

Design and Architecture High School
Washington D.C.
By

Jorge L. Bernal

Thesis submitted to the Faculty of the
Virginia Polytechnic Institute and State University

MASTER IN ARCHITECTURE

Approved:

Paul Emmons, Chair

Jaan Holt Marco Frascari Susan Piedmont-Palladino

Thesis defended January 31, 2001
Thesis Book approved October 31, 2001

Alexandria, Virginia

Design and Architecture High School

Education by Design
and the use of Metaphors for Teaching
Architecture in the 21st. Century

Jorge L. Bernal

(ABSTRACT)

This thesis is about learning from architecture, it is about teaching design at an early age, and how light and space speak about architecture. It is about teaching design and architecture at the high school level, and the ideas, metaphors and sources of inspirations used to achieve this.

Design students require a sense of the sublime, the ability to respond to art and architecture, and challenge to aspire to greatness. Schools of design must teach about nature, the metaphysical and the fragility of mankind, moving away from prior schools of thought including "form follows function" and replacing the traditional teaching of architecture with a more inclusive approach. One way to develop thought processes that lead to inclusivity is through the metaphor.

Metaphors are the foundation of the imagination. Strongly developed metaphorical channels are essential to any designer. They offer opportunities to contemplate a proposed work in another light. They inspire the designer to probe new sets of questions and develop new ideas and interpretations. Several metaphors formed the basis of this thesis, "Learning as Light," "A new light every dawn," and "Education by Design," which proposes that twenty-first century design educators rely more greatly on the use of metaphors in their teaching curriculum. Above all, the search for the metaphysical "soul of the building" is and will continue to be the most integral element in the teaching of design and architecture.

Art, architecture and archeology are essential elements to a robust design education, for they provide the context for the history, challenges and changes of the field. This thesis proposes a Design and Architecture High School in downtown Washington, a design developed through careful consideration of the elements essential to the transfer of knowledge.

Acknowledgement

I want to thank Christina Bruce, my wife, for all the hours, days and years of support, while I have been attending Graduate School at Virginia Tech.
Her words of wisdom, enthusiasm and encouragement during some difficult times has not only allowed me to finish the thesis work, but it has made me a more understanding and patient man. I am in her debt.

Contents

Preface	V
Part 1	
1 Ideas for beginnings	2
Part 2	
2 Darkness and Light	5
3 Inclusivity	8
Part 3	
4 The Site	10
5 The Concept Wall1	11
6 Site studies & the	
7 The Courtyard	13
8 Conceptual models	15
Part 4	
9 The School	25
Part 5	
10 References	41
11 Appendices	42
12 Vita	44

Preface

In 1990, I started teaching design as an adjunct Faculty at a new high school of design in Miami, Florida. (See appendix) The experiences were many and the opportunity to teach and to learn about teaching design became a passion. After five years of teaching several design courses at different grade levels, the school principal offered me not only the opportunity to teach full time, but more importantly to be the design coordinator for the school's program. This became a new challenge. By then the adjunct faculty consisted of 22 design professionals from the community. They were architects, interior designers, industrial designers and landscape architects. Some of my responsibilities included performing reviews and faculty teaching skill assessments, planning field trips, and developing an Architects Lecture series.

Three years ago I arrived at WAAC/Virginia Tech interested in pursuing some of these teaching methods, style, and acquiring a better understanding of the dialogue between teacher and student. I was searching for a better way of communicating design ideas to students, faculty and administrators alike.

Education is about learning. Art, architecture and archeology must be understood, for they provide the context for history, changes, challenges and the sense of life. We must teach the contemplation of nature, its sensitivity and the fragility of the human institution. An understanding of nature and the metaphorical will give students a sense of the sublime, have them "aspire to greatness," open a window of opportunity. Art and architecture and the ability to respond to them are one of the greatest things we can have and teach!

This journey brought tremendous challenges. I came equipped only with my own life experiences and ways of doing things. For me this has been a quest to learn how to speak about architecture, but more importantly, how architecture speaks to us.

Education by Design

Introduction

If the premise, "Architecture is taught by architects" is true, then it would be fundamentally correct to say architecture is first taught by light and space, specifically nature and or man-made space. The way we respond is colored by many things: the part of the world we live in, the climate, the seasons, etc.

Our response, our dialogue with space, is demonstrated physically in our behavior and mentally in our attitude. We develop customs and traditions: what we eat, how we dress, what we build.

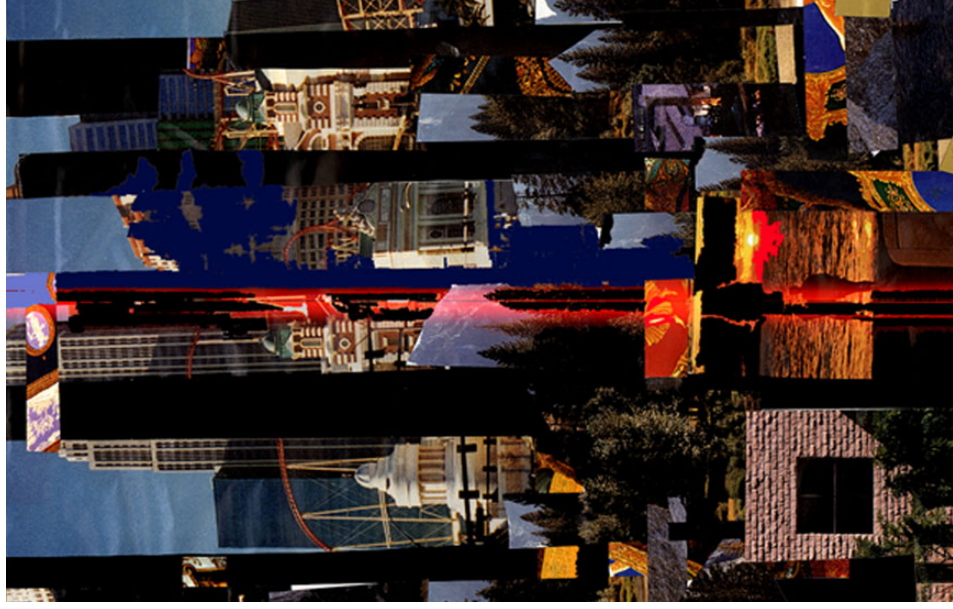
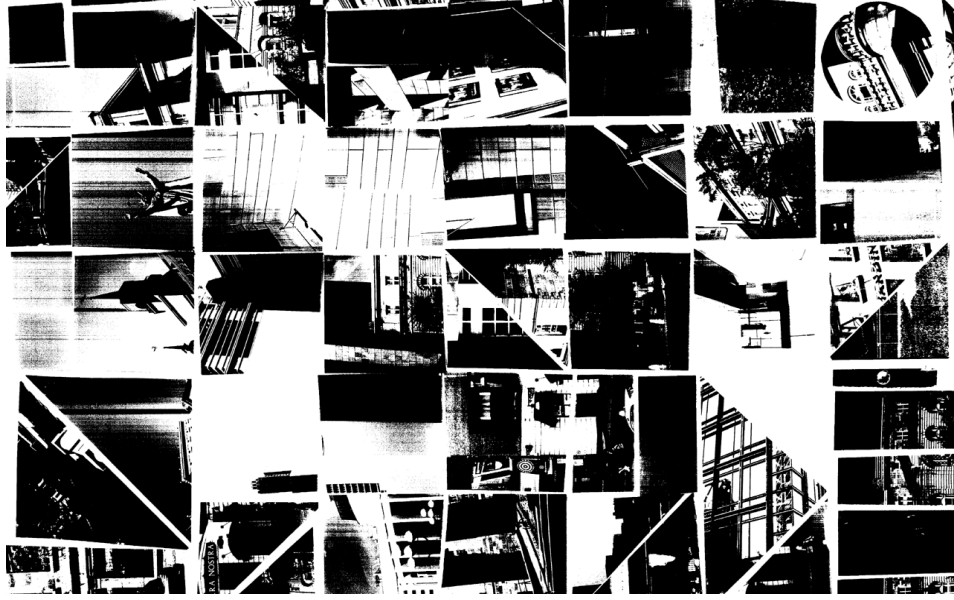
Light and Space speaks to us through the basic design elements: proportion, shape, scale, size, texture, color and light with all its variations and intensity. Light and shadows in space open a dialogue in architecture.

Materials send messages about the elements of texture, the finishes, quality, richness, weakness or strength and permanence of architecture.

Space communicates, it establishes a mood, a relationship.

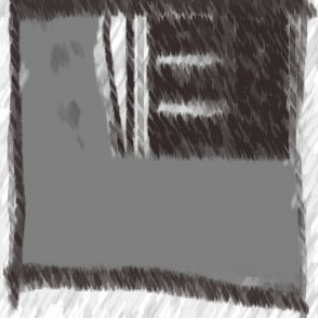
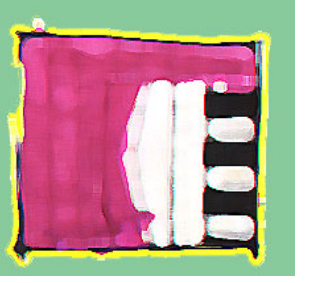
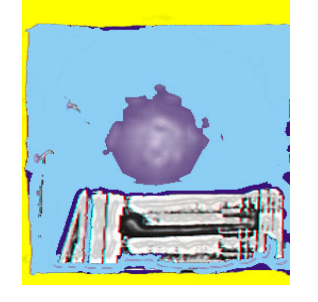
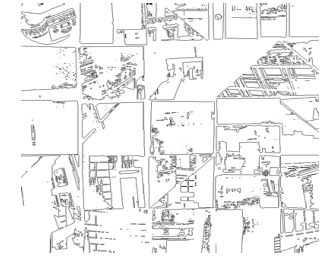
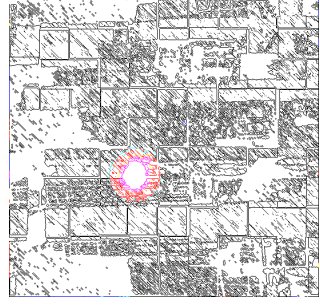
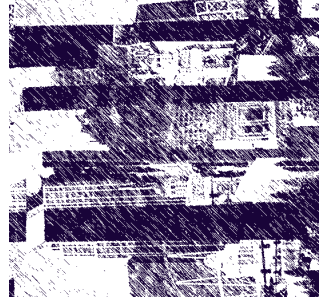
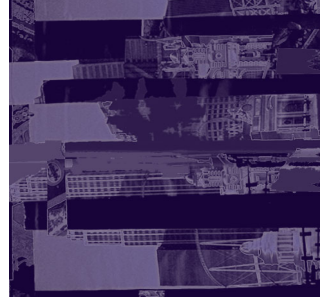
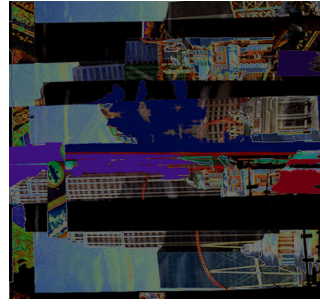
Architecture speaks...

Ideas for beginnings



A thesis is not a building.

