, which is considered as the sense of touch reconsidered to

include the entire body rather than just the instruments of touch, such as the hands. It involves individual's emotional and physical subjective experiences resulting from body sensations created as he interacts with the environment. As a result, structured movement forces attention to the body in relation to its environment, it gives an insight on the characteristics of space. Thus, structured movement is relevant to reinforce the argument of the investigation.

CASE STUDY: DANCE ANALYSIS

DIVINING
choreography:
JUDITH JAMISON

Divining was selected for this case study because is a group performance with a main character, which makes it more clear to identify aspects like sequentiality, simultaneity and hierarchy, among others. There are three major sequences with transitions between them and transitions within them.

Divining it's set in an african environment and it represents the story of a tribe that explores a new land before getting settled in it. The first part of the performance shows the "runners" that come out to the unknown, virgin land to explore it and make sure that it's ok for the leader to come out (fig.22).

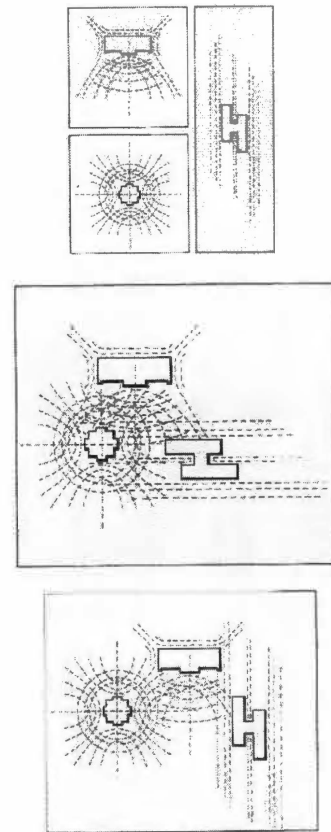


Fig.21. Relationships between spaces



Fig.22. Divining: the beginning



Fig.23. First sequence movement 1



Fig.24. First sequence movement 2



Fig.25. First sequence movement 3



Fig.26. First sequence movement 4

First Sequence: the group

Images 23-26, extracted from the first sequence of the performance, reveal how the repetition of the back and forth movement of the torso in different instances of the sequence sets a common language for the whole group of dancers. They appear as one whole entity.

This introductory sequence sets the environment for the main part of the performance to come forth, as we will see later on the analysis.

Transition

There is a transformation that occurs from the homogenous first part where the group of dancers splits in pairs to perform distincts simultaneous movements.

By shifting their levels (height and foreground/background (fig.27-29), the dancers announce a change in the sequence, making a transition to something that is coming up.

A series of varied movements make part of this first transition that introduces the main character into the performance (fig.30).

There is a notorious difference in the speed and rhythm of the female dancer that is introduced in the scene (slow, paced, continuous), in contrast with the simultaneous, rapid, up and down movements that the two pairs of dancers are performing, This reinforces the importance of the main female character, and starts to create the



Fig.27. Transition movement 1



Fig.28. Transition movement 2



Fig.29. Transition movement 3



Fig.30. Transition movement 4



Fig.31. Second Sequence movement 1



Fig.32. Second Sequence movement 2



Fig.33. Second Sequence movement 3



Fig.34. Second Sequence movement 4

Second Sequence: Climax

After the new element is introduced in the performance, there is a moment where all the dancers join in a unified movement (fig. 31-32)

The transition ends when the main character is left alone on the stage, after going through a series of very rapid movements. The change in speed again announces the next part of the performance that is coming up (fig. 33)

From the last image on this page it is evident that there is a difference between the speed and rhythm of the dancers and that of the main character. While the group of dancers is moving in fast rotations, the main character stays moves slowly in a strategic central position, while the others rapidly pass by her. Thus, in this transition the change of speed is not only from one movement to the other, but it also happens in a simultaneous fashion between group, and single dancer. The shifted timings also contribute to the flow of the sequence.

The second part of the performance shows the female “shaman” who is the leader, making sure the environment is alright for her people to come, blessing the land and liberating it from evil spirits (fig.35)

The climax starts when she performs a solo on stage, starting with rapid rotations and leaps, and back and forth translations (fig.36)

There are also throughout her solo examples of

how she uses her own weight to balance her movements, as we can see on the second image (fig.37).

There is transition within the climax where the dance forcefully moves forward, to then move back and stop. This pause creates a suspense on what's coming next, this moment is the high point of the climax (fig.38-39).

What comes after this is a series of more slow, on place movements (non-locomotor movements), where the dancer works with the balance and equilibrium of her body. Also working with simultaneous movements with her arms and legs (fig.40).

There is a variety of levels that she introduces in this part, where she extends, stretches reaching up and finally goes down and contracts, to start a series of onfloor movements.

The diagrams show an abstraction of the change of level and size (fig.41-42).

After the onfloor movements there is a change of speed, which announces the sequence that is coming next (fig. 43).

Third Sequence: Group and leader

The third part of the performance shows the integration of the whole group, after the shaman decides that is safe to invite her people to come again.

The leader's movements slow down, as the group also slowly approaches the space where



Fig.35. Second Sequence movement 5



Fig.36. Climax movement 1



Fig.37. Climax movement 2



Fig.38. Climax transition



Fig.39. Climax transition 1



Fig.43. Announcing coming sequence



Fig.40. Non-locomotor movements



Fig.41. Levels 1



Fig.42. Levels 2

come again.

The leader's movements slow down, as the group also slowly approaches the space where she is. This reinforces the transition between the solo and the appearance of the group.

There is a hierarchy of the dancer's positions in space, and the pathways that they describe are linear, towards a center which is personified by the main character (fig.44).

The whole final part of *Divining* varies from instances where the main character is introduced as one more of the group (as shown in the last picture), to parts where she stands out from the others.

We can also see how the repetition of the back and forth torso movement creates a continuity with the other parts of the whole piece, giving unity to the entire performance (fig.45).



Fig.44. Hierarchy



Fig.45. Repetition

III: MOVEMENT AND MODERN SPACE

Deriving from the statement that “the communication of dance content is derived from rhythmic-spatial changes in the dancer’s movement” (Maletic, 1978), one can establish an analogy to state that the communication of the building’s content is also derived from rhythmic-spatial changes in its spatial configuration. Which are a response to the program and spatial intentions of the building. These rhythmic-spatial changes must establish a dialogue and articulation between spaces, in order to create a relationship of fluidity and connectivity among them with the intention of activating and linking the experiences that it entails: “Architecture that encompasses motion supports a particular conception of space, one marked by fluidity and liquidity” (Angelil, 2003).

Similar to the premises which modern dance is based on: free flow, fluidity, Modern Architecture promoted continuity of space, space as an infinite continuum, open and flowing.

One way of understanding modern space, as conceived in modern architecture, is through the concept of Anti - Space, as S.K Peterson elaborates in his article Space and Anti - Space. Modern space, a space that has an ambiguous,

complex form, and is undifferentiated. The spatial continuum previously mentioned entails a lack of composition and hierarchy, while on the other hand one can say that a dance choreography is based on a structured composition of movement. The link between dance and architecture/space composition is the choreography that goes behind it. What can make the link in terms of dance informing architecture is dance composition and the elements that are used in it. Structuring movement is like structuring different things that happen in a building, “events”, as Bernard Tschumi calls them. To choreograph the building would be to create the sequentiality of spaces that are in it.

The same way there are transitional movements (steps) or moments in dance, that lead from one scene to the other, in Architecture there are transitional spaces that connect the main hierarchic spaces. These are the “in-between” spaces (in terms of Tschumi): “by their very nature, buildings must combine passages and dwelling places. Physically, of course, all spaces persist in rigid immobility; but visually the occupant must not be smothered by the stagnancy of an assemblage of containers, tied together by corridors that convey no progression” (Arnheim, p.157). Transitional spaces are secondary spaces that help make the connection between the main parts, as they are circulated through, they become

a link that reinforces the unity of the building.

Although mobility can be thought of as “linear and forward-directed”, there exist these transitional moments, which contribute to a hierarchy on the impulse and the speed of movement, leading to the composition of a dynamic ensemble, a dynamic succession of sequences allowing for an energetic and rich progression. One can find a similarity in Architecture when assertions like “any change of shape contributes to dynamics” and “the dynamic effect depends not only on proportion, but also on shape” (Arnheim, p.52 and 49). This implies thinking about Architecture as a configuration of diverse articulated spaces that are connected and where the dialogue between them is what creates the continuity of space. A dynamic whole is also achieved through scale. An excerpt from the book *Ideas of Order* illustrates this further: “Scale in Architecture also has to do with the articulation of buildings into commensurable parts. Articulation is the task of dividing the overall mass of a structure into intelligible, interrelated parts, so that the whole is related to the details, and multiple scales of elaboration are tightly knit together. Articulation may be accomplished by the break down of the building into interrelated masses, [...] it may be accomplished through the rhythmic disposition of windows, columns, piers, or whatever...” (Gargus, p.338).

It is important also to understand how the dimension of time plays a role in the perception of modern space. Space is conceived as a fragmentary reality, as an articulation of moments that are interrelated and juxtaposed. The temporal character of dance relates to this, insofar as a dance piece is a collection of fragments (movements) put together to work, often simultaneously, and that form a unity. To elaborate further on this is appropriate to bring into consideration a fragment from Rowe's and Slutzky's essay "Transparency: Literal and Phenomenal": "Transparency means a simultaneous perception of different spatial locations. Space not only recedes, but fluctuates in a continuous activity" (Rowe, p.161).

LEARNING FROM CASE STUDIES: THE METHOD

1.Looking at La Villette: The Cinematic Promenade.

"The linearity of sequences orders events, movements and spaces in a progression that either combines or parallels divergent concerns". (Tschumi, p.070) (fig.46). At La Villette Tschumi works with the idea of frames and sequences, and makes an analogy to a film strip (fig.47). It's important to understand from the study of la Villette that the different gardens are the frames, they are organized in a sequential manner where "each

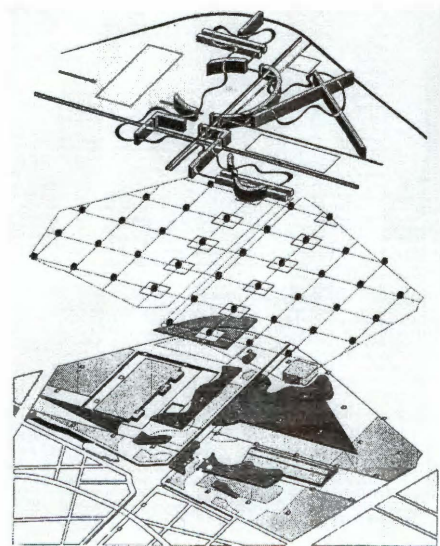


Fig.46. Systems and superimpositions: points - lines - surfaces

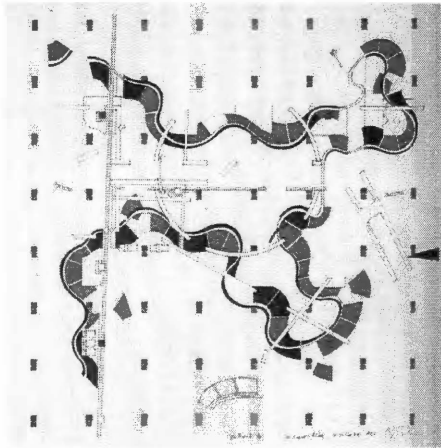


Fig.47. Frames and sequences

part, each frame, of a sequence qualifies, reinforces or alters the parts that precedes and follow it". Also, the combination of these sequences and connections between them allow for multiple interpretations and different promenades. To make a correlation with dance it can be said that dance is linear, it goes forward, it advances, it has a beginning and an end. Each step follows the other, each movement is influenced By the previous one and originates the next one. by translating the different components of dance into architecture we get a series of "moments" (spaces) which are interconnected with one another and can form a spatial sequenciality. Although the promenade and experience of architectural space is not necessarily chronological, and the exploration can have multiple beginnings and ends, the architectural space can direct the movement and by the way it's designed suggest a specific sequence to follow. There is a relation relation, then, between the way several components create a specific movement in dance, and the way elements in architecture can articulate space, as in La Villette: "In literature and in cinema, the realtions between frames or sequences can be manipulated through devices such as flashbacks, jumpcuts, dissolves, and so on. Why not in architecture or in landscape? At La Villette, the cut between two garden sequences is established by means of an intersecting line of trees" (Tschumi,

p.070). These garden sequences establish various ways of going from one to the other, which can go from “accelerated movement”, to “distended 2.The Manhattan Transcripts, Bernard Tschumi.

The Manhattan Transcripts constitute a project of experimenting with architectural representation to address issues that are often not shown in architectural drawings (fig.48-49. These issues include “the complex relationship between spaces and their use; between the set and the script; between type and program; between objects and events”. By combining photographs with plans and diagrams, Tschumi proposes a view at architectural composition based on frames and sequences, as in a film strip. What is relevant to this thesis proposition about the method utilized in the Transcripts is the way architecture is conceived in a sequential manner, similar to how a dance choreography is developed. The sequences that compose specific project are manipulated through superimpositions and juxtapositions of the three different levels that represent reality: the world of objects, composed of buildings abstracted from maps, plans, photographs; the world of movements, which can be abstracted from choreography, sport or other movement diagrams; the world of events, which is abstracted from news photographs (fig. 50).