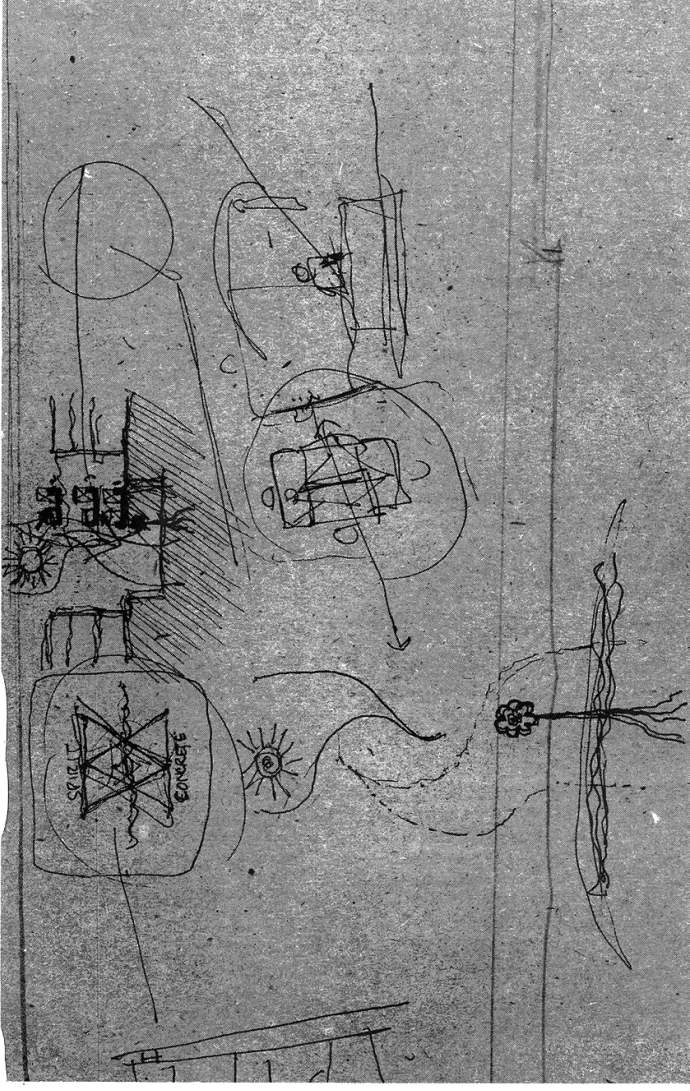
Fragments, Images, Collages, Windows to our Imagination



The images and the collages are juxtaposed for various changing effects. They challenge or echo each other, to support or oppose one another. The 12 contrasts and respective boundaries may vary from soft to hard, may pull and push besides clash, but also embrace intersect, penetrate.

The Soul of the Building

Understanding the dialogue of man with architecture.

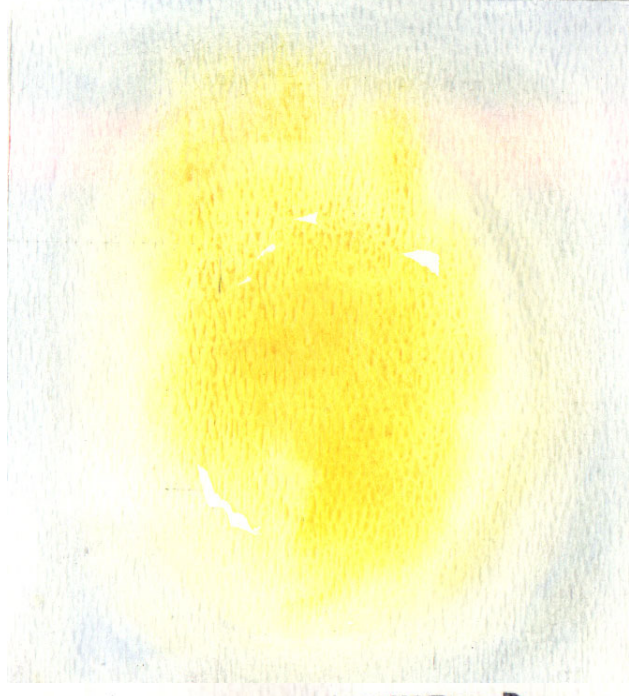


Metaphysical: pertaining to or of nature of metaphysics. Concerned with abstract thought of existence, causality or truth. Concerned with first principles and ultimate grounds, as being time, or substance. Highly abstract, subtle, or philosophical; features intensive use of ingenious concerns and turns of wit.
Webster's New World Dictionary

Darkness and Light

Light was celebrated, worshipped and prayed for in most early human cultures, and continues to be.

"Light and inspiration make learning possible"

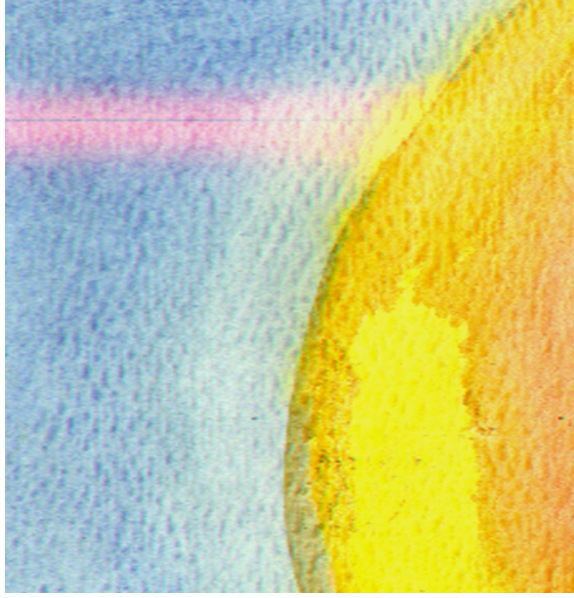


"Glimmering lights are intimations of latent worlds, giving hope and inspiration to what may be our most fundamental need – a cosmic foothold in a dark void".

Henry Plummer
Poetics of Light Architecture and Urbanism (1987)

Light forges a spatial continuum, opening our environment to visual penetration and extending our reach to the distant stars. Coming out into the light is synonymous with truth and doing the right thing.

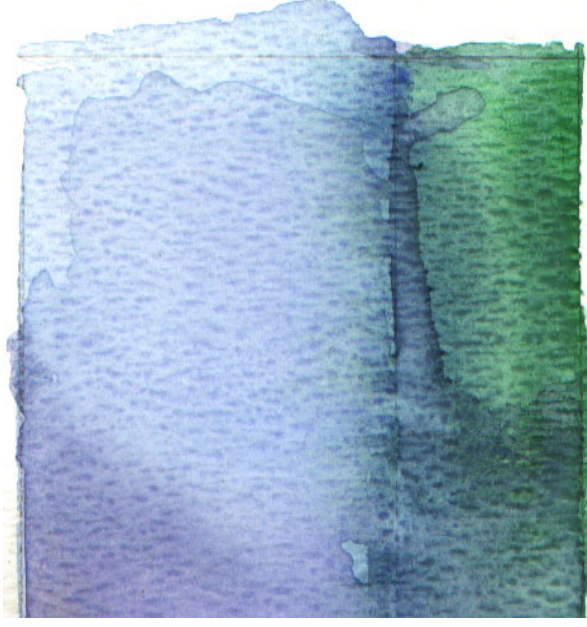
Quest for the light



"Each dawning sky, evokes the golden vision of a distant yet felicitous cosmos, a realm of space that has opened to our arrival"

Plummer Poetics of Light Architecture and Urbanism (1987)
Henry

Luminous matter



A light-animated space is never susceptible to objective measurement or observation, for not only does it withhold some of its contents, but it incorporates the viewer directly into the work, provoking readings and dreams, inciting one's powers of imagination, attracting a person's attention and movement.

City of Light



"Light eradicates mysteries and uncertainties, it concentrates evocative oppositions of light and darkness, day and night, bringing space alive with optical adventures."

Henry Plummer
Poetics of Light Architecture and Urbanism (1987)

Shadows



Shadowy things not only give access to hidden dimensions and features of our human nature, but they also give us uncharted space.

The need for inclusivity.

Inclusivity means the attitude of exploring ideas and the "making" of a work through many more points of view. The functional, formal, spiritual, historical, traditional or contemporary considerations of the past now seem one-sided, Architectural inclusivity is the making of architecture through the process in which the poetic argument addresses a greater range of potential constants, while at the same time operating on totally non doctrinaire grounds while giving the benefits of the doubt to and exploring the advantages and disadvantages of the various possibilities and aesthetics.

The more complex, diverse, and sophisticated a society is, the more complex the task of the inclusivist architect.

Anthony C. Antoniades



Space

" The structure is design in light. The vault, the dome, the arch, the column are structures related to the character of light- natural light gives mood to space by the nuances of light in the time of day and the seasons of the year, as it enters and modifies space.

Greek Architecture taught me that the column is when the light is not, and space between is, when the lights is. It is matter of no – light, light, no- light."

Kahn

Louis



Form

"Do not be intimidated by the puritanically moral language of orthodox modern architecture... I like elements which are hybrid rather than pure, compromising rather than clean, distorted rather than straight forward, ambiguous rather than articulated, perverse rather than impersonal."

Complexity & Contradiction in Architecture.

Venturi

Robert



Colors

"I'm interested in expressing only basic human emotions- tragedy, ecstasy, doom, and so on- and the fact that lots of people break down and cry when confronted with my pictures shows that I communicate these basic human emotions...."

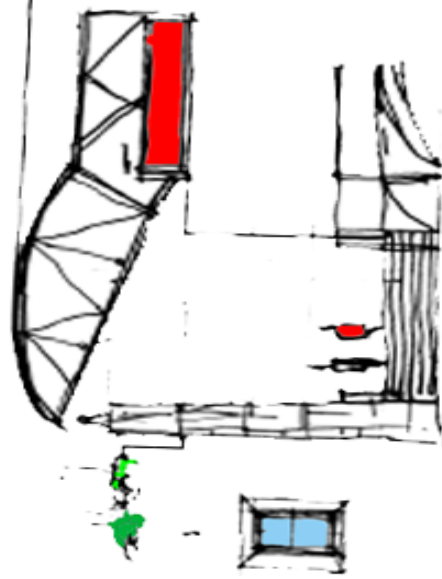
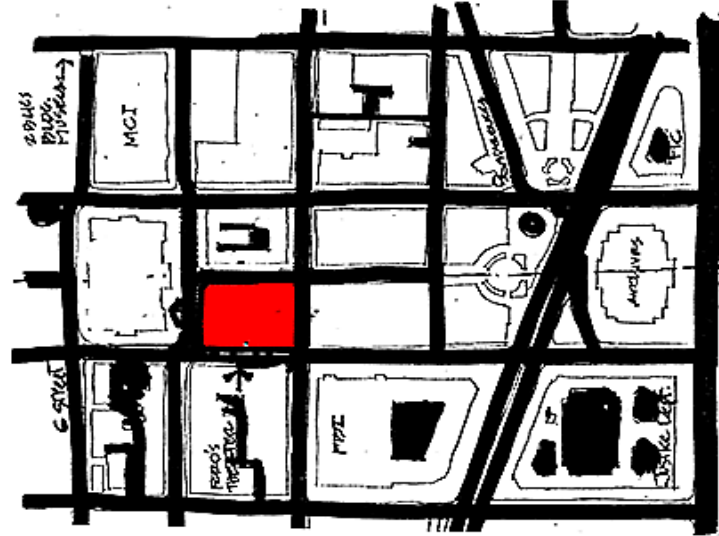
Mark Rothko,

Site & Location Plan

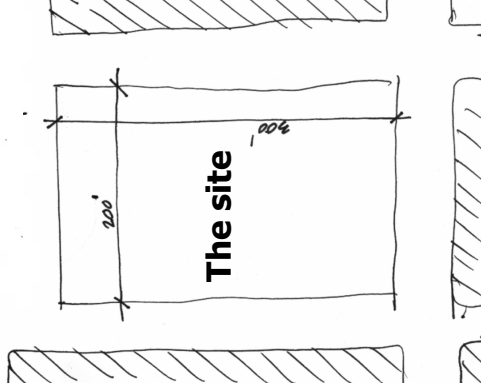
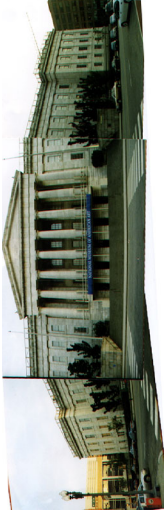
Site considerations:

Orientation, topography, services, macroclimate, microclimate, adjacent buildings, vehicular access, metro, buses, parking, program, form, circulation, structure, enclosure, construction type, construction process, energy, image and

North



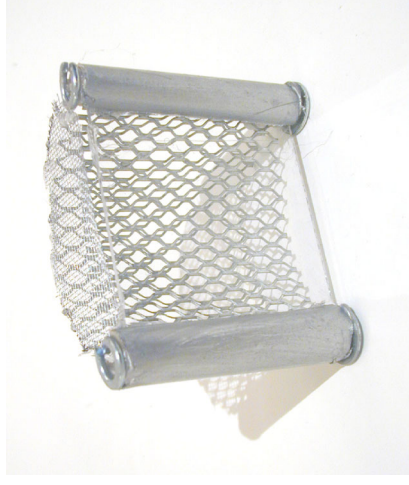
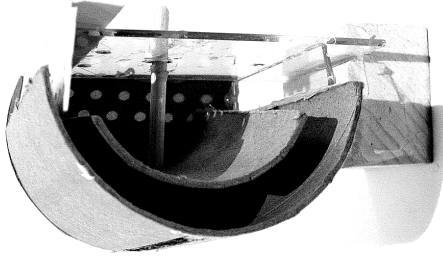
Entering a building or a defined field of exterior space, involves the act of penetrating a vertical plane that distinguishes one space from another, and separates "here" from "there." A threshold is crossed.