As in dance, the collection of sequences

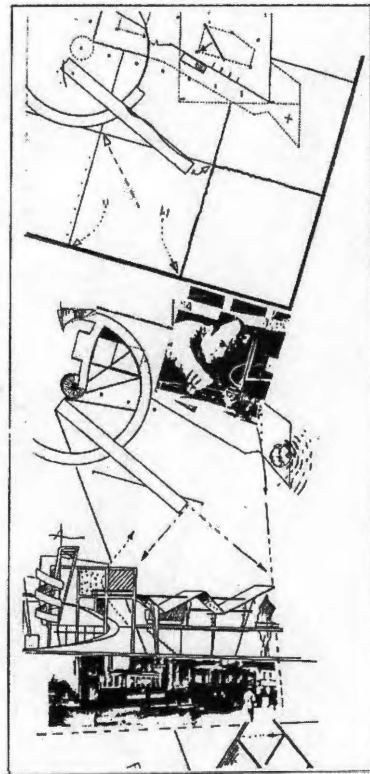


Fig.48. *Superimpositions*

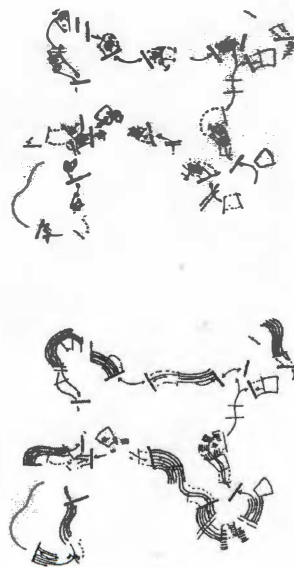


Fig.49. *Accelerated movement, distended movement, slow time*

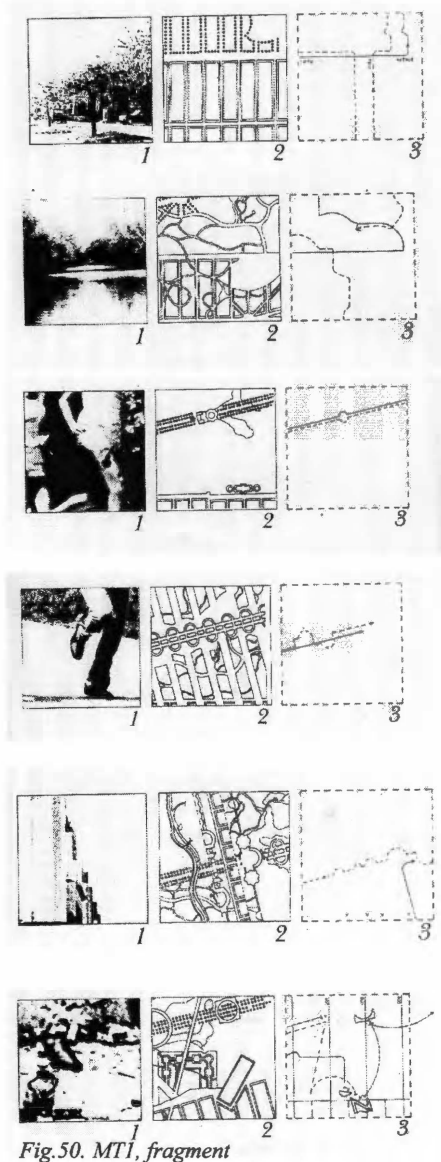


Fig. 50. MT1, fragment

is what gives meaning to each separate frame, the context as a whole integrated piece is then important to understanding each part. Thus, in architecture as in dance their analysis should be done as a memory of the movements that compose them. From the Manhattan Transcripts we can learn that new and unexpected combinations of simple basic elements take place to create different sequences, and that these sequences can be manipulated:

- repetitive sequence
- disjunctive sequence
- distorted sequence
- fade-in sequence
- insertive sequence.

THE FLOW

1. Kunsthaal in Rotterdam, Rem Koolhaas

The Kunsthaal is located in Rotterdam, The Netherlands, its program is constituted by 3 major exhibition spaces, an auditorium, an independently accessible restaurant. The southern edge of the building is bordered by a highway, the Maasboulevard, while the northern edge opens to the Museum Park, in a lower level (fig.51).

The concept of the Kunsthaal is a continuous circuit that breaks down into smaller circuits.

The ramp that traverses the building from North

to South separates the building in different parts and at the same time gives the possibility of accessing them consecutively (fig.52-53).

The main ramp is a public open ramp that has a connection with other smaller interior ramps. The possibility of traversing the entire building by ramps makes the flow continuous. The movement is directed North - South when going through this public open space, the direction changes when entering the auditorium, the restaurant, or the different halls. There is no predominant direction when traversing the halls (fig.54).

Different types of columns and rhythm were conceived to emphasize specific spaces. The inclination of the columns in the auditorium gives an idea of the quality of movement experienced along the space.

The four circular columns along the main public ramp emphasize the direction of the upper ramp that goes to the green roof. The rhythm created by them is also different from the internal columns in the auditorium and the restaurant, they convey distinct spatial configurations (fig.55).

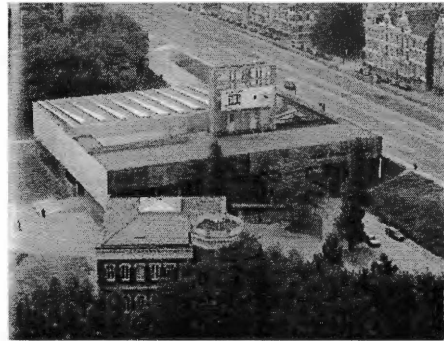


Fig.51. Aerial view towards Maasboulevard

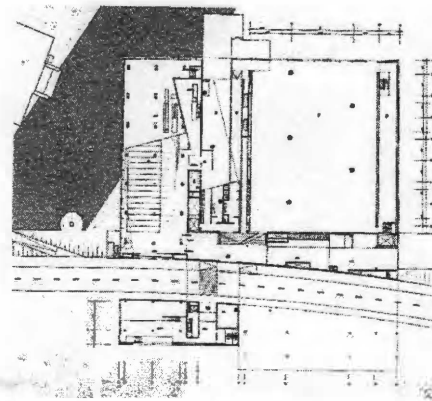


Fig.52. First floor plan Kunsthall

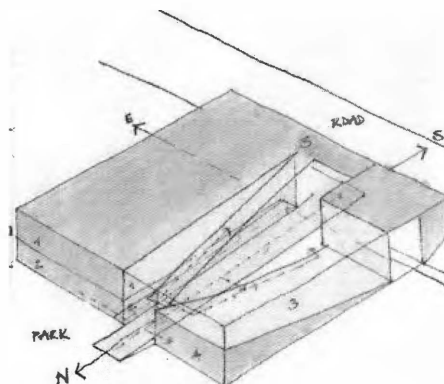


Fig.53. The continuous circuit of the ramp

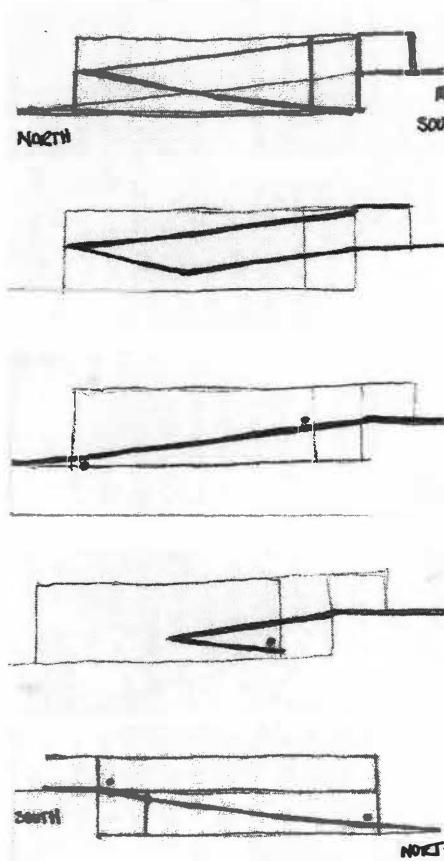


Fig.54. Diagrams in section showing different circuits possible from the main ramp

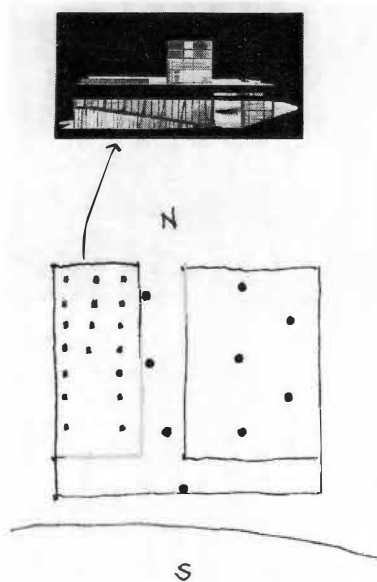


Fig.55. Rhythm of the different sets of columns

THE SEQUENCES AND TRANSPARENCY: INTERPRETING
MOVEMENT.

1. L'Opéra de Paris, Charles Garnier

Garnier's Theory of Composition was based on four aspects: distribution, disposition, composition and character. Distribution referred to the programmatic division of a building into its separate functions, disposition to the spatial organization of those functions in plan, composition to the three dimensional development of the spaces in a unified whole, and character to the how that coherent composition had an expressive result (fig. 56-58).

The composition had to start, according to Garnier's Theory, by defining what the major parts of the whole were, and by placing them in the plan according to what the relationships between each other should be. Identifying these major parts would be a consequence of gathering all the parts, 'articles', as he calls them, of the program into dominating parts. He would then proceed to define the heights, the volumes, and continue with the articulation of voids and solids. Garnier's theory of architecture presented it as a theater where the social interaction took place, where architecture was the stage and people that where in it were the actors. He believed that the composition of architecture should follow the

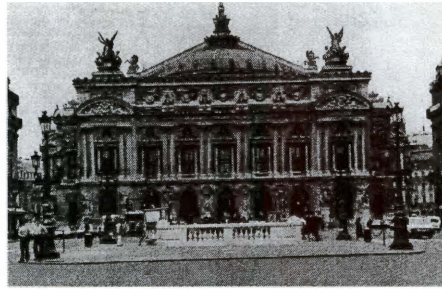


Fig.56. Front facade

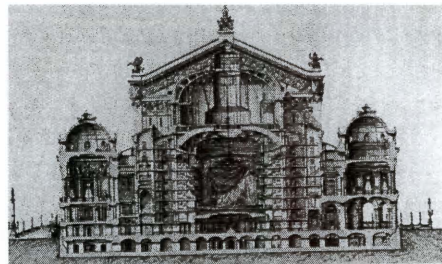


Fig.57. Transversal section

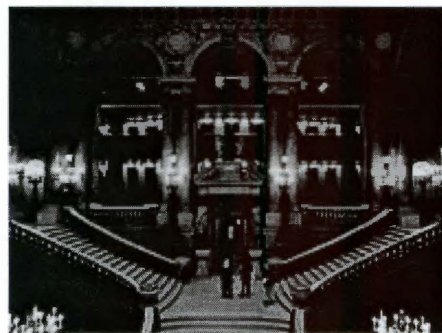


Fig.58. Le Grand Escalier 1

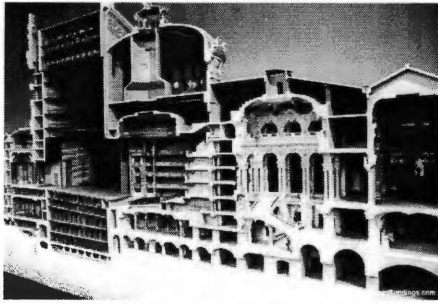


Fig.59. Model of longitudinal section

natural interaction and flow of people:

“Paraphrasing Shakespeare’s famous lines - ‘All the world ‘s a stage, And all the men and women merely play ers’ - Garnier was translating a literary conceit into architectural terms. Informing this translation was his belief in the symbiotic relationship between human nature and architecture, in which built forms are seen as a consequence - not as a determinant - of social actions”

(Mead, p. 114)

In the design of L’Opéra Garnier studies the different movements within the building, according to the different types of public that would come visit it. The movements would differ depending on how the public entered the building, and the paths they would take to reach the auditorium. The disposition of spaces in L’Opéra was conceived as the result of the public’s “evolution naturelle” through the building. L’Opéra includes places of rest, or transitions, in the front part of the building as well as to the sides (fig. 59). These places of rest are the vestibules, which indicate the path of movement to finally go to the auditorium. As a consequence, when entering from the Place de l’Opéra, or the front facade, the sequence of spaces to arrive to the climax,

would go from the Portico (this being the transition from the street to the building, still being on a public realm), to the Grand Vestibule (which acts as a gathering place to socialize), to the Vestibule de Contrôle (which is where the preamble for the performance starts), to consequently reach the Grand Escalier, which leads to the auditorium (fig. 60-62). Although they are all stages to get to a final point, their character is specific and differs from one to the other in terms of how people move through them and the way they interact in each of them. In L' Opéra there is a flow that goes from the street to the auditorium, where there are different speeds, and where sometimes the sequence stops its course, to resume rapidly and continue the flow. The Portico and Grand Vestibule are spaces where the movement can actually stop at one point, since they are spaces to pass through but also spaces to rest and intermingle. The movement speeds up when entering the Vestibule de Contrôle, since its basic function concerns handing in the tickets to enter the auditorium. The continuity of the flow proceeds when ascending through the Grand Escalier, the movement varies from the users that simply want to go up or down, to the ones that slowly stroll enjoying the social scene that the monumental stairs offer.

Lastly, there is something very interesting in the way how the Vestibules are arranged in

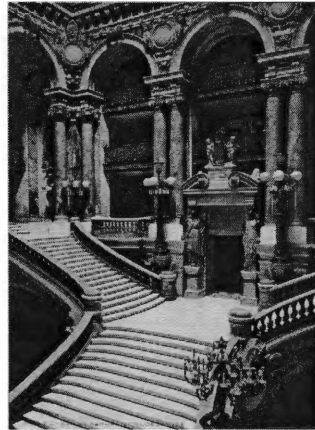


Fig.60. *Le Grand Escalier 2*



Fig.61. *Le Grand Escalier 3*

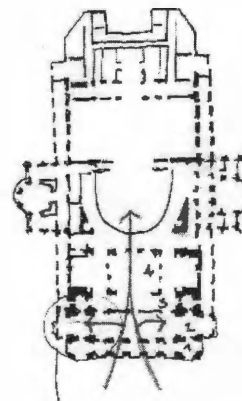


Fig.62. *Ground floor plan, direction of movement*

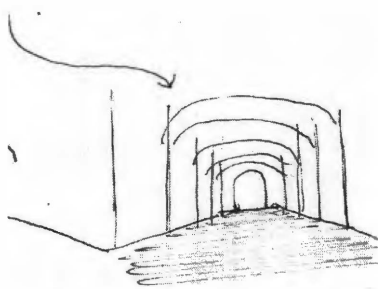


Fig.63. Rhythm and direction of le Grand Vestibule

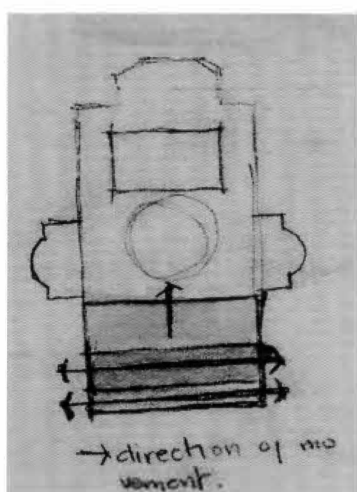


Fig.64. Direction of movement and transitions

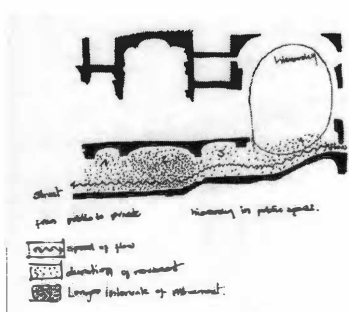


Fig.65. Choreography of spaces: hierarchy and transitions

a rhythmic disposition, directing the movement across the building, from side to side, towards or from the side entrances (fig. 63-65).

“This sense that architecture gains meaning only when viewed by a spectator moving around and through a building justifies the thesis of Le Théâtre: what is shaped by human action must be comprehended by human action”
(Mead, p.114)

2. The Laban Centre for Movement and Dance. London, England. Herzog and de Meuron.

The Laban Center is located on the Thames River in Deptford, to the south of London. Its program includes an auditorium, located in the center of the building, teaching and studio spaces, the primary ones located in the third floor. These spaces are the major threshold into the performance space (fig. 66-67). The program also includes administrative spaces and cafe and library spaces. The administrative spaces along with the teaching and studio spaces are important in the creation of the transition to arrive to the climax of the Center which is the auditorium. They surround completely the performance space, reiterating the idea of layers and permeability

conveyed throughout the building. The materiality of The Laban Center consists predominantly of the use of glass and polycarbonate, mostly used in a vertical orientation, combined with black laquered concrete, which is used in a more horizontal orientation for the most part. The drastic contrast of materials allows to create the experience of a continuous flow due to the strong presence of the black concrete which directs the movement through the circulation paths. Also, the diaphanous character of the glass and polycarbonate allow for a simultaneous understanding of the different spaces, and help partially display the activities that take place in the studios, both to the inside as to the outside. Thus, the building becomes a displaycase for movement. The permeability of these spaces varies, always maintaining the fluidity between spaces that are articulated in a way that the final goal of the circulation -the auditorium- is conceived as a solid volume, in the innermost part of the building, giving the opportunity for darkness and controlled lighting conditions (fig. 68-70).

The circulation paths carve out the building in two instances acting like the dancer when making his way through space, creating tensions and rhythm between spaces through their contraction and expansion. They also allow for the differentiation of zones like teaching zone (private), and the performance zone (public). The

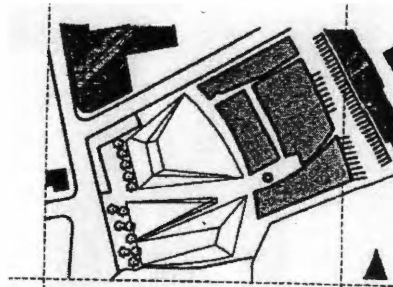


Fig. 66. Site plan

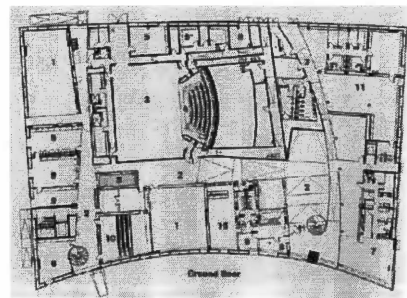


Fig. 67. Plan



Fig. 68. Interior circulation

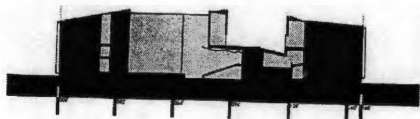


Fig. 69. Section showing central hierarchical space

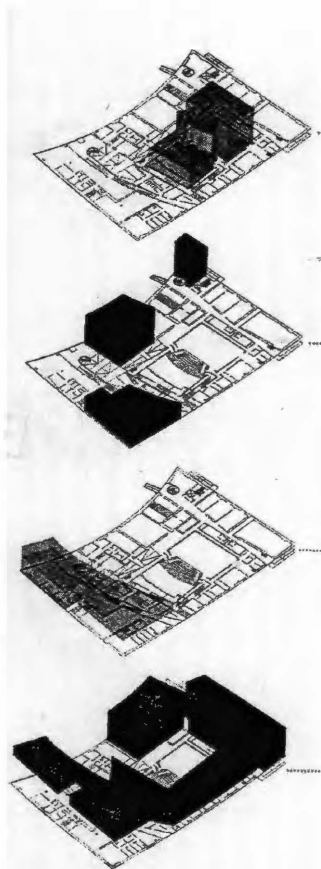


Fig. 70. Exploded volumetric axon of transition spaces and core

private studio and teaching spaces are pushed to the outside to take advantage of light conditions and to project the dance experience to the outside, giving the building a dynamic condition as moving masses are perceived through its walls from the street (fig. 71-72).

As far as program location, the main dance studios are situated on the third floor, having as a supporting plinth the secondary spaces like library, administrative, therapy, cafe. Other studio spaces are located in the rest of the floors. The library and cafe spaces occur along the circulation path on the first floor, forming part of the contraction and expansion of the former.

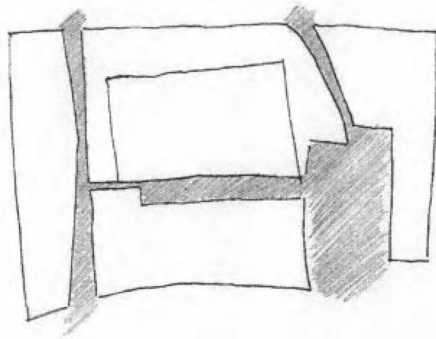


Fig.71. Circulation carving out space and fragmenting it

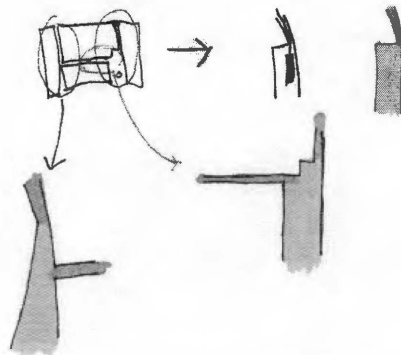


Fig.72. Tensions created by the contraction and expansion of the circulation spaces

**IV. PROGRAM PROPOSED: DEVELOPMENT
AND REFINEMENT OF PROGRAM.**

First program proposal

Site: Astor Place between Lafayette Street and
Cooper Square.

Lot area: 17 837 sq. ft

Program: Cultural Center

Precedents: Scandinavian House, NY
French Alliance, Bogota

Considerations for the program:

Deriving from the study of this investigation
there are specific elements that can be identified
in order to create a program that is drawn from
this analysis.

Hierarchy of spaces where there is one main
important space (the Climax). This space would
have a public character, giving the opportunity
for people to gather. The Cultural Center would
have as its main space a Lecture Hall that
accommodates 300 – 400 seats, approximately
3000 sq. ft.

Transitional or secondary spaces that are
interconnected with the primary space, and that
act as threshold to get to it. The progression
through them would create the “architectural
promenade”.

- Administrative spaces
- Gallery (exhibitions)
- Seminar rooms (for language
teachings or meetings)
- Dining area
- Shop
- Children’s space?
- Public open space

Sequencing and Articulations the spaces in the program should be articulated in a way that they create an identifiable sequence.

One of the primary issues that would be addressed in the project would be two distinct types of public that would come to the building, and the different paths and experiences that these users would be able to circulate through. Also issues like the progression that starts with the approach to the building, continues with its access, to the circulation through it. Creating a fluid sequence of activities and space.

The program would alternate from primary to secondary spaces, instead of concentrating activities in one place.

Spaces open to the public:

- Auditorium (lecture hall)
- 2 Exhibition spaces
- Media center/library
- Dining area
- Shop
- Reception area

Staff spaces:

Center director
Assistant
Reception (1)

Cultural division

- Person in charge of media center/library
- Person in charge of logistics and exhibition space
- Press

Administrative division

Academic division

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Appendices

APPENDIX 1: PROGRAM ANALYSIS

Spaces available to the broader public/ PUBLIC SPACES			
• Welcome area / restrooms			
Must include a reception desk where a person can work and waiting area.			
			Minimum height: 18 ft.
• Collective spaces: Atrium	minimum height: 18 ft.		
	Terrace(s)		
• Exhibition spaces	+/- 4000 sq.ft	-Permanent collection gallery (art collection)	
		-Flexible gallery for incoming exhibitions (products fair, design exhibitions, gastronomic fairs)	
		-Storage area/back of house	
		minimum heights: 18ft	
• Bookstore/Shop		1500 sq.ft	minimum height: 10-12 ft.
• Cafeteria		1500 sq.ft	minimum height 10-12 ft.
• Auditorium	+/- 3000 sq.ft	minimum height 18 ft.	
- Lobby space			
- Restrooms			
- Coat check			
- Ticket sales			
- Information and promotion (can be part of welcome area of building)			
Spaces for internal functions of the center			
SEMI PRIVATE SPACES			
• Mediatecque	2000 sq.ft	minimum height 10-12ft.	
- Computer area			
- Space for keeping texts and audiovisual material			
- Space for consultation (with desks, and lounge area)			
- Storage space for equipment	250 sq.ft		
- Small space for projection	200 sq.ft		
• Teaching rooms (flexible spaces that can open up to one big space for a workshop)			
• Meeting room			
PRIVATE SPACES			
• Center Director's office/ small meeting space in it.	200 sq.ft/ min.	height 10 ft.	
• Assistant's office	100 sq.ft.		
• Meeting/seminar room	300 sq.ft		
Cultural division			minimum heights 10-12ft
• Person in charge of mediatecque/library			100 sq.ft
• Person in charge of logistics and exhibition space	100sq.ft		
• Press/ media department	100sq.ft		
• Storage		100 sq.ft	
• Curator		100 sq.ft	
• International affairs division	100 sq.ft		
Administrative division			minimum heights 10-12ft
• Administrator's office	100 sq.ft		
• Finances		100 sq.ft	
• Studies abroad			
• Mail/copying room	150 sq.ft		
• Waiting area			
• Restrooms			
• Internal kitchen		80 sq.ft	
Academic division			minimum heights 10-12 ft
• Academic coordinator's office	100 sq.ft		
• Teaching staff lounge	150 sq.ft		
• Preparation area for each staff member	60 sq.ft		
• Area to store teaching material			
• Student lounge		150 sq.ft	
• Restrooms			
Maintenance			
• Locker rooms for janitors			
• Maintenance room			
• Mechanical room			
• Freight elevator			
ENTRIES			
1 main entrance			
1 back entrance for downloading			
auditorium:			
2 means of egress			
1 exit connected to downloading zone			

Fig.73. First quantitative program description

Public Components	Area	Path	Conceptual Density	Notes Character/Moment in choreography
Main entry/ Building lobby/ Grand inside stair	2000 - 3000 sq. ft min. height 18 ft	A	Open, high area	The lobby will be a transparent space from where you can see towards both sides of the building - astor place and outdoor grand stair- . It is a threshold for the building as well as a first glance at what the program of the building is. It should represent the identity of the Culture Center. Conditions of light are important. It serves also as a transition to get to the cafe. It is the first moment of the choreography coming from the north side of the building. It is where path A begins, the speed of the street slows down when you enter and the flow of the path takes you directly to the grand stair. The movement up the stairs creates a rhythm where you move constantly yet contemplating the outside movement which faces the facade of the building. It creates a juxtaposition of two movements: the rapid flow of the street and the slower flow of the stairs. The speed within the flow of the stair changes from faster to slower when arriving at the landings, where it is possible and actually intended to stop and look out the street, or inside the building. When arriving to each floor, the program is revealed as you move up, creating a duality between what is happening outside and inside.
Outdoor Grand Stair/ Platform	approx. 3000 sq. ft	B	open	The outdoor stair carves out the space between the two main buildings. It creates a slow transition from the ground floor to the entrance of the auditorium. The choreographic intent is that it reveals the program of the building slowly, having the constant movement and activity of the streets as beginning and end points. Starting from 4th ave. in front of Cooper Union, the stair goes up giving a direct relationship with the cafe, and having a climax at the platform, where different directions can be taken. Its culmination is at the same time the beginning of the experience through the auditorium. It acts as part of the auditorium lobby and connects the most public components of the building -cafe/ auditorium/galleries-