The site is a rectangular city block, oriented N/S 200' x 300', located between 8th. & 9th Streets and between E & F Streets, N.W., two blocks north of Pennsylvania Avenue and The Mall, Washington D.C. The site topography has a 22' elevation difference between the N.E. corner and the S.W. corner.

Adjacent buildings are to the east, a historical building and a future Postal Service office, to the north, The National Portrait Gallery, to the west, a hotel and a combination office and apartment building, to the south east, The FBI Building, to the south an office building and to the south west a commercial and office building.

The Wall

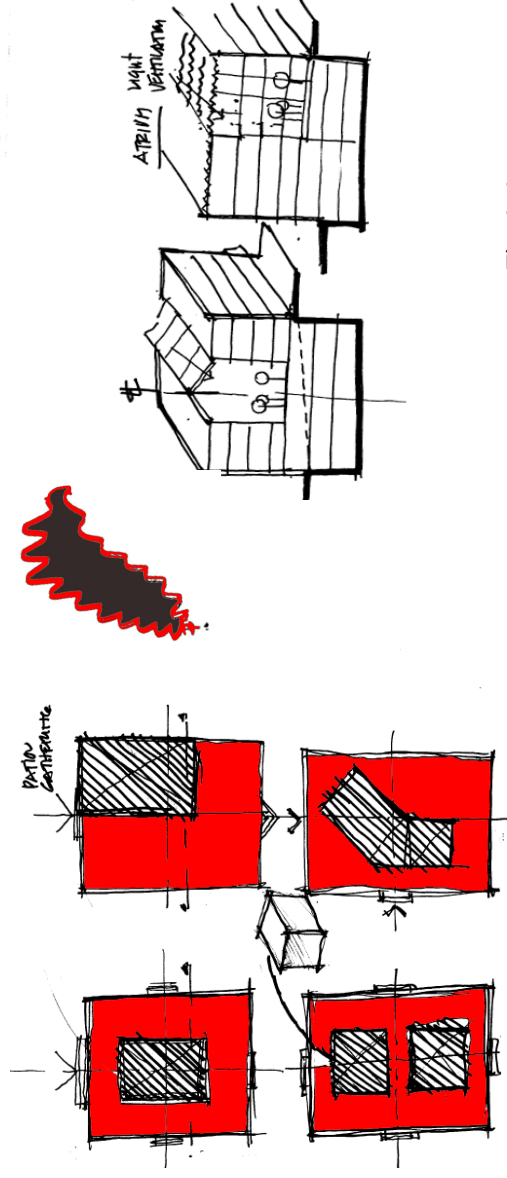
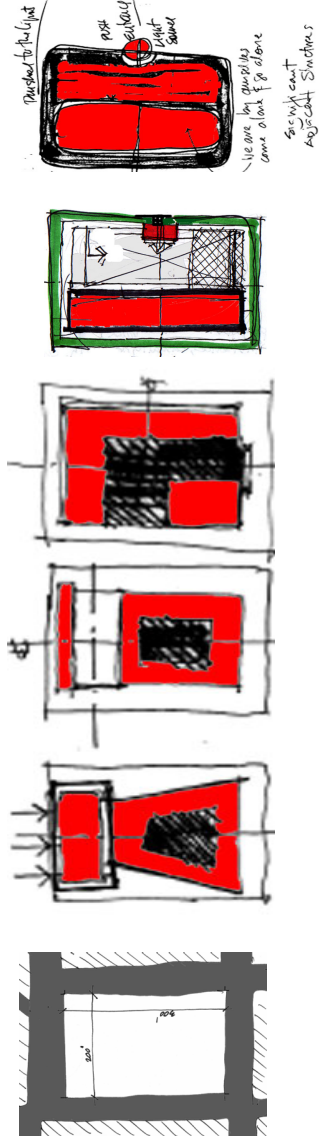


The sun rises from the east, and then the force of light attempts to penetrate and / or manipulate the space. If the structure gives way and allows it, the space will grow. In education, if learning is received in fertile ground it will grow as well. It will give direction and meaning.

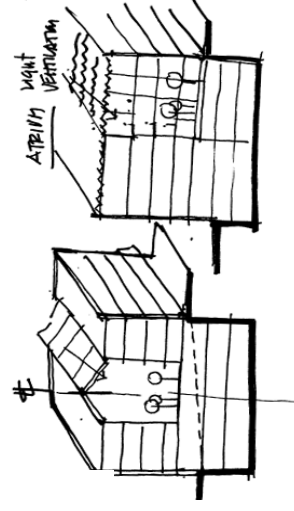
Site studies and development of the courtyard

The Approach:

Prior to entering a building's interior we approach its entrance along a path. This path is the preparation to see and experience the building spaces. The considerations are many: anticipation, the threshold, transition, procession, event, destination, the edges, the boundaries, the path itself, and the cosmology.



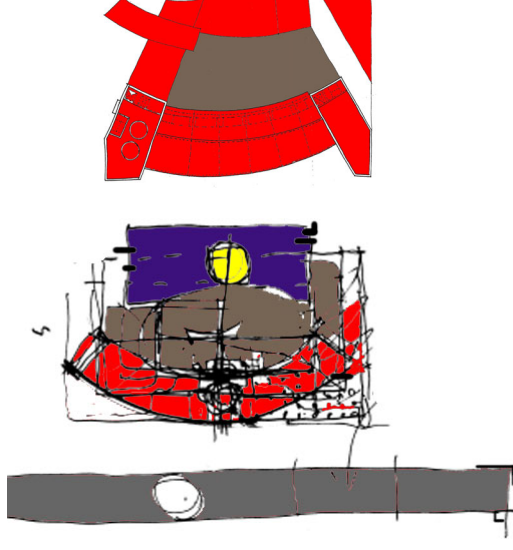
The negative space



The Atrium

City, Light, Education, School

Core space and courtyard



The degree to which architectural expression is capable of being meaningful is the degree to which it is capable of promoting transcendence.

Because the poetic form employs compositional strategies to achieve effects outside the conventions of the prosaic, it possesses extraordinary sensual (formal and rhythmic) and connotative capacities.

To pursue the poetic in architecture, we must cultivate our eyes to see things, train our hands to explore things and prepare our minds to discover things not everyone will.

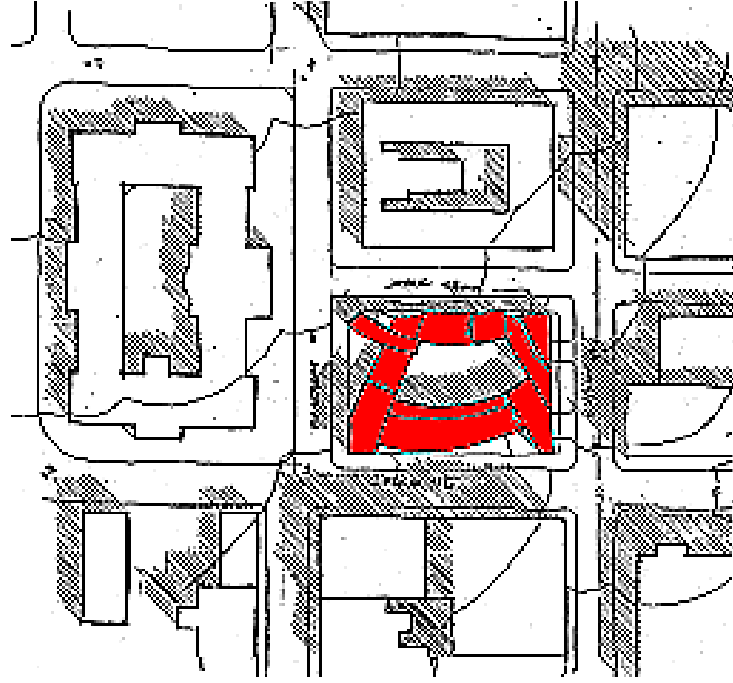
To elicit such qualities in buildings should be a basic professional responsibility, not a secondary possibility.

"There is no such thing as architecture, there is the spirit of architecture, but it has no presence.

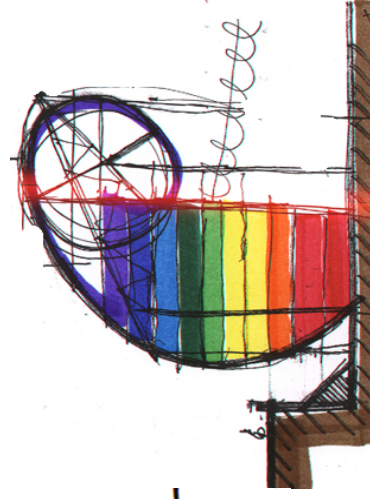
What does have presence is a work of architecture, at best it must be considered as an offering to architecture itself, merely because the wonder of its beginning."

Louis Kahn

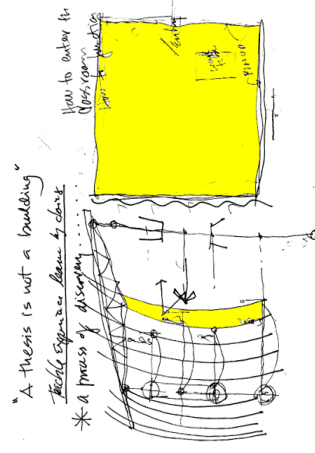
Site, Location, Surroundings



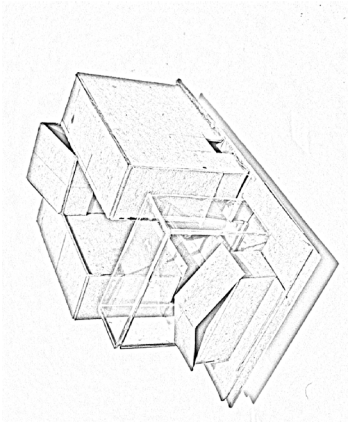
North



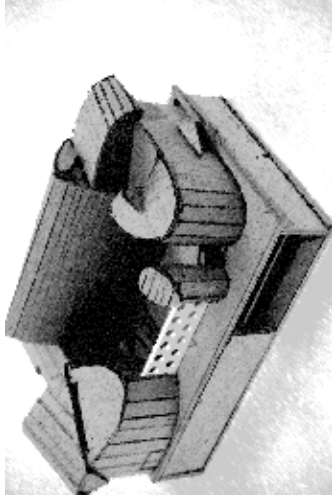
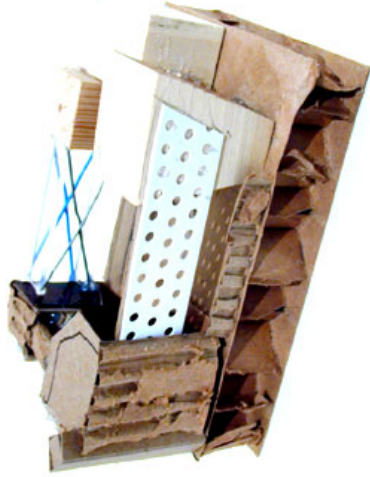
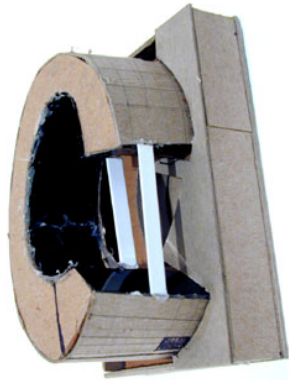
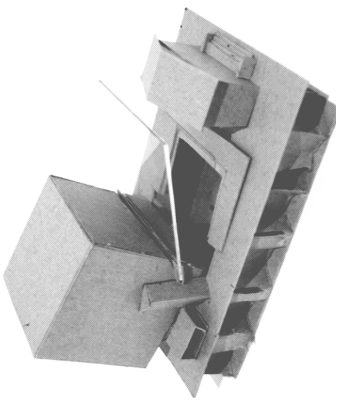
Concept, Color, Section



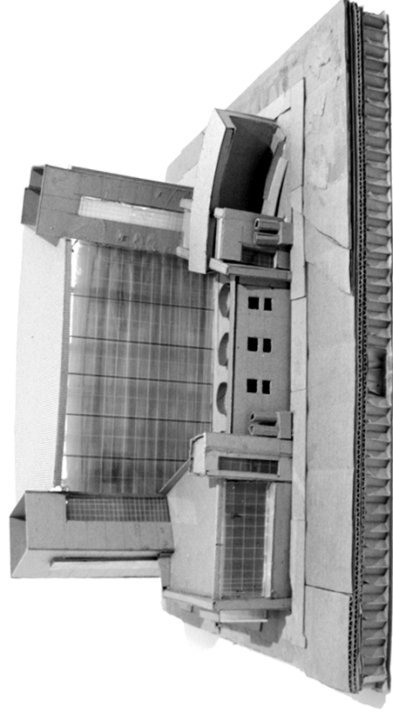
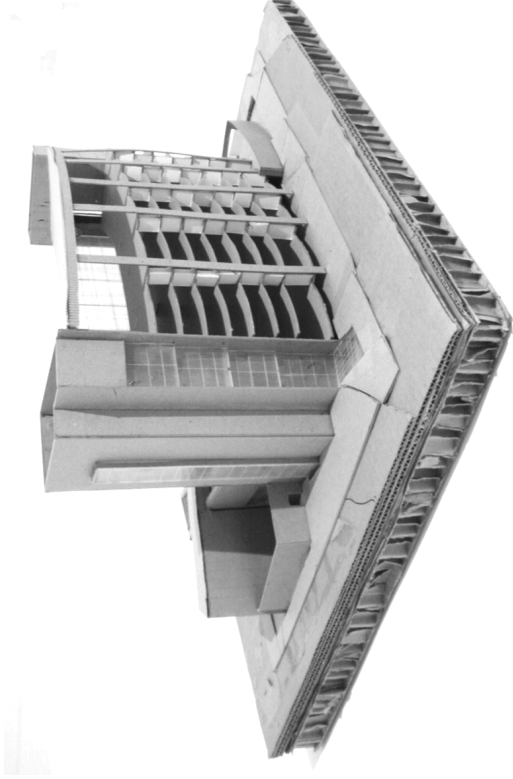
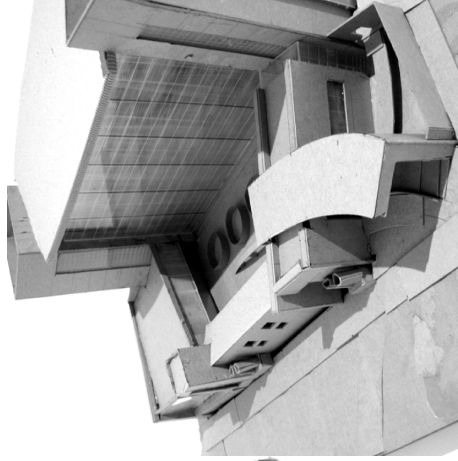
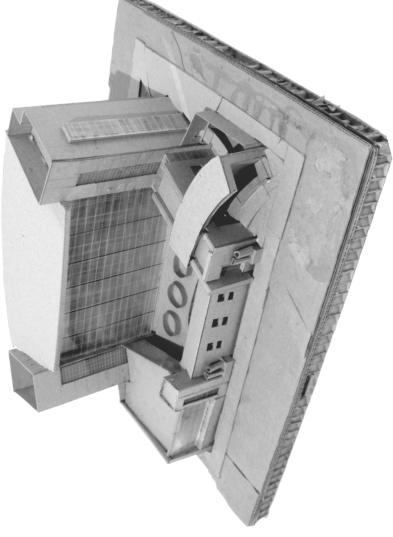
Light Source



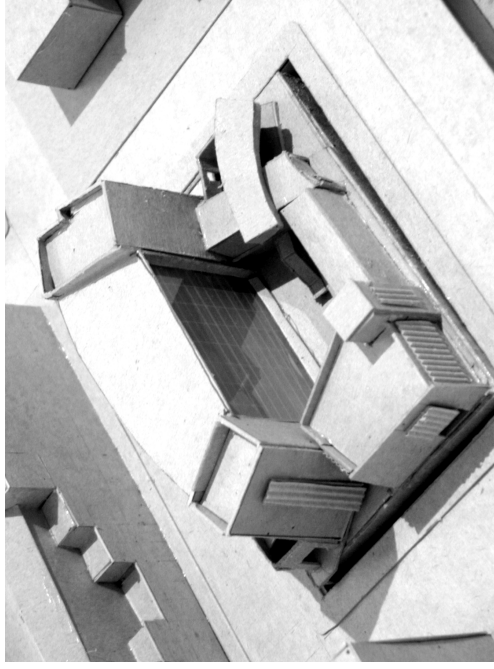
Early Conceptual Models



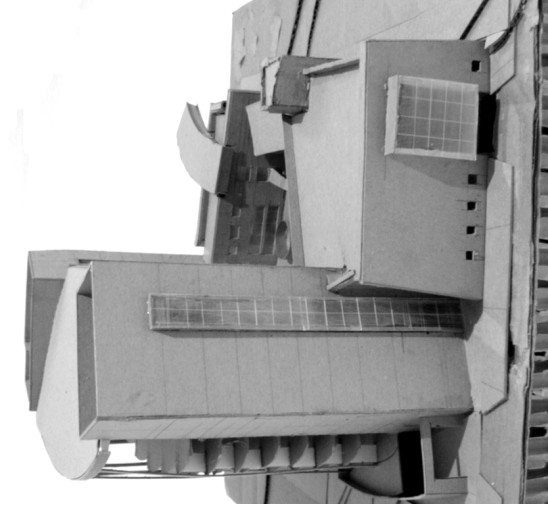
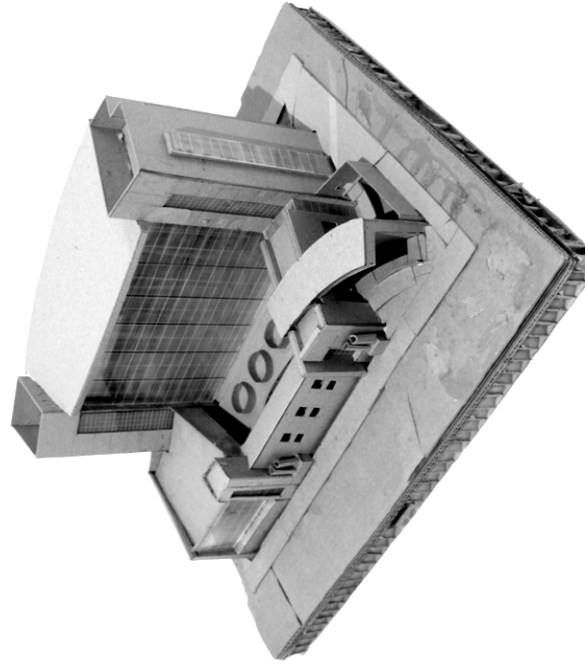
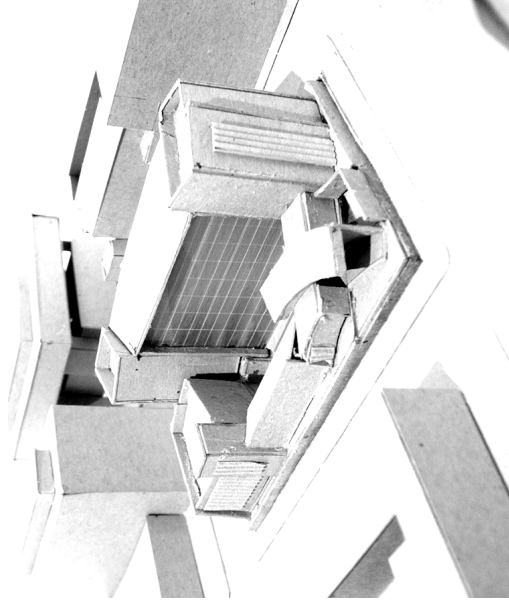
Study Models



Site Study Models

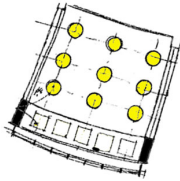


Site Models

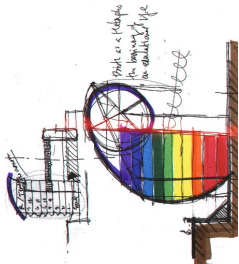


The Classroom

When light passes through a prism it creates colors.



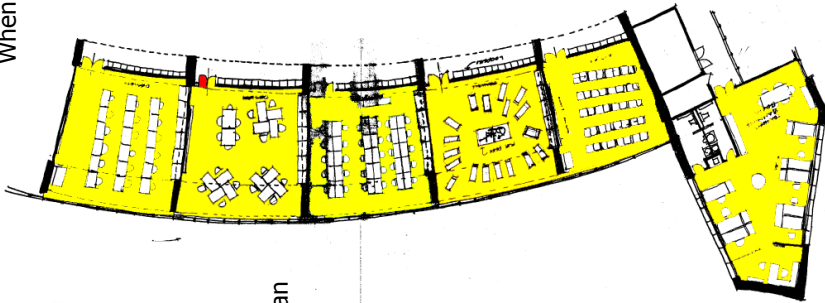
Reflected ceiling plan



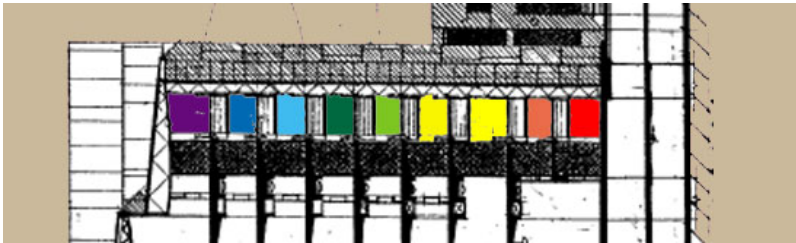
Hallways have accent colors following the rainbow color spectrum . The cooler colors on the higher floors. Students on top have the cooler colors.

There are five classroom sizes, and they all have natural light. Each classroom has lockers directly outside the door.

The Teachers offices and lounge are located on the south west corner. This space is accessed via a bridge and atrium on the south tower. Natural light frames this corner.