Fig. 74. Detailed qualitative and quantitative description of program page 1

Public Components	Area	Path	Conceptual Density	Notes Character/Moment in choreography
Auditorium	approx. 4000 sq. ft min. height 24 ft. seating capacity: approximately 300	B	partly massive partly transparent	The Auditorium sequence consists of two moments, in addition to the previous sequence of the grand stair. First, the lobby, where one goes from a contemplative experience with Lafayette St., to an enclosed space that connects visually with the street on the other side -4th ave.- This visual connection drives you into the space, taking you to the stairs that go up to the auditorium. Once in the auditorium, the view opens up creating an urban background for the stage. The view of Cooper Union is the culmination of the trajectory. Acoustic conditions are necessary. Projection booth provided.
Cafe	approx. 2000 sq. ft min. height 18 ft.	B	partly massive partly transparent	The Cafe creates a condition of simultaneity, where people can enjoy their meals both outside and inside. It is a deviation from path B. A stopping point at the beginning of the path. It acts also as a pass through from Lafayette st. to 4th ave. A kitchen is provided in adjacency to the loading dock, freight elevator and service area. It is open to the most public part of the building, directly connected with the main lobby and the mediatecque. It has an urban character, as well as scholastic purposes.
Gift Shop/bookstore	approx. 500 sq.ft.	A	transparent	It is part of the auditorium lobby. It is the only enclosed space in the lobby.
Ticket sales	approx. 150 sq. ft	B		It is a part of the auditorium lobby.
Coat check room	approx. 300 sq. ft	B		It is a part of the auditorium lobby.
Info/Promo	approx. 150 sq. ft	A	open space	Information and Promotion is an open space within the lobby, where people are welcomed. It displays all the current exhibitions in addition to academic activities and services (translation for example).

Fig.75. Detailed qualitative and quantitative description of program page 2

Public Components	Area	Path	Conceptual Density	Notes Character/Moment in choreography
Gallery/exhibition	Gallery 1 approx. 1500 sq.ft min. height 20 ft. Gallery 2 approx. 1000 sq.ft min. height 20 ft. approx. 400 sq.ft.	B	High areas	Temporary collection Gallery is bigger than Permanent Collection Gallery. The character of the space is open, acting also as a pass through from the outside Grand Stair to the Permanent Collection Gallery. It is a transition within the sequence of public spaces -from outside to inside- Permanent collection Gallery is viewed from the Grand Stair that faces Astor Place. It is the intermediate layer of the main building. Small Storage room is provided adjacent to this gallery. Curatorial area. Adjacent to Permanent Collection Gallery.
Public Restrooms	approx. 500 sq.ft	B		The larger and most public restroom area of the building is provided adjacent to the cafe. On each floor a set of men/women/handicapped restrooms are provided.
Administrative Components				
Executive Director's office	approx. 250 sq.ft approx 390 sq.ft	C		An open area for administrative aid must be provided. Open area for 2 secretarial stations. Small seating reception area. Conference room approx. 14'x 28' also a small 18' x 6' storage room is provided.
Executive Director's office	approx. 250 sq.ft	C		An open area for administrative aid must be provided. Open area for 2 secretarial stations. Small seating reception area. Conference room approx. 14'x 28' also a small 18' x 6' storage room is provided.
Admin. Suite	sq.ft	C		Director's office Director of Foreign Studies' office Comptroller's office Mail/copy room Conference room kitchen secretarial stations

Fig.76. Detailed qualitative and quantitative description of program page 3

Administrative Components	Area	Path	Conceptual Density	Notes Character/Moment in choreography
Cultural division/ Office suite	approx.750 sq.ft	C		Mediatecque Director's office Director of International Affairs' office Press/Media Director's office Conference room secretarial stations
Academic Division	approx.800 sq.ft for classrooms	C		3 classrooms for about 10-12 students each. To be used days/ evenings/weekends. Also flexible partitions to be used for semi- nars and meetings according to the number of people. Academic coordinator's office provided with adjacent storage space Open space for staff cubicles Teacher's lounge Student's lounge. This will also provide a pass-through to access the terrace on the other building. It is a transition between the two buildings and offers a contemplative view of Cooper Union. It is both a stopping point and a passage. It is a meeting point of two paths. Small storage room
Education Mediatecque	approx. 1000 sq.ft			It is adjacent to the main lobby. It includes bookshelves, flat files for maps, consultation area, storage space, projection screen, desk for staff member.

Fig. 77. Detailed qualitative and quantitative description of program page 4

Building Service Components	Area	Path	Conceptual Density	Notes Character/Moment in choreography
Loading Dock/ Delivery Area	approx.700 sq.ft	D		Space provided for a 15 feet long truck to park and unload. Freight elevator adjacent to the loading dock Provides staff entrance to service area of the cafe and connected with the auditorium and gallery storerooms by the freight elevator.
Building Maintenance	approx.600 sq.ft			small office for building manager provided adjacent to freight elevator. 10'x 8' Locker rooms for maintenance staff provided on 4th floor of service building. approx. Storage area for cleaning equipment and supplies on 4th floor of service building.
Store rooms/ warehouses				A storeroom for temporary storage for the galleries is provided on 2nd floor of the service building. approx. 500 sq ft. A storeroom for storage of the auditorium is provided on 2nd floor of the service building adjacent to auditorium lobby. A warehouse storage for permanent storage is provided on 4th level of service building. approx. 750 sq. ft.
Vertical circulation				3 public 8'x8' public elevators: 2 in main building and 1 in auditorium building 1 freight elevator adjacent to delivery area and cafe 2 fire stairs.