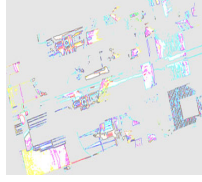
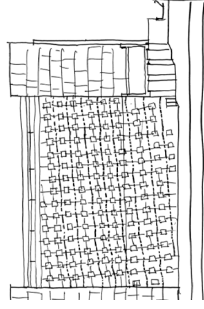
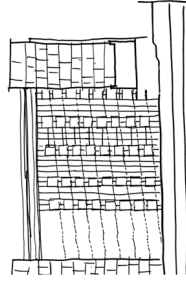
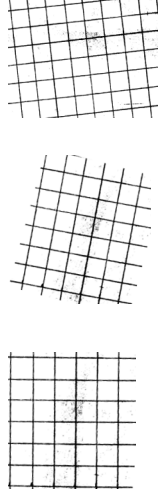


Partial Floor Plan

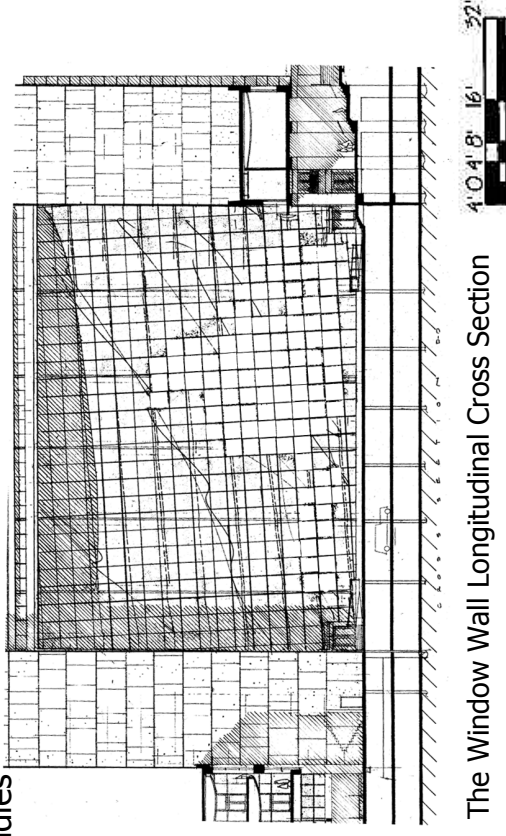


The Hallway Colors

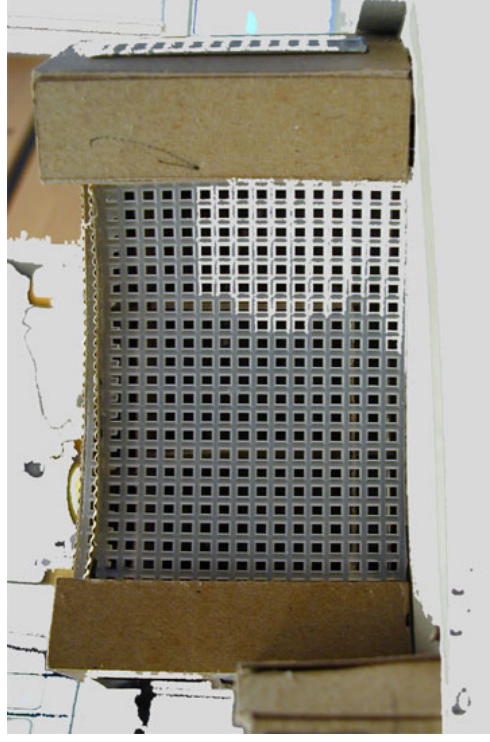
The Light, The Window Wall Studies



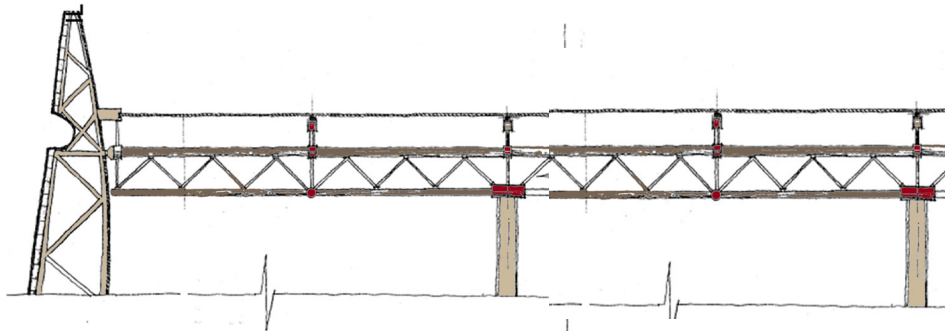
The window reflections with angles denotes action and direction. An added building dynamic is the ramp behind the glass wall, and the students' movement on the circulation ramp.



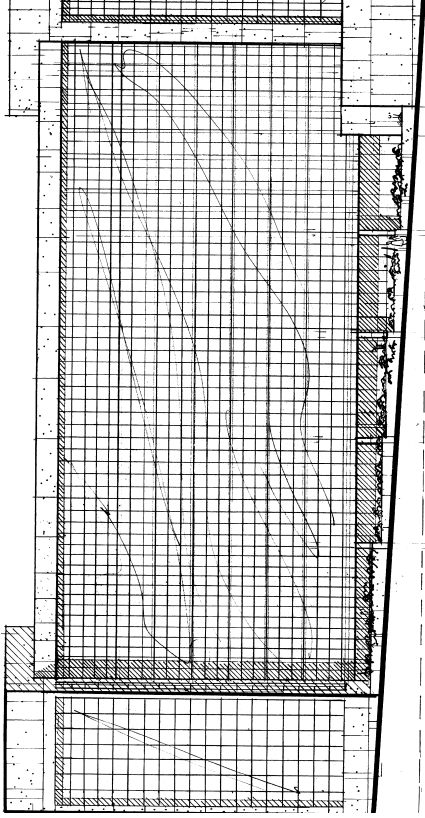
The Window Wall Longitudinal Cross Section



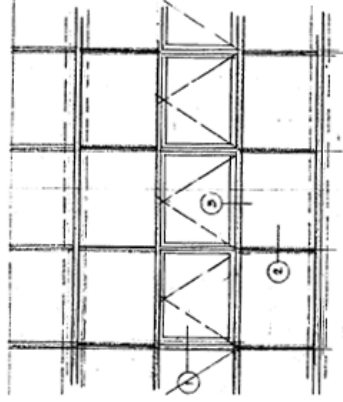
The Window Wall model



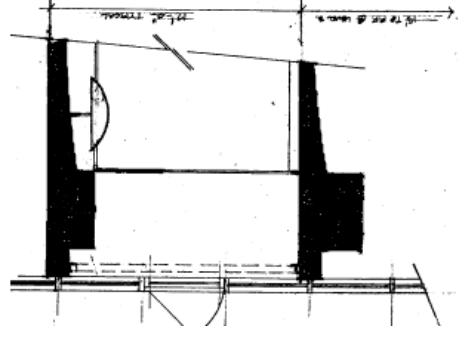
Glass Wall Section



Partial Elevation West Side



Wall Sections & Window details



Light and its effects

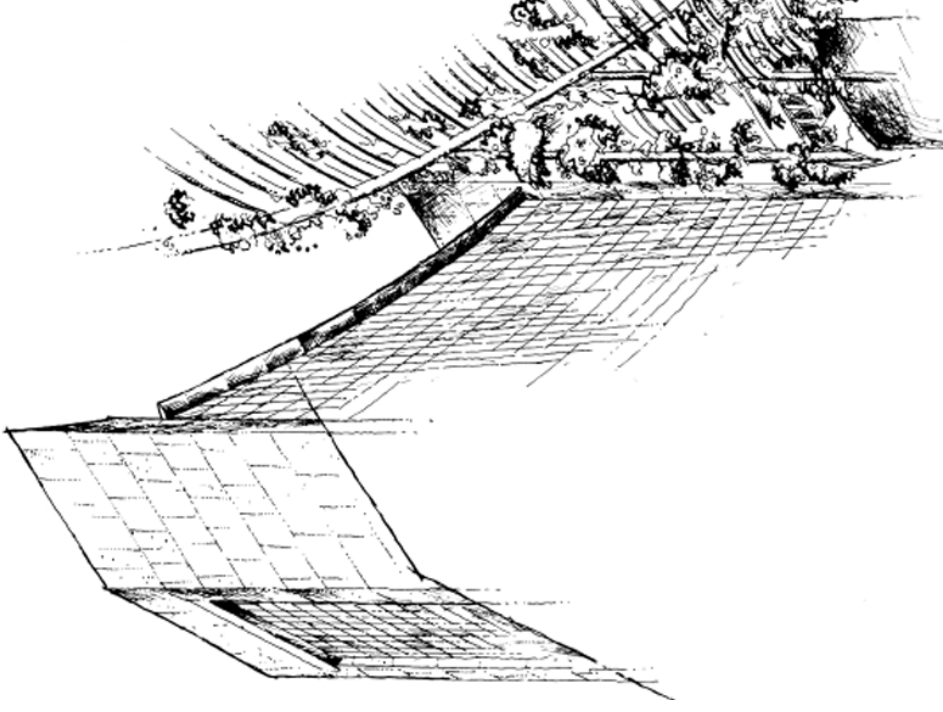
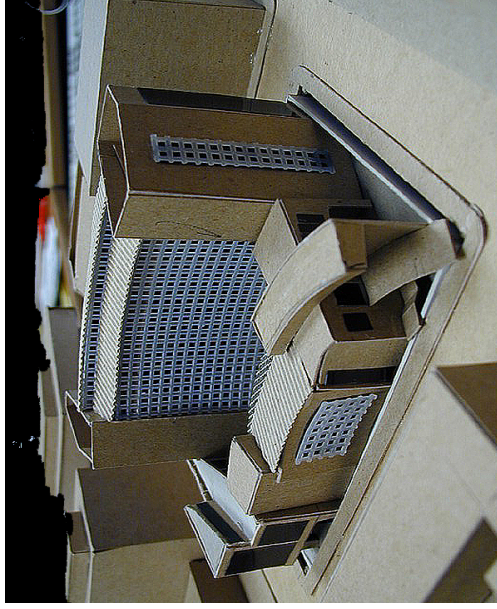
The are two English words, "affect" and "effect," which sound alike but mean quite different things. Effect is something produced by an agent or cause. In architecture it is the relationship between some object and its function or meaning. It is an idea dominating western architecture for the last two hundred years.

Since the French revolution, architecture, in its political, social and economical sense has dealt with effect! It is good to be effective. If it is good, it serves more people. The clearest example of effect is the utilitarian creed of modern architecture: Form follows function. This argued that socially viable programs, properly elaborated would provide good architecture.

Affect on the other hand, has nothing necessarily to do with good. Affect is the conscious subjective aspect of emotion considered apart from bodily changes.

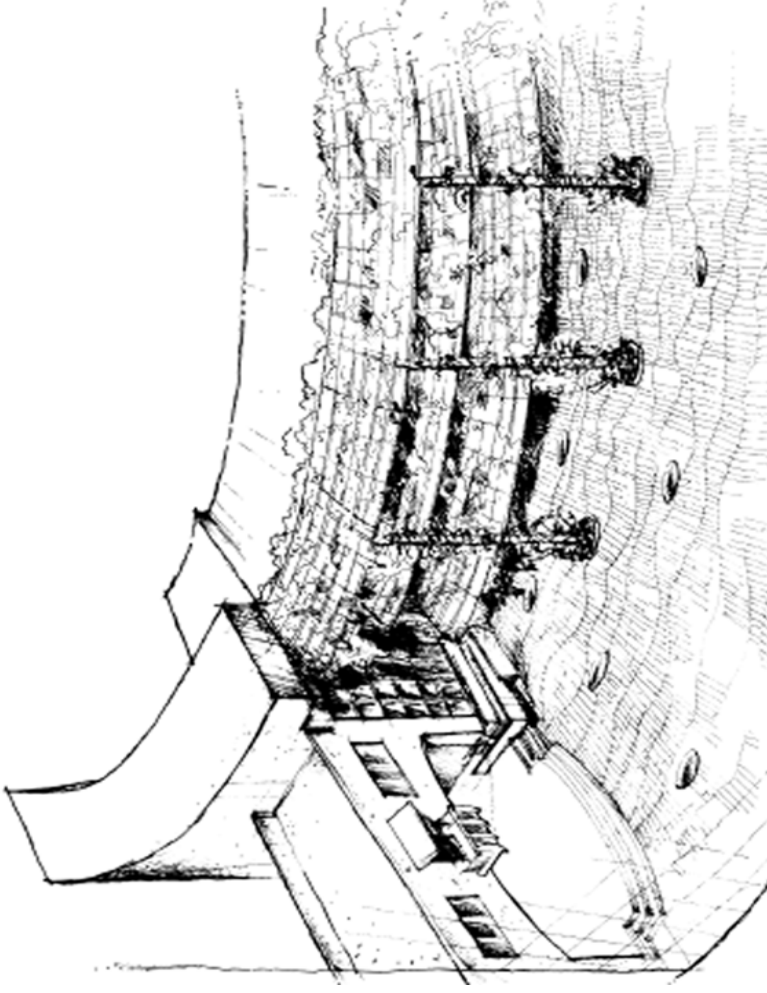
Affect in architecture is simply the sensate response to physical environment.