Fig.78. Detailed qualitative and quantitative description of program page 5

APPENDIX 2: SITE ANALYSIS

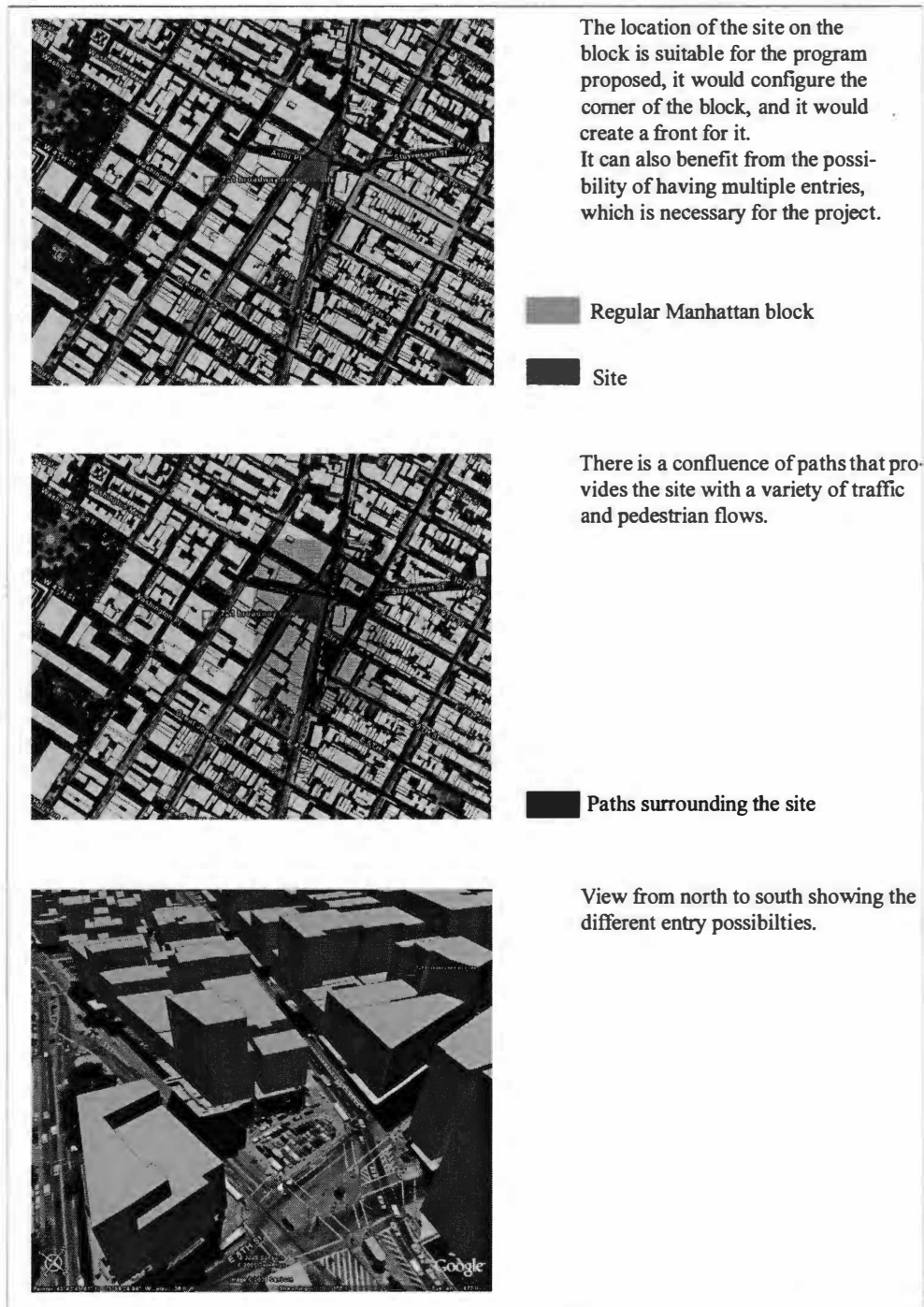


Fig.79. Preliminary site analysis



Fig.80. Choice of site: accessibility



Fig.81. Choice of site: location

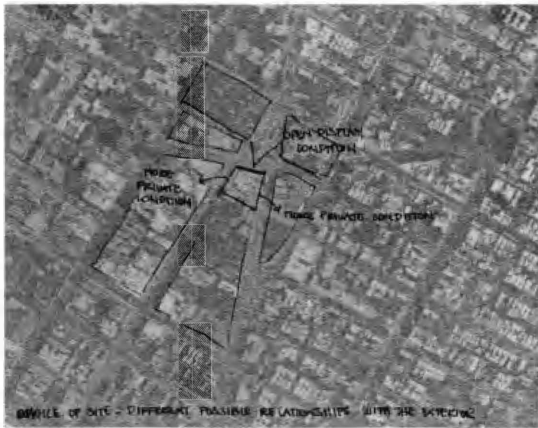


Fig.83. Choice of site: relationships



Fig.83. Uses around the site



Fig.84. Bus routes

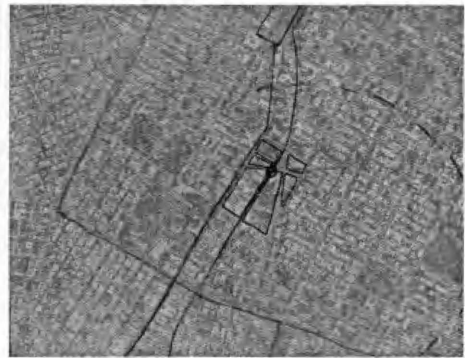


Fig.85. Subway routes

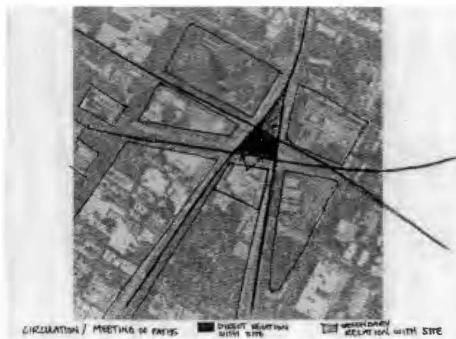


Fig.86. Meeting of paths

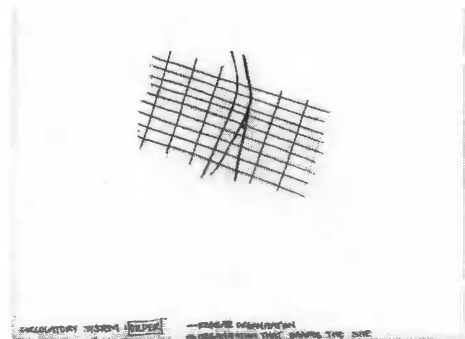


Fig.87. Circulation system



Fig.88. Composite circulation diagram

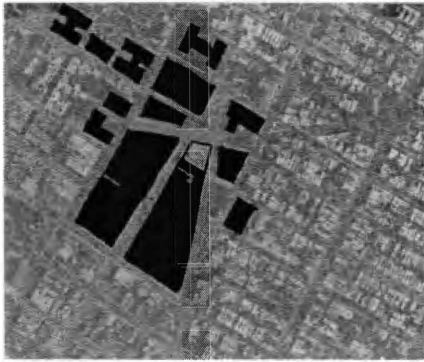


Fig.89. Irregular blocks

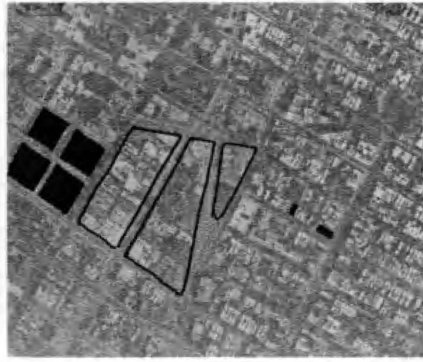


Fig.90. Regular blocks

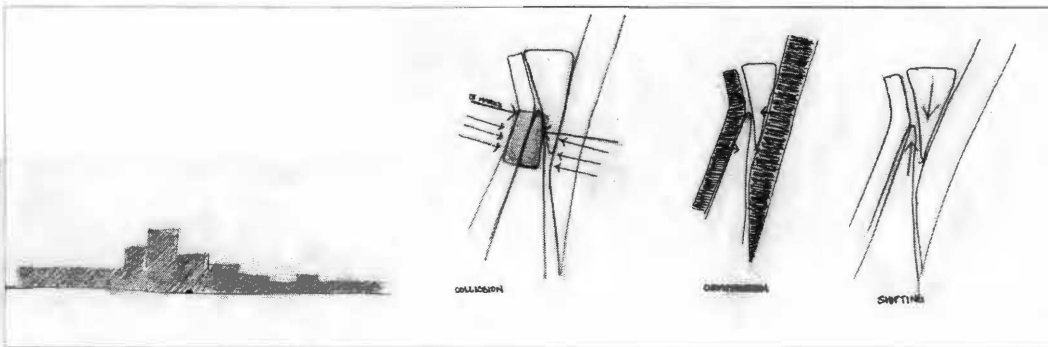


Fig.91. Diagrams

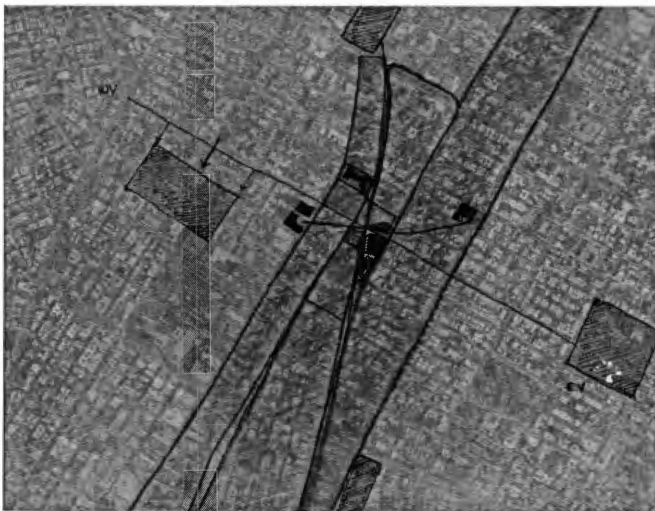


Fig.92. Composite diagram



Fig.93. Wedge shaped corners



Fig.94. Cooper Union

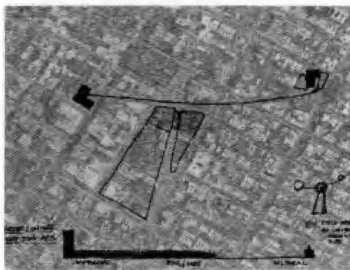


Fig.95. Particularities of site 1



Fig.96. Particularities of site 2



Fig.97. Particularities of site 3

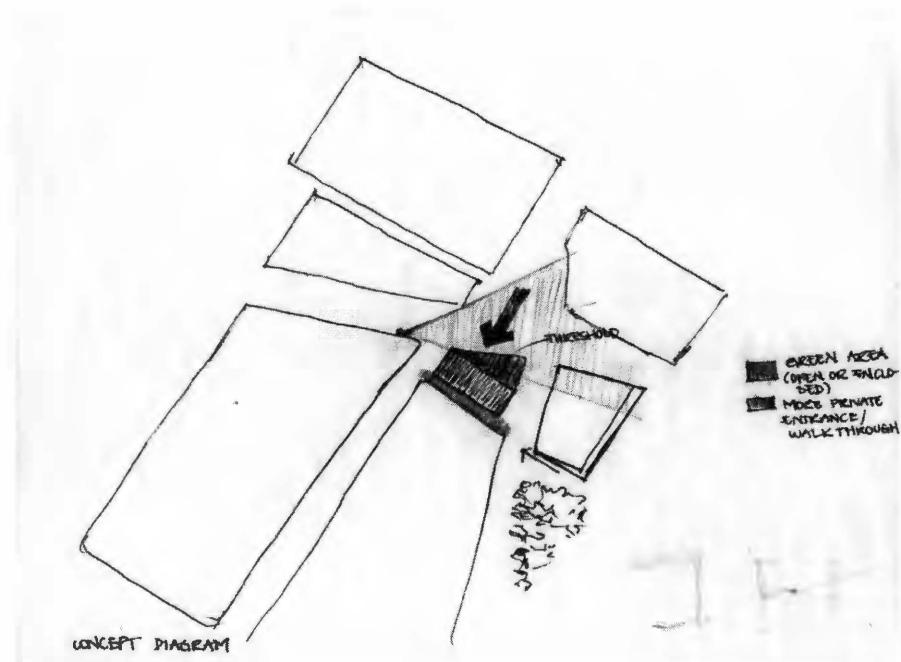


Fig.98. Concept diagram



Fig.99. Site images

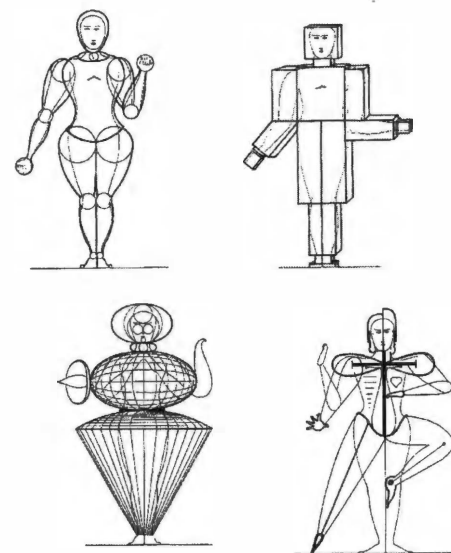


Fig.100. Site aerial photograph

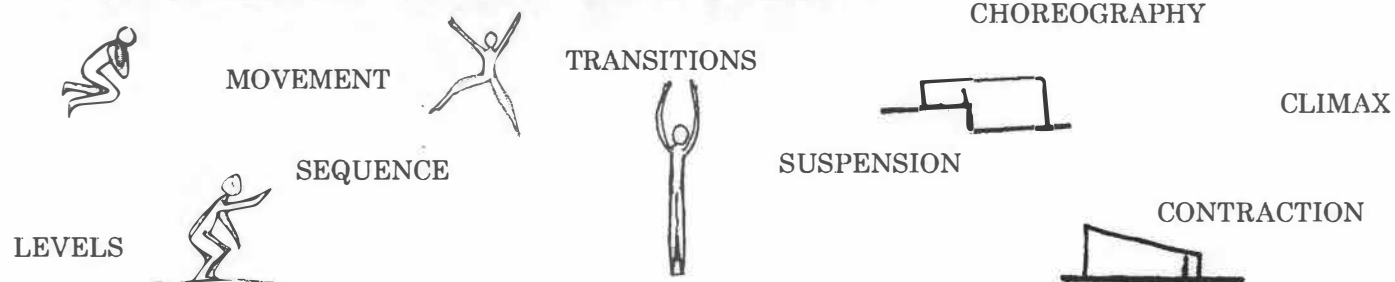
APPENDIX 3: DESIGN SOLUTION



UNDERSTANDING SPACE THROUGH THE EXPERIENCE OF DANCE A PROPOSAL FOR A SOUTH AMERICAN CULTURAL CENTER IN NEW YORK



CHOREOGRAPHY



"there are ceremonies that determine space and spaces that determine ceremonies": the choreography of the outside-inside...

Fig.101. Intro plate

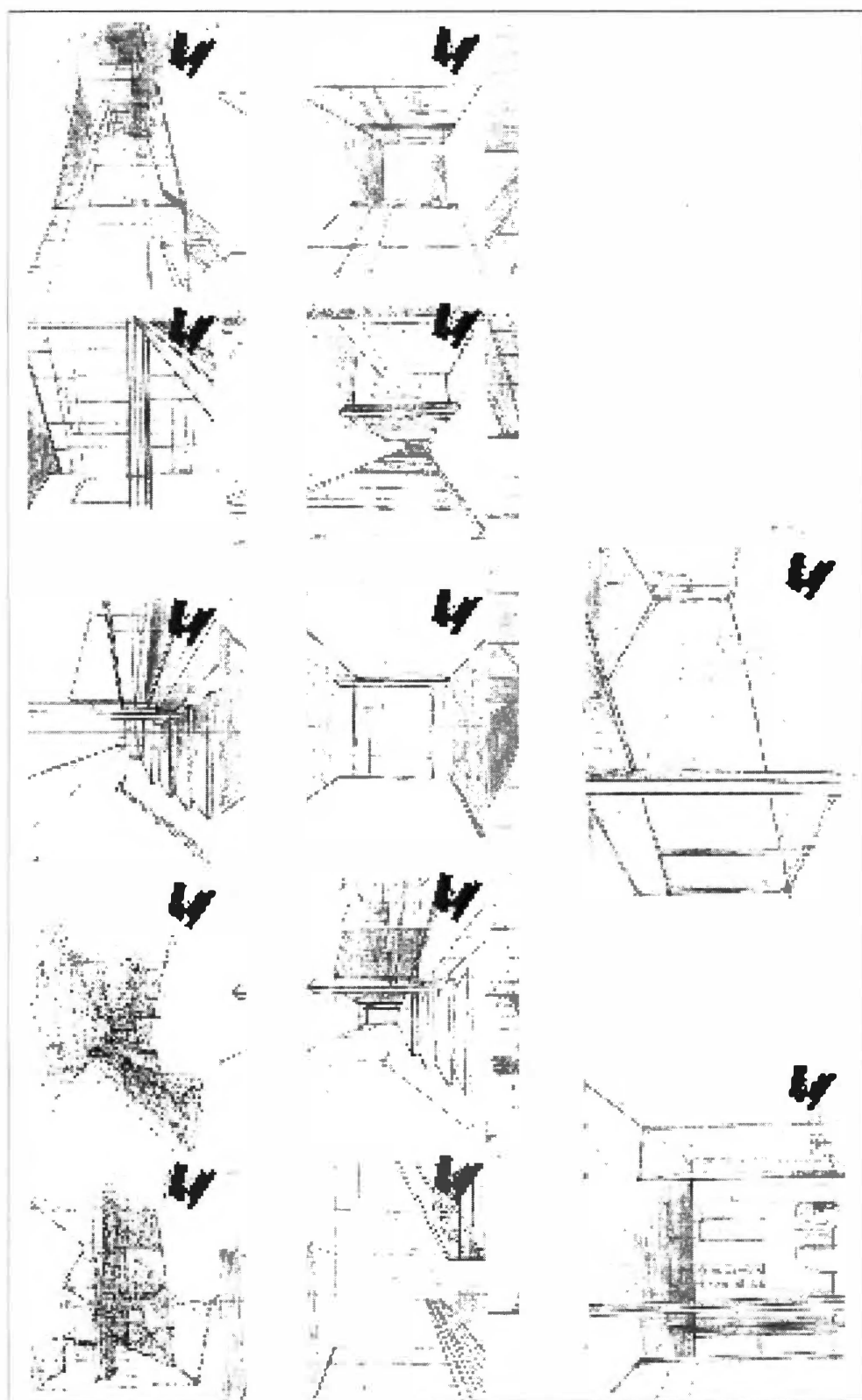


Fig.102. Sequence path A

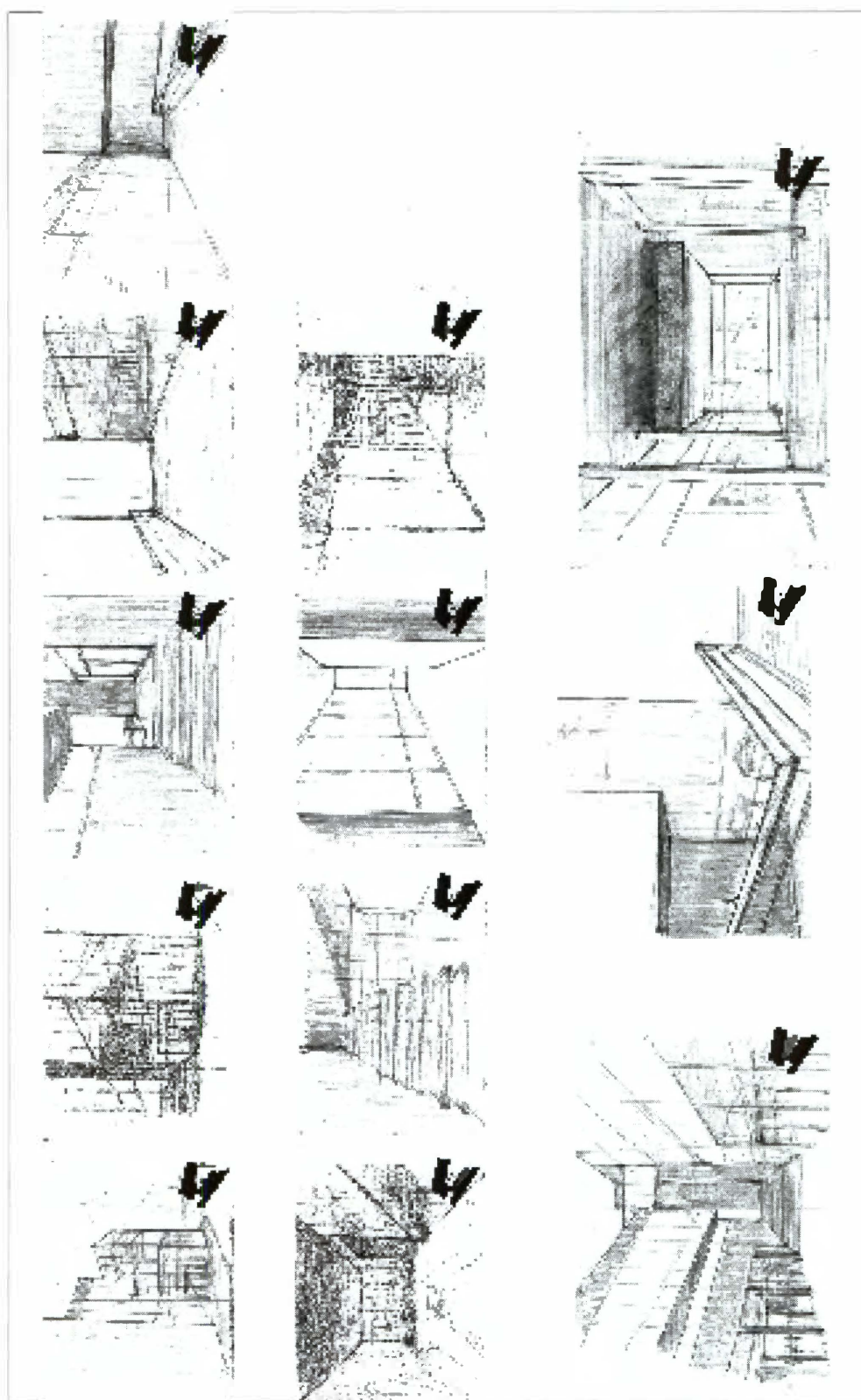


Fig. 103. Sequence path B

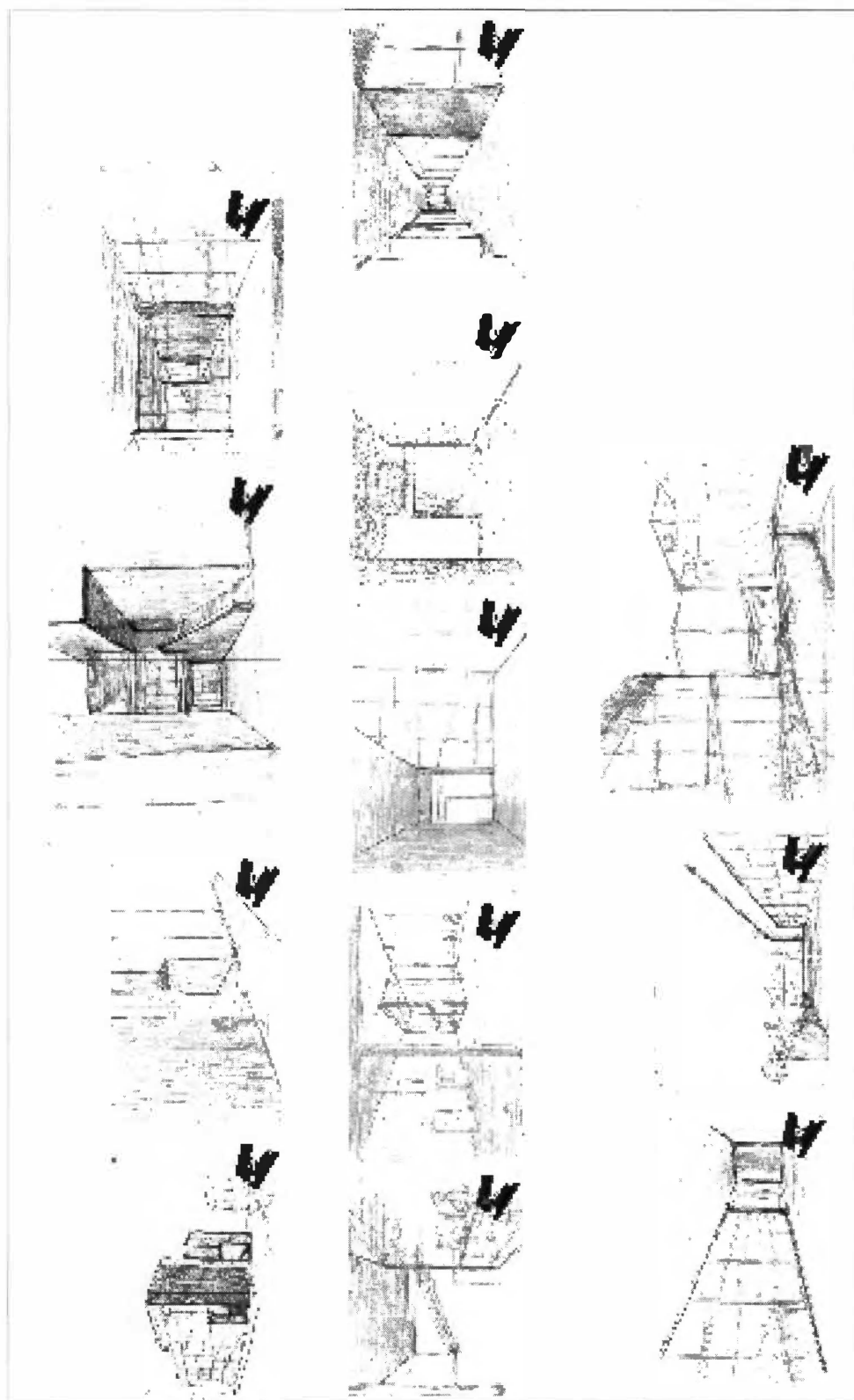


Fig. 104. Sequence path C

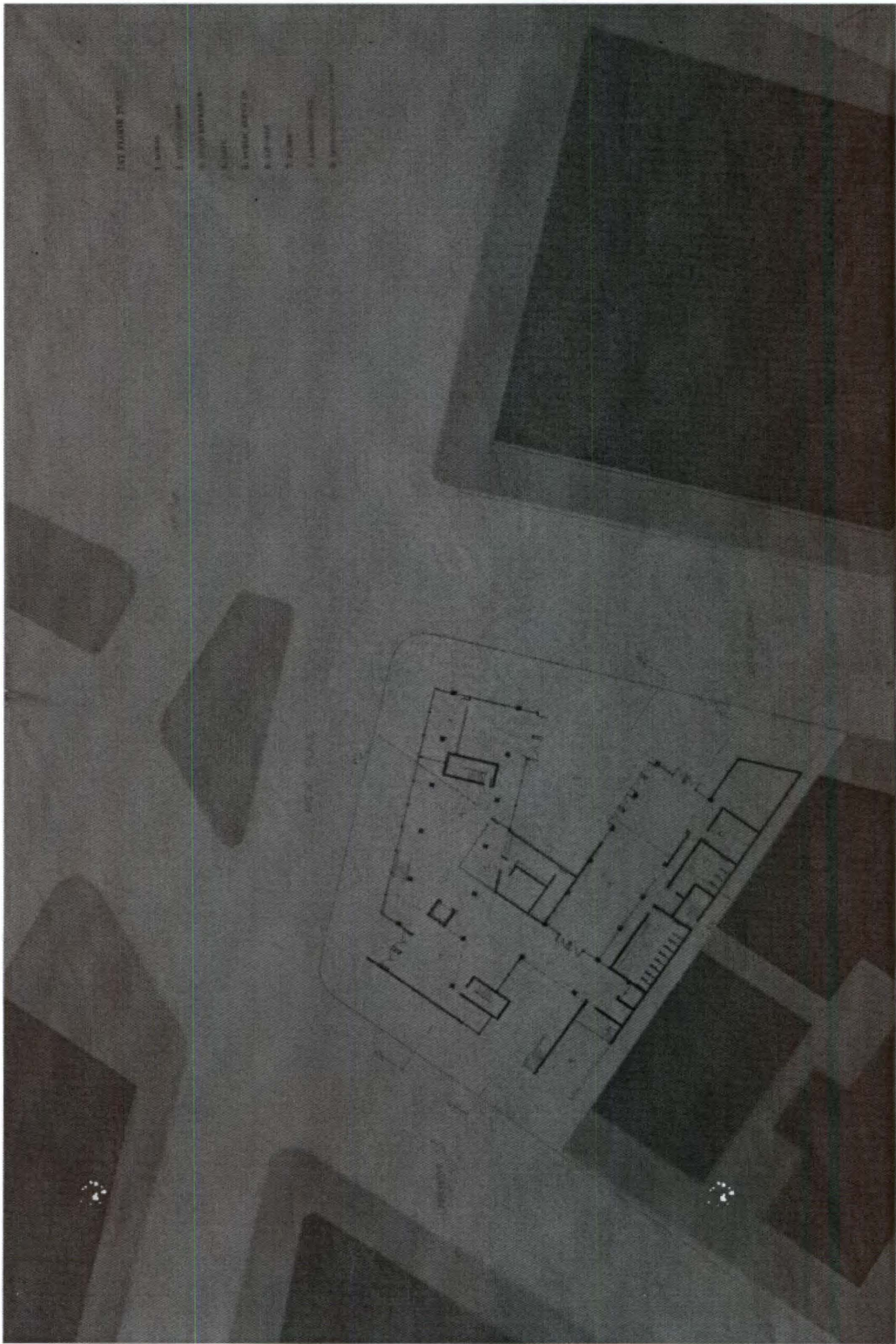


Fig.105. 1st floor plan

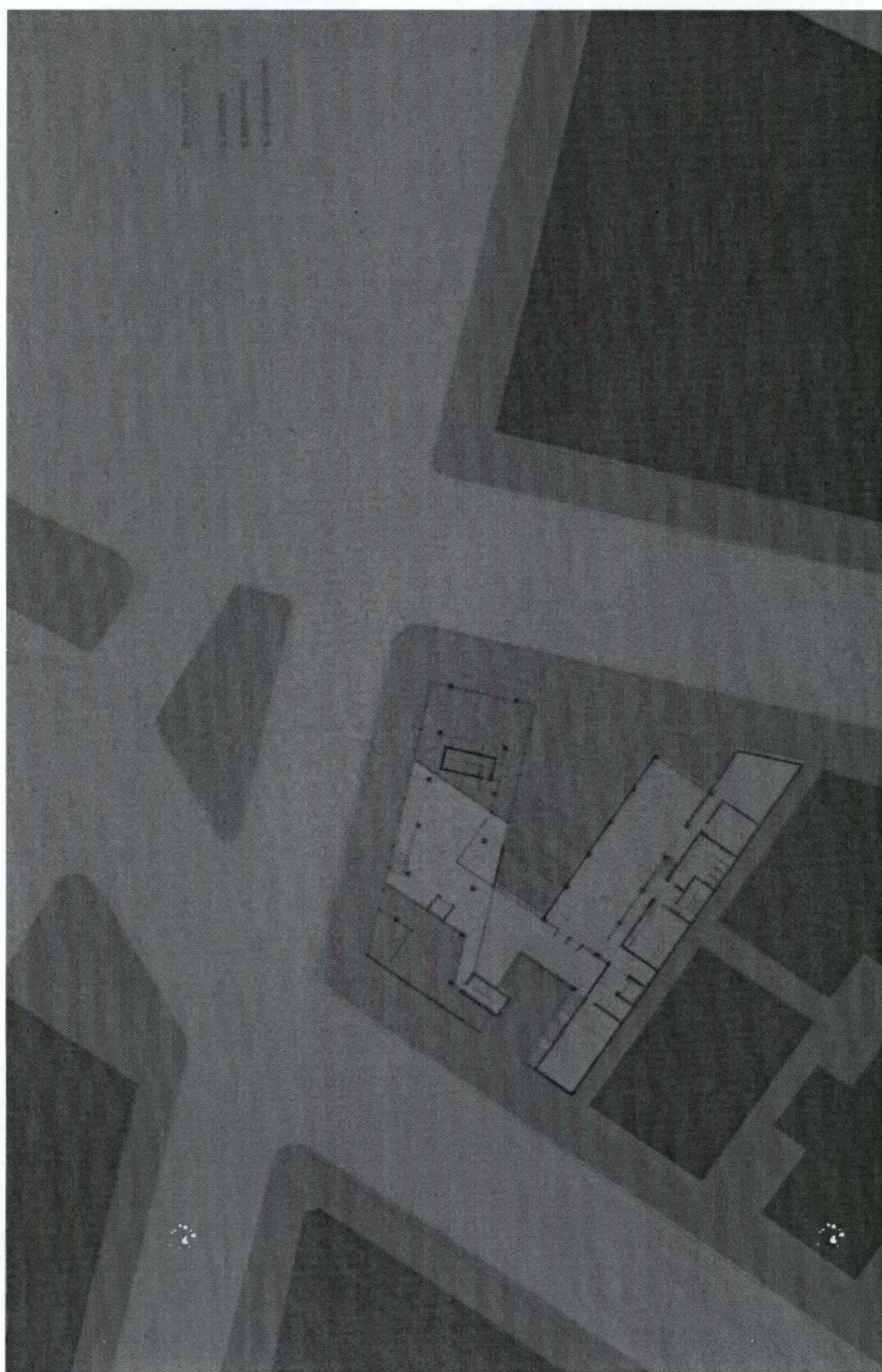


Fig. 106. 2nd floor plan