Peter Eiseman



East glass wall from the courtyard

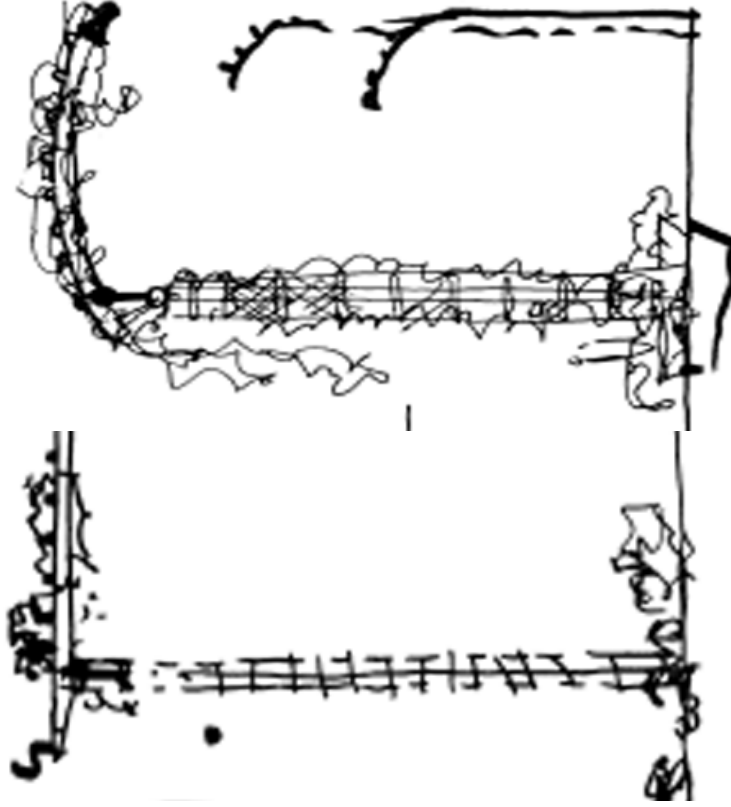
The Courtyard



The Courtyard is the heart of the school, a place to meet friends and socialize, a focal point for fun and play, a patio and garden that bring light and color to the innermost part of the building. At the central place, students can see the school, they can see their friends and be seen. It is the area that separates faculty and students from the administration. The area has no ceiling; the sky is the limit. It is also where graduation occurs, a formal and important moment. On the north side of the courtyard on level 1, there is a balcony that serves as a podium for the principal to address the school.

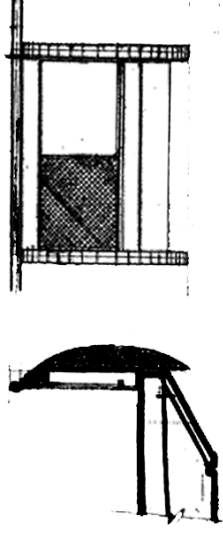
The courtyard has three tiers of trellises providing scale, color and shade year round.

Courtyard Trellis

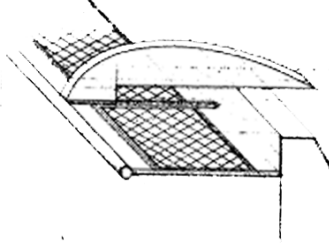


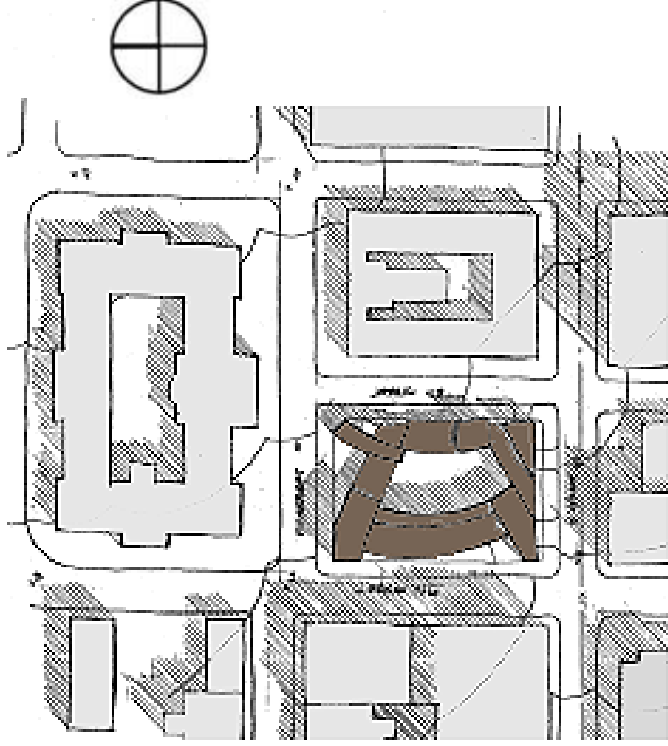
In an *American Glossary of Building* the term "detail" is defined as the delineation to full size or a large scale of any portion of an architectural design. In this interpretation "details" are verbal and graphic means for controlling the work of variable crews.

Each detail tells us the story of its making, of its placing, and of its dimensioning. Light as the source and its force and direction that gave form to the structure.



Hand Rail



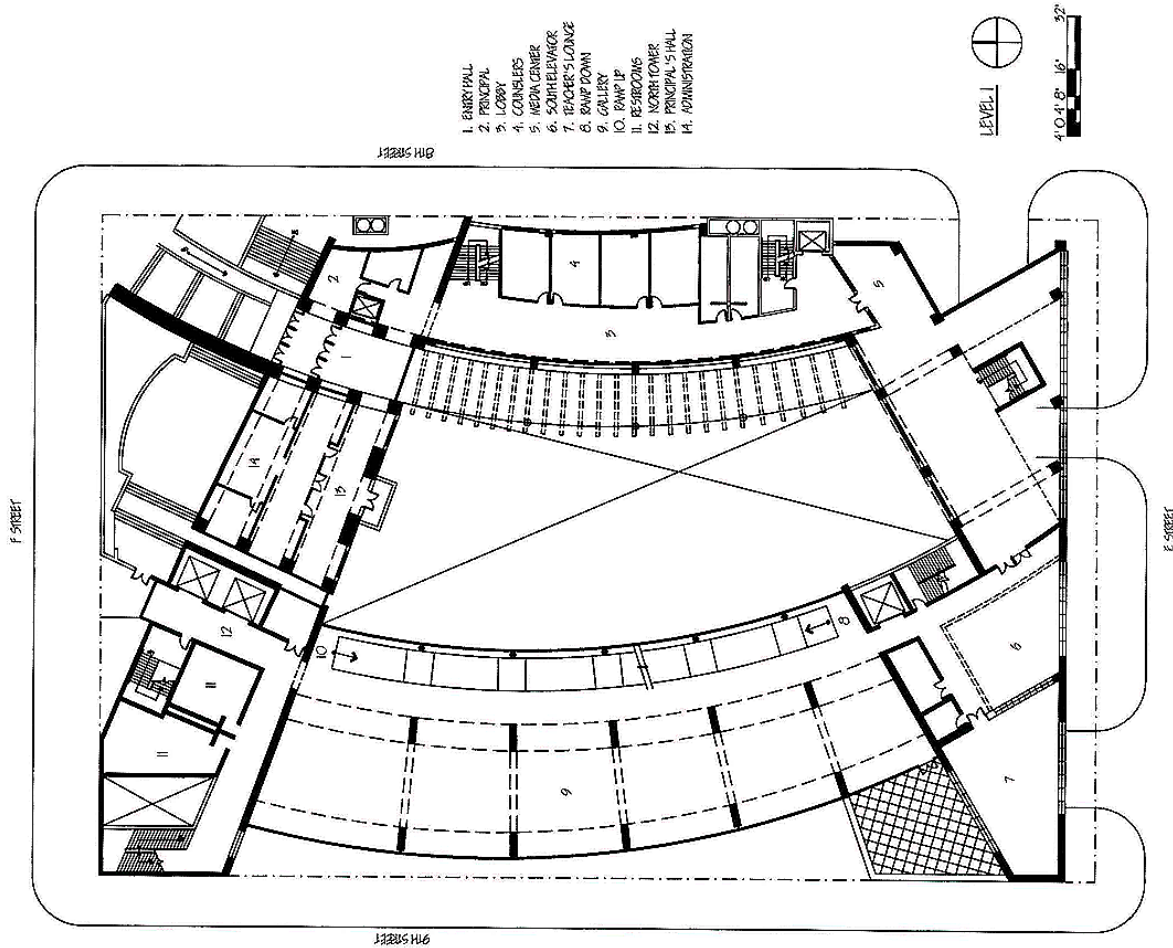


The Entrance

Prior to entering a building's interior; we must first enter the site. When entering a building we cross that invisible line, that threshold that creates vertical boundaries, that separates the spaces....

We stand at the northeast corner of the site and notice the entrance is raised above the ground. We can access via the steps or the ramp, we look up to the front door and realize the main entrance is clearly defined by a huge curving wall and roof canopy, pointing to the northeast, as if it were an extended welcoming hand. The juxtaposition of the vertical, horizontal, inclined and curving planes and forms begin to express the dynamics of the space.

Light is the source of inspiration and all along the structure drives the design. At the N.E. corner under the curving ramp there are stairs where the students will walk down into the mezzanine, breezeway and the courtyard.



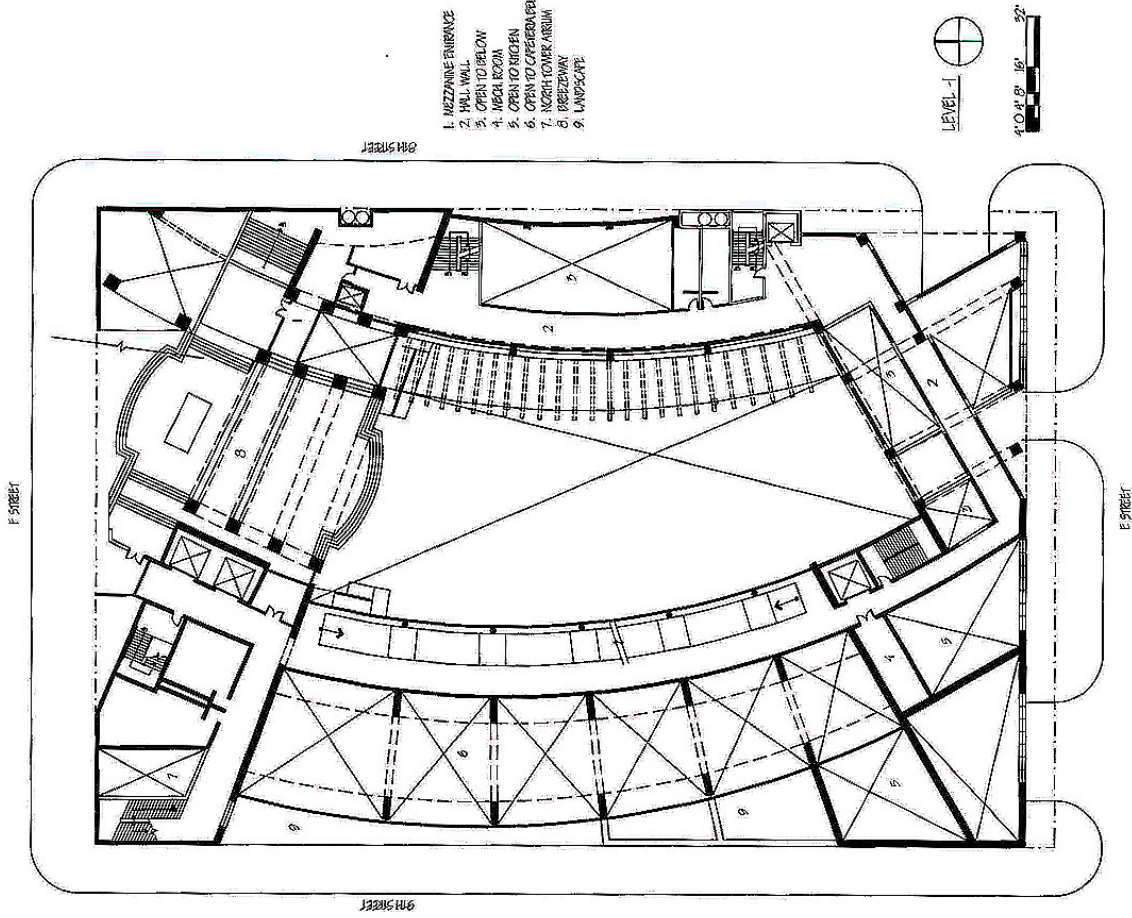
Entry

Level 1

It is said metaphorically that a sound foundation is needed to succeed in any endeavor.