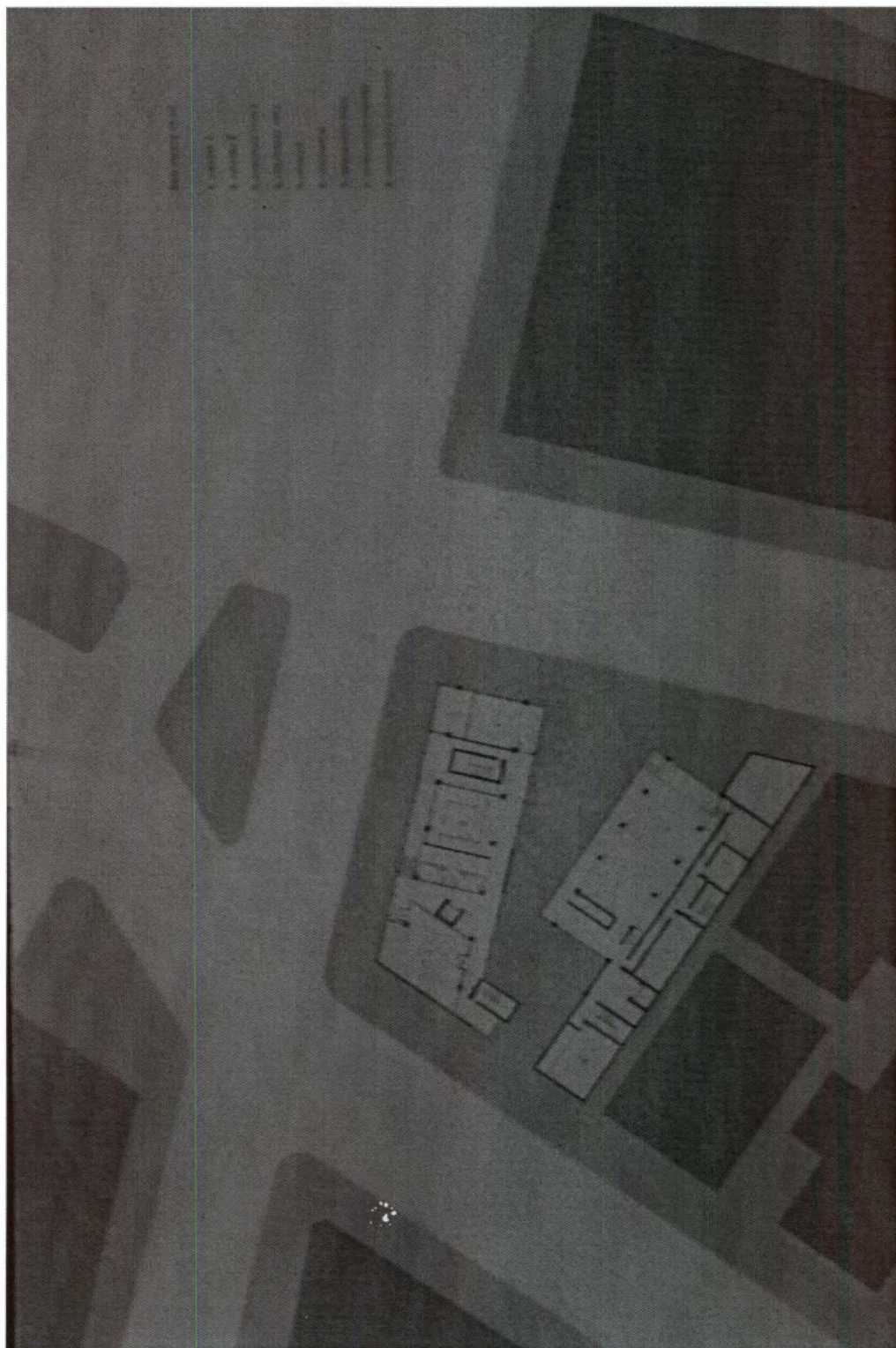


Fig. 107. 3rd floor plan

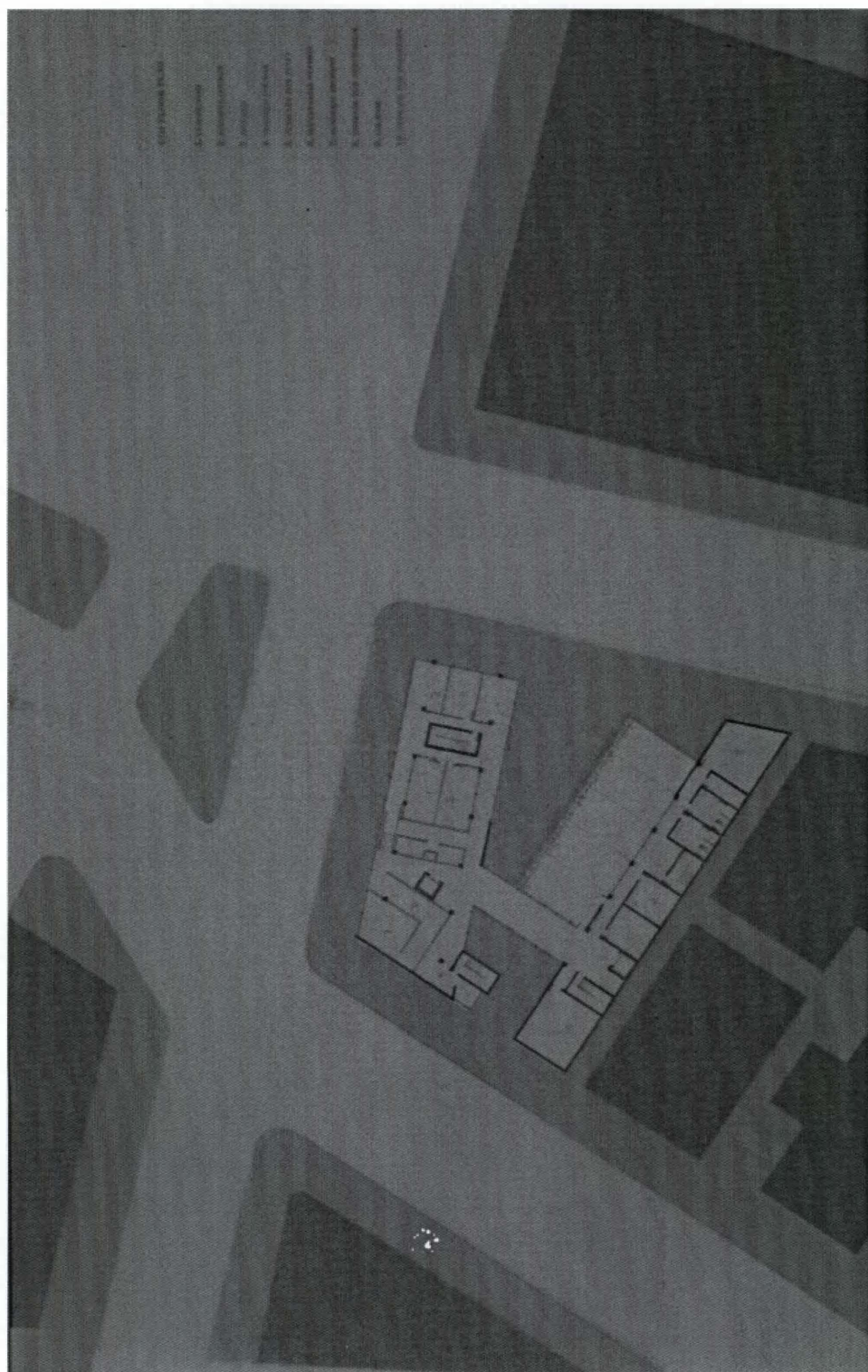


Fig. 108. 4th floor plan



Fig. 109. 5th floor plan

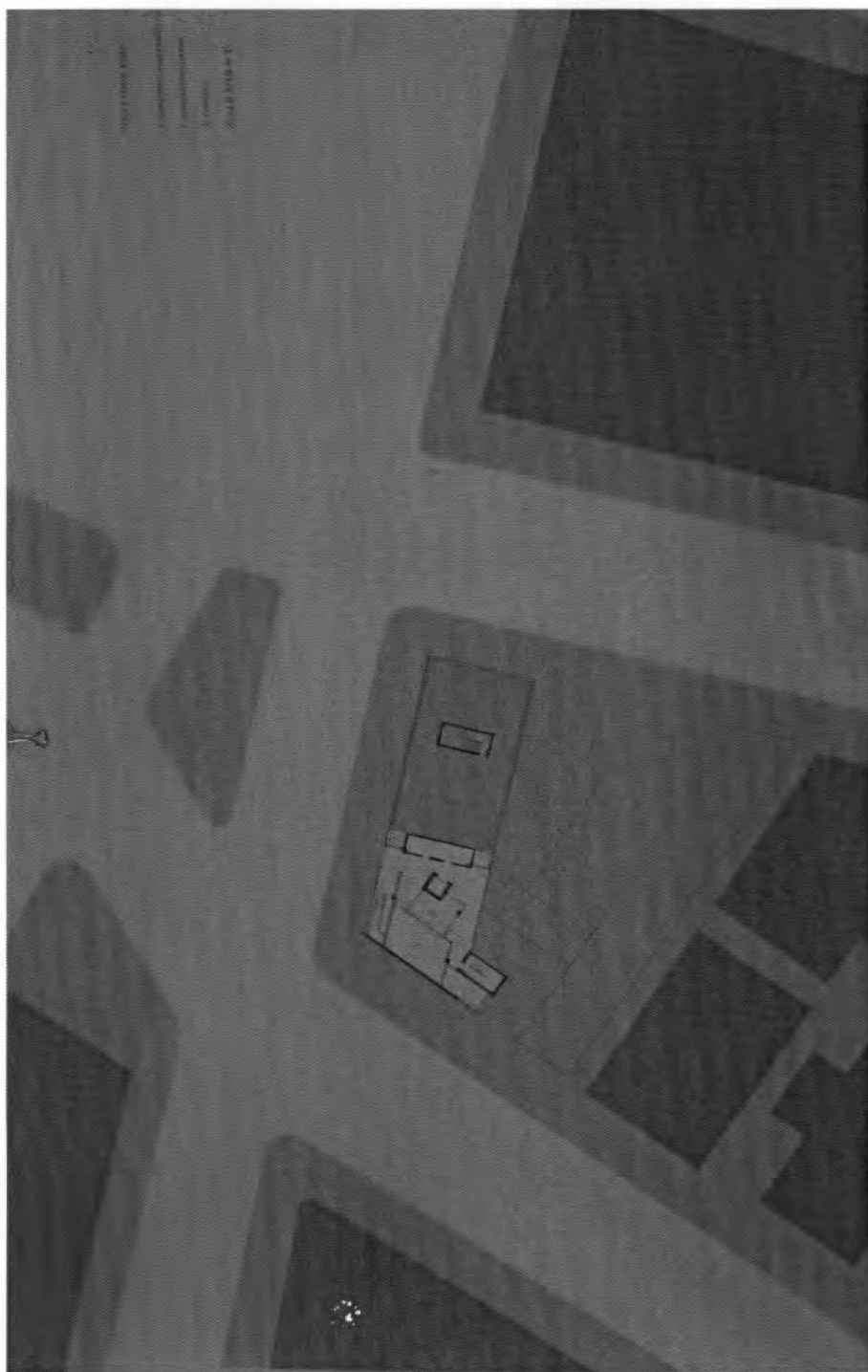


Fig. 110. 6th floor plan

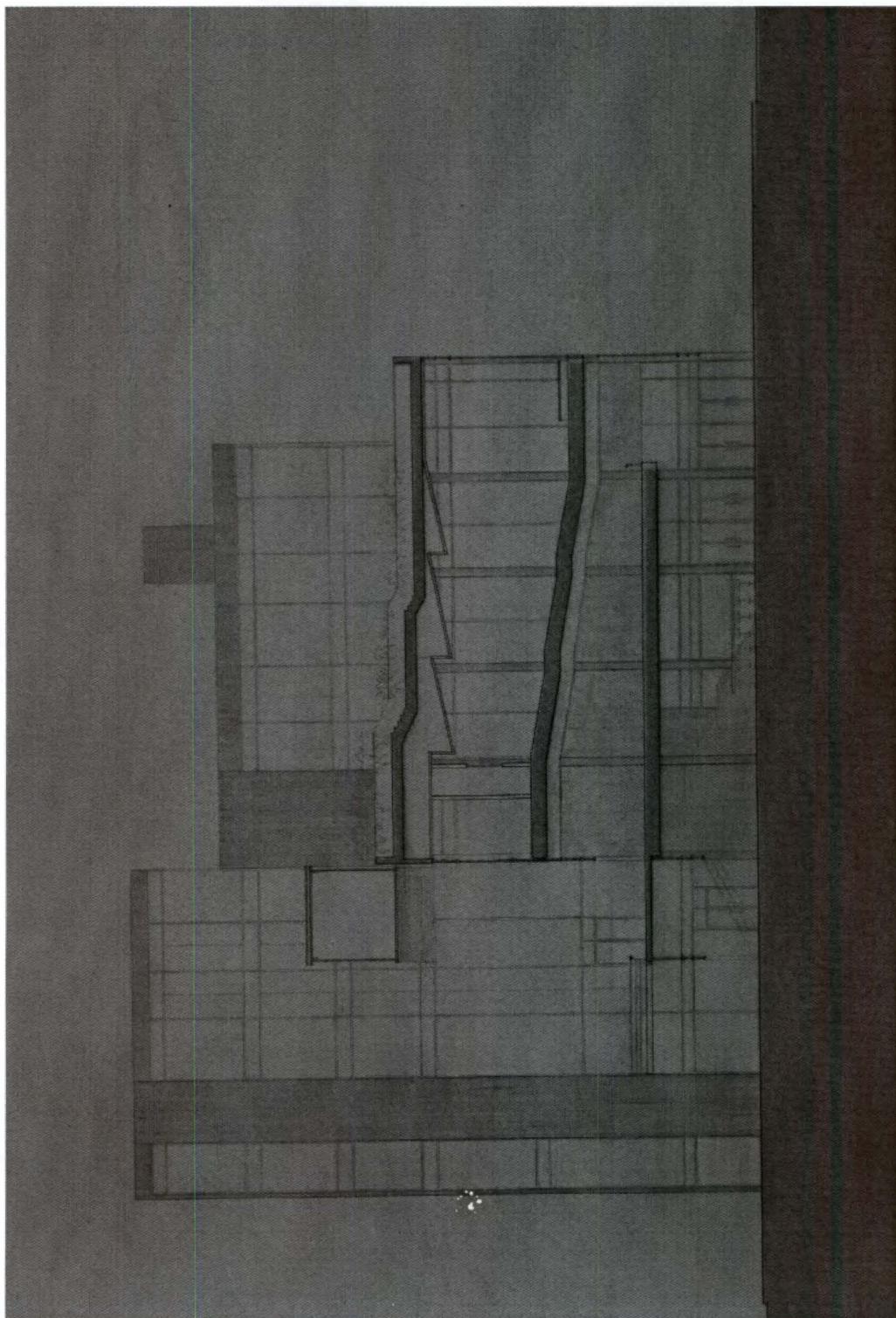


Fig. 111. Section A

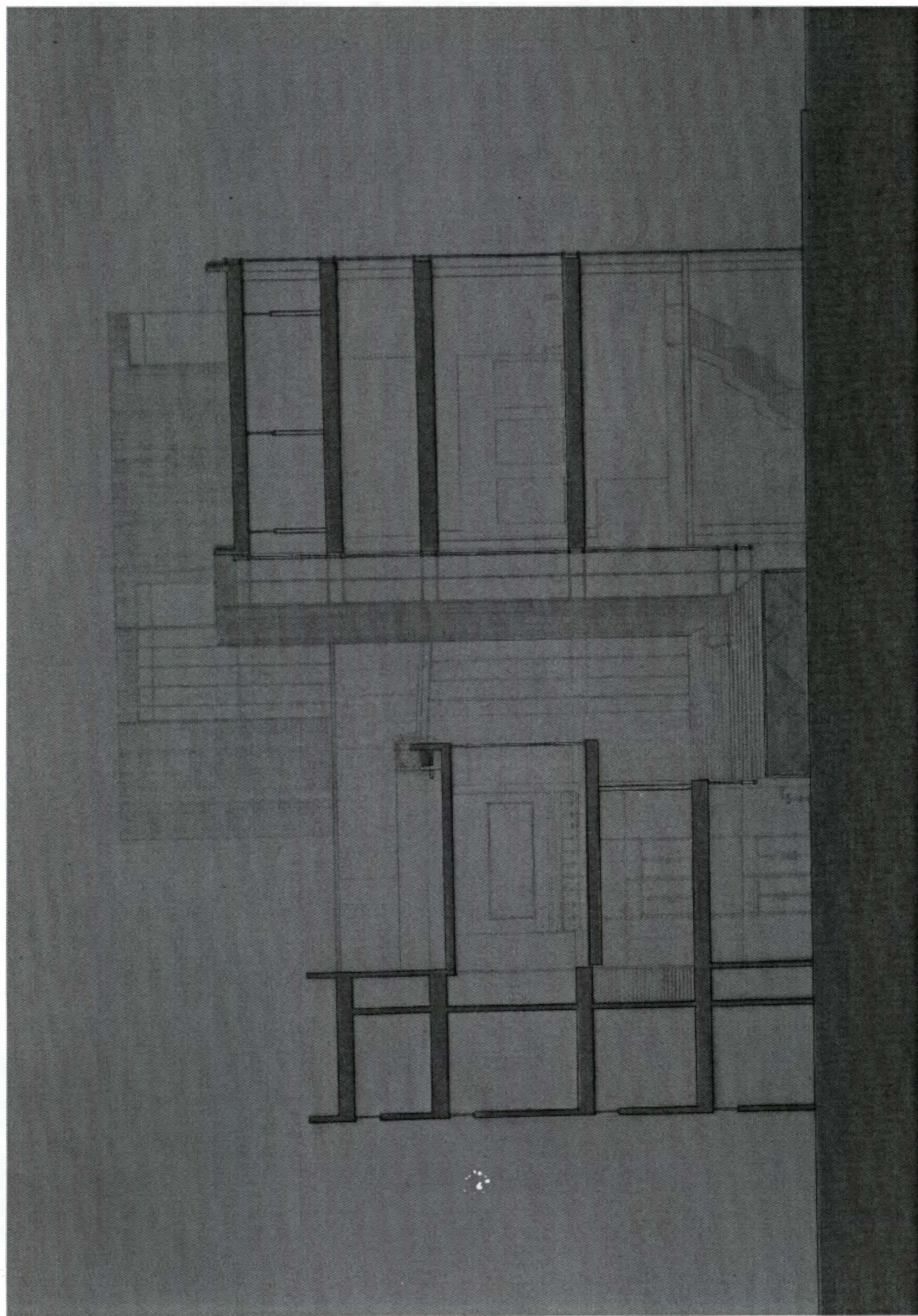


Fig. 112. Section B

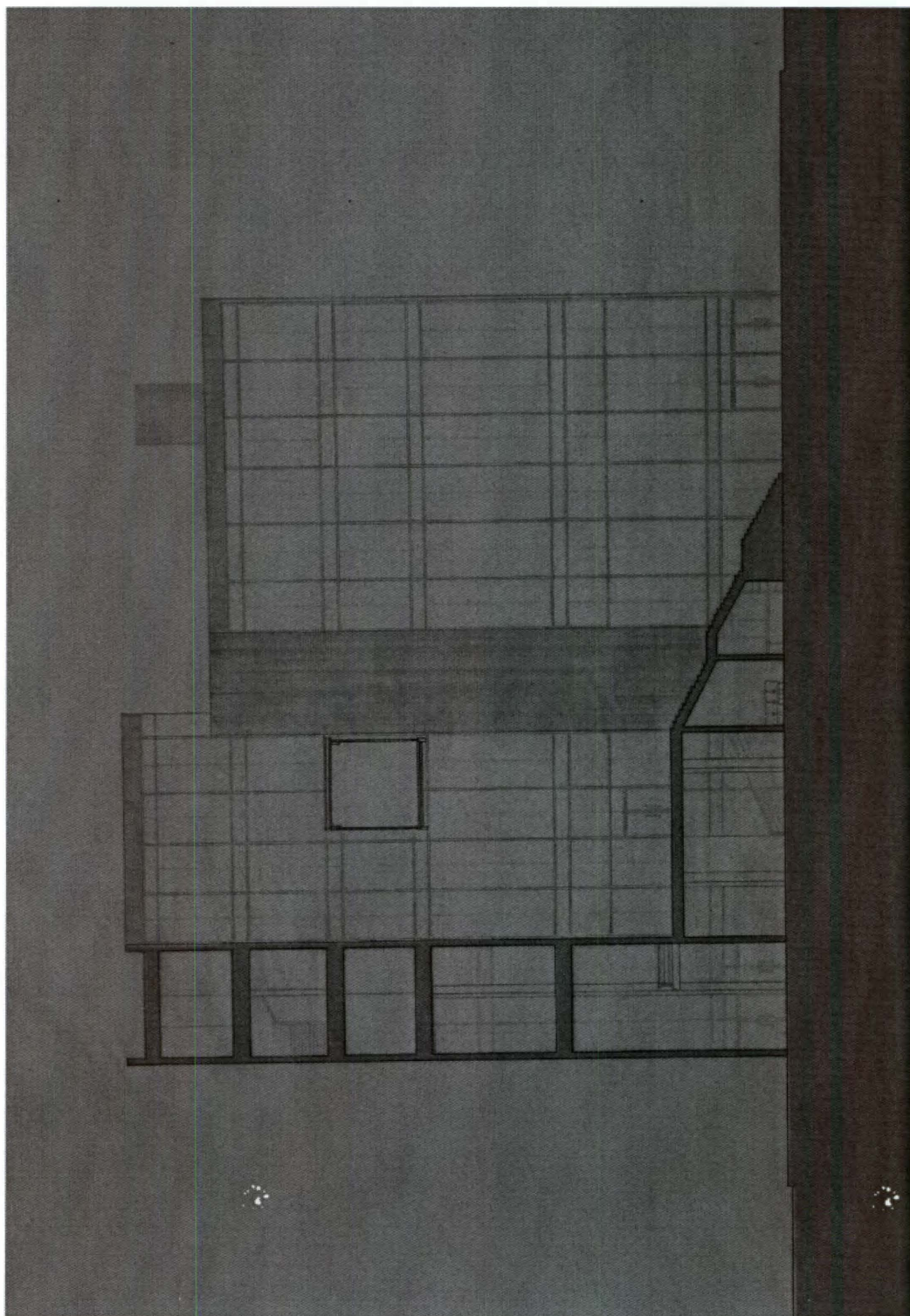


Fig. 113. Section C

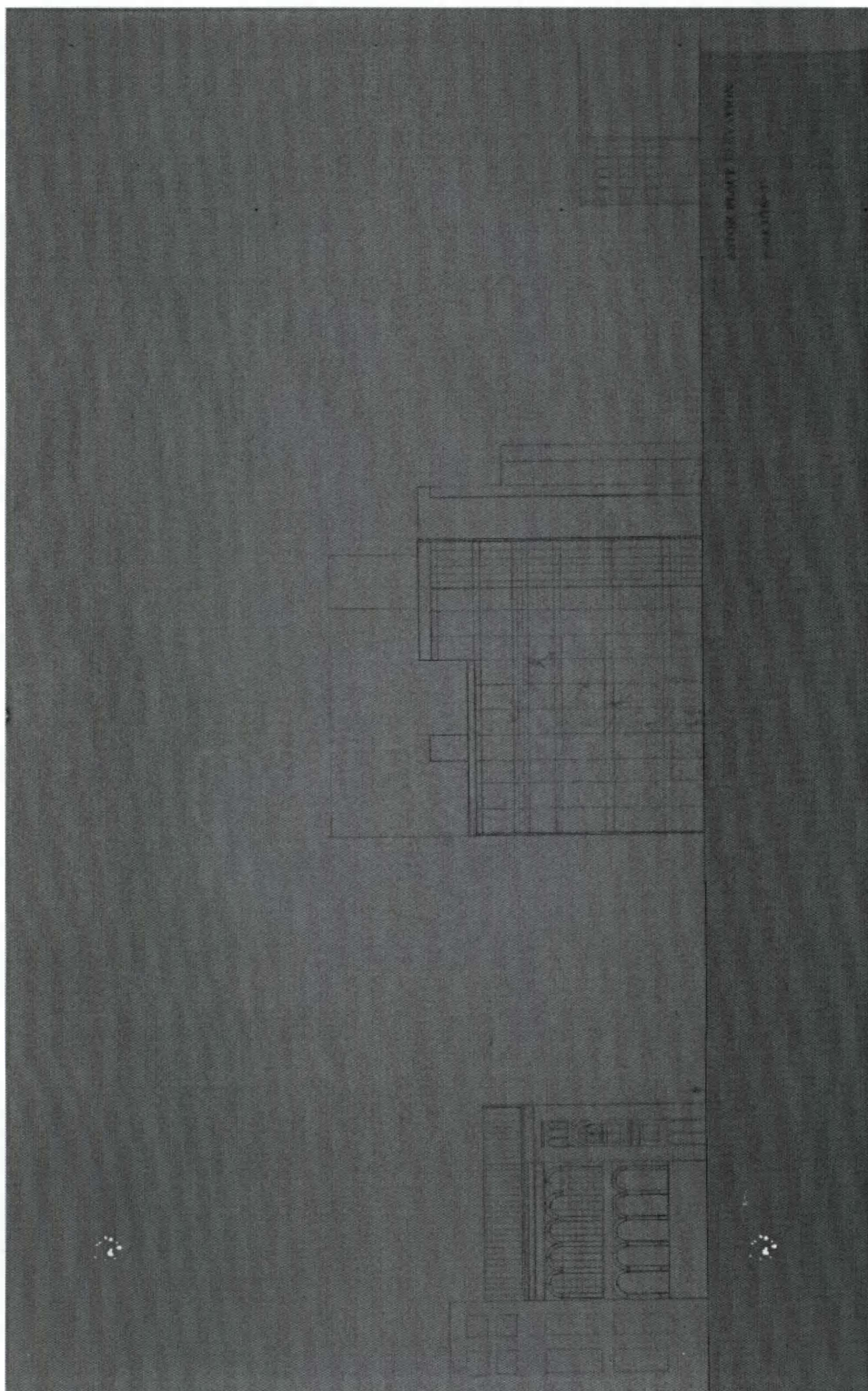


Fig. 114. Astor Place Facade

Vita

Sandra L. Restrepo-Tovar was born in Medellin, Colombia. Raised in Cali, Colombia she completed her Undergraduate studies in Architecture in May 2004 and proceeded to pursue her Graduate Studies graduating from a Master of Architecture in the year 2006.