Symbolically this what every student does as he enters the building. The path takes the students down into the base of the structure every day and then they come up to the classrooms. All 9 grades class rooms are located at levels -2 and -1; The 10th grade students move up, they have classes on level 2 and 3; again 11th graders in levels 4 and 5 and the 12th graders on level 6. The top floor level 7, is reserved for design studio. This hierarchical position reinforces the growth and seniority of the student body. This reinforces the school's high regard for the design courses.

The school at this level has four distinct areas: Admissions and Records offices to the north, Administration and Counselors to the east, Media Center to the south and the classroom and teachers offices to the west. The placement of these functions is important as it effects the students' learning process.



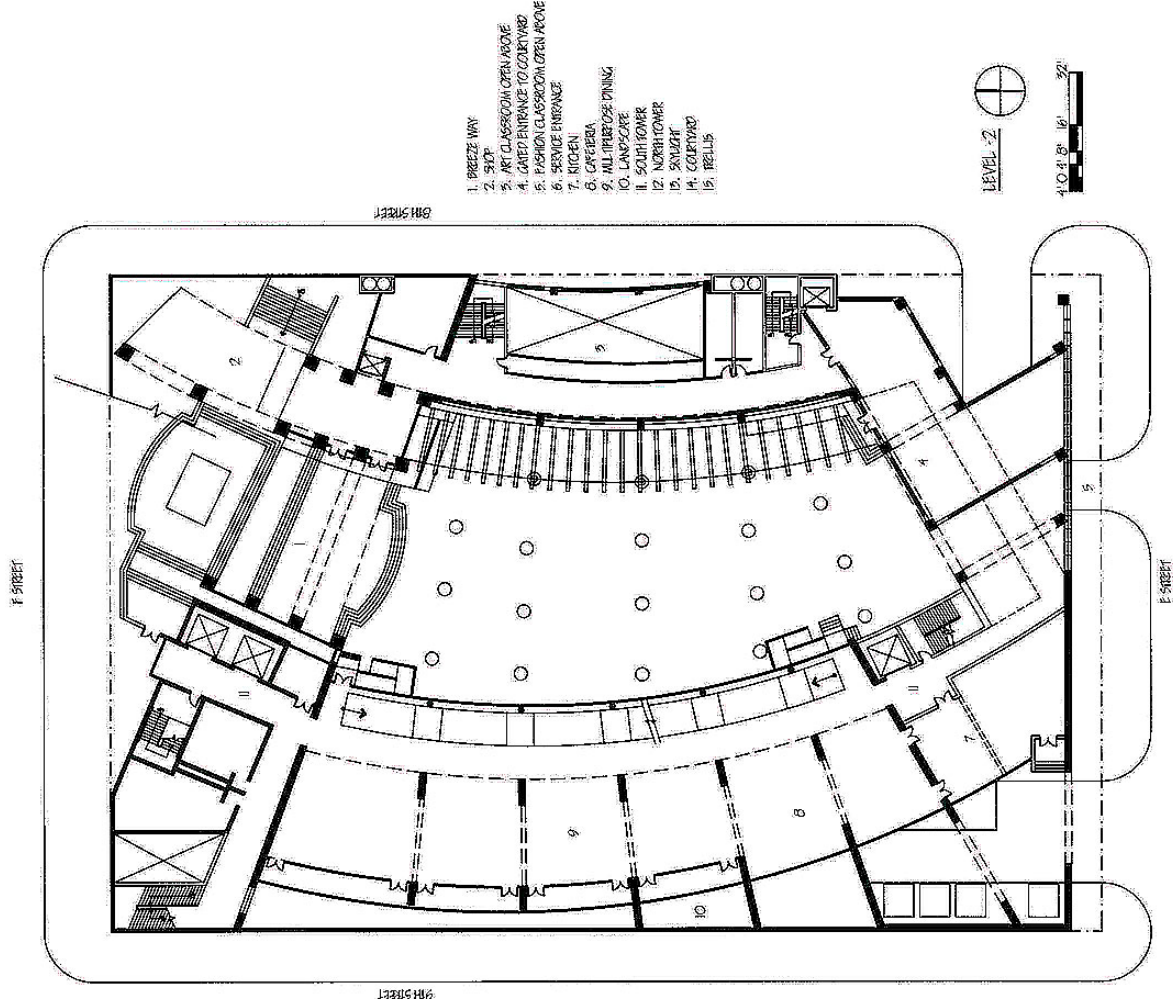
The Mezzanine

Level -1

Light filters through the east wall and the double-height ceilings provide light to the classrooms at the -2 lower level. On the south side there is a bridge that bisects the classroom area below, with a full view to E Street and the school's Courtyard. Once the corridor turns north there is a view of the school's kitchen below. Next is a view of the school's cafeteria below through the enclosed glass and metal skin, and to the right the circulation ramp. Finally at the end of the hall, is the north tower with the student's rest rooms.

Natural light not only reaches all areas of this level but also goes through it.

Light is not the only element spoken by the building at this level, so are shade and shadow. The two connections above this level, between the administration and the media center, create an area for protection but also voids and shadows that emphasize the structure.



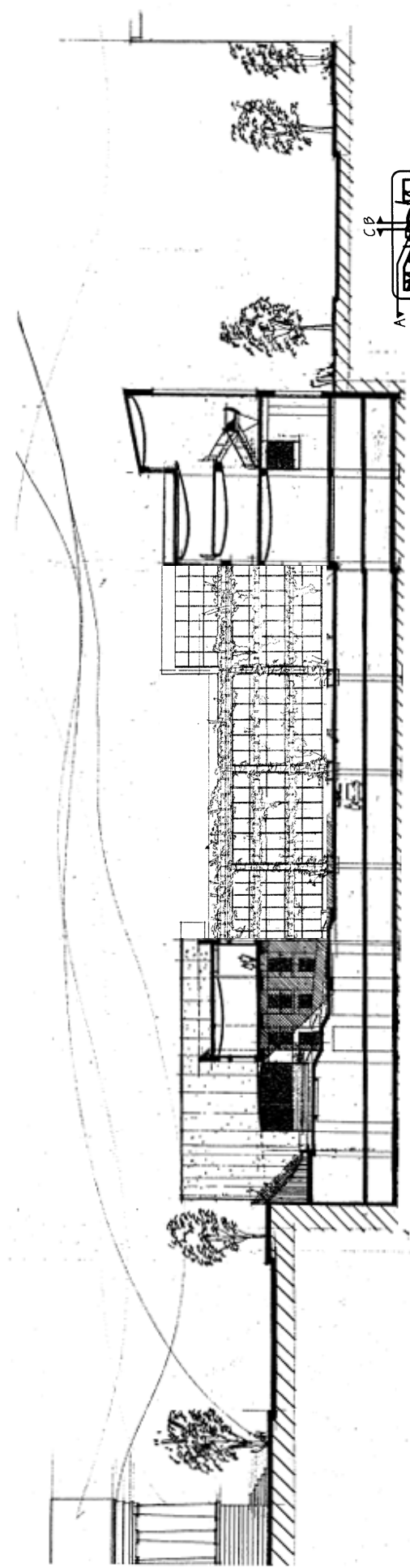
The Courtyard

Level -2

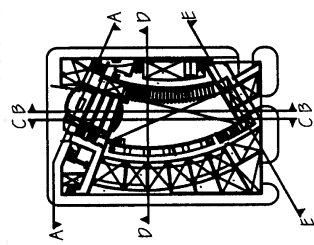
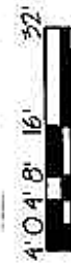
This is the central axis of the school, where illumination is the greatest, where the force of light is received at its full strength.

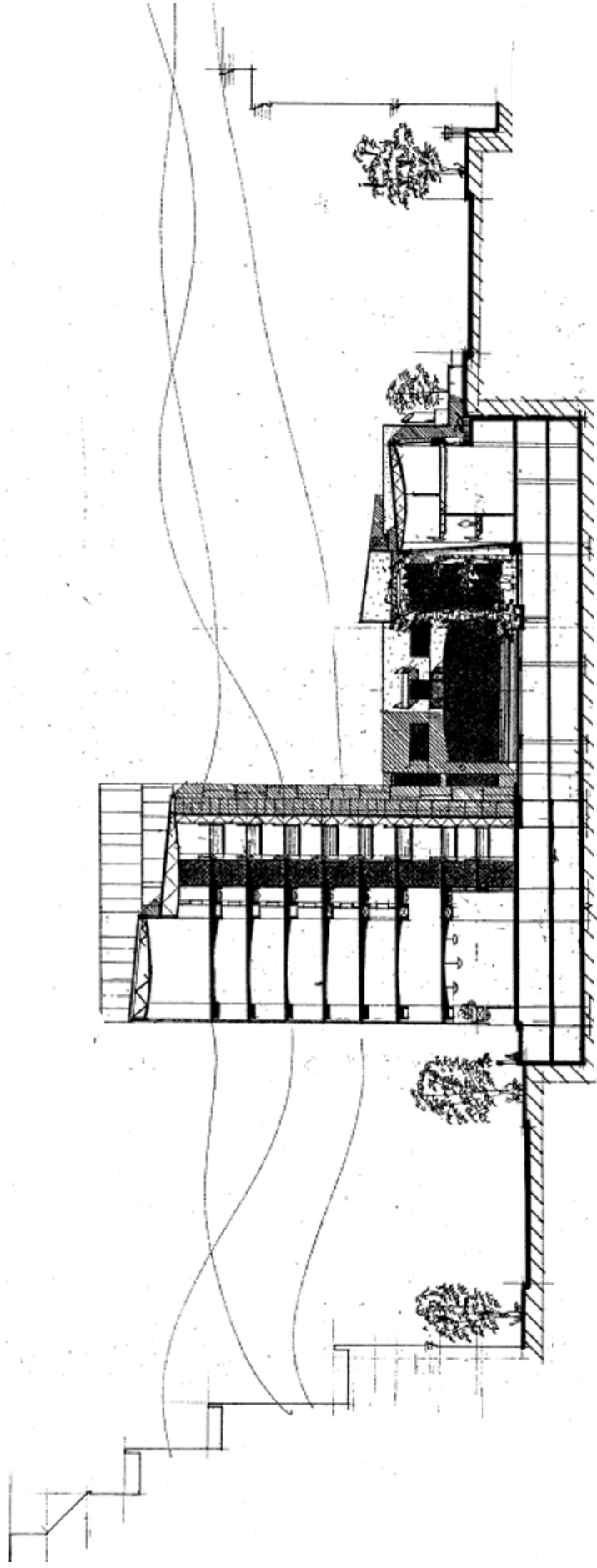
Entering the Courtyard, a defined field of exterior space, involves the act of penetrating a vertical plane that distinguishes one space from another, and separates "here" from "there." This is a negative space with regards to the whole structure, enclosed on four sides, but open on top, for it has no ceiling, where the sky and light roam freely.

The light comes from the east and bathes the wall tower. It reflects the light on the courtyard but at the same times goes through the tower illuminating the ramp that connects all the floors, the hallway and goes through the building (the classroom) and out to the west. This is the same light metaphorically that provides form to the structure. We have said that light gives direction for it travels in a straight line; similarly, we would like to think education provides direction to a student's life.



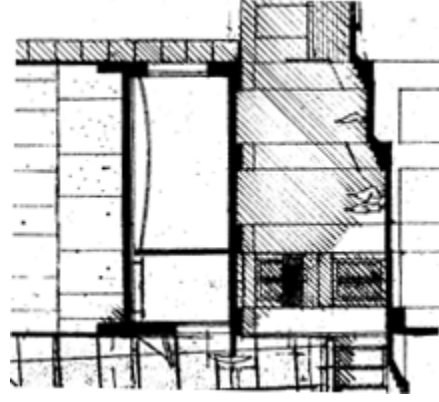
Longitudinal cross section (B-B)



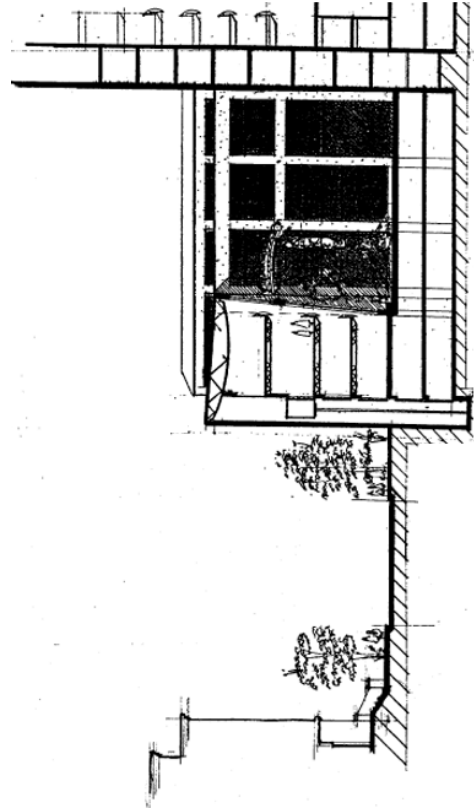


4' 0' 4' 8' 16' 32'

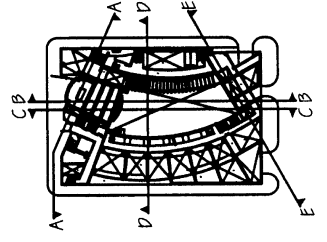
Cross Section (A-A)

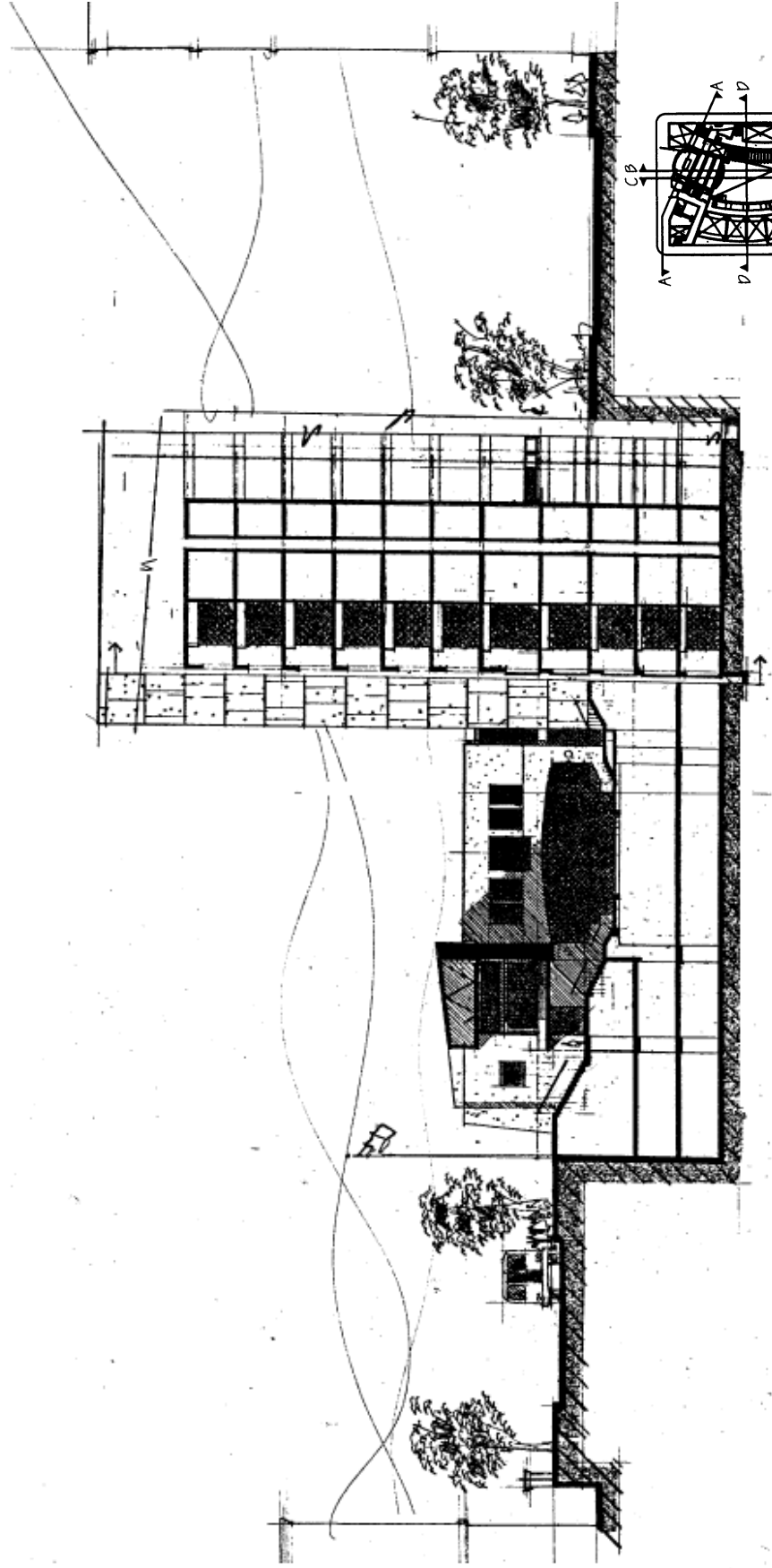


Partial Cross Section (C-C)

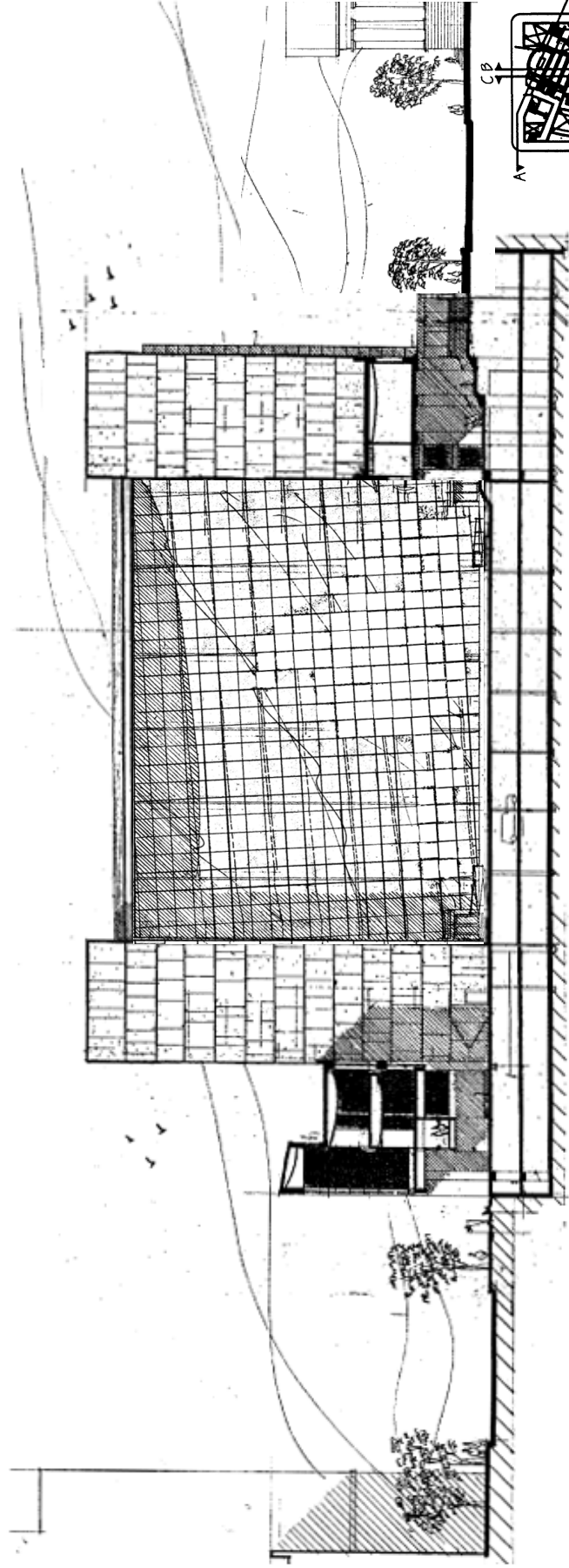


Partial Cross Section (E-E)

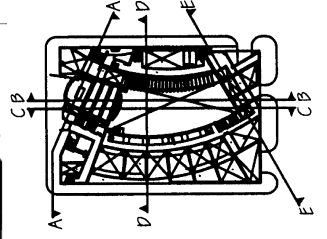


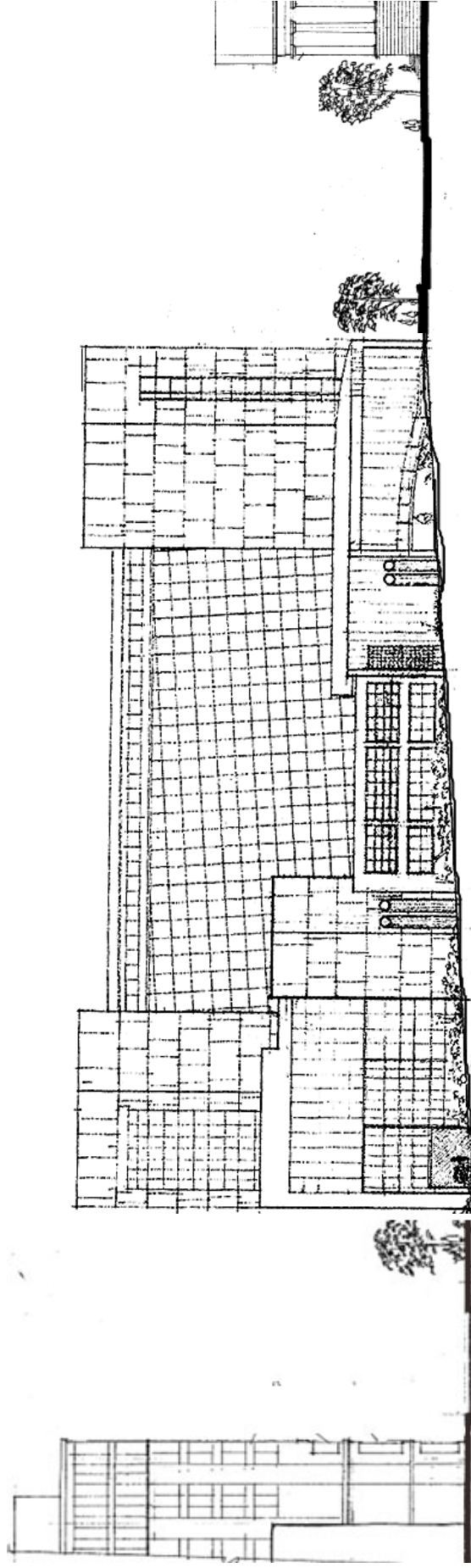


Cross Section (A-A)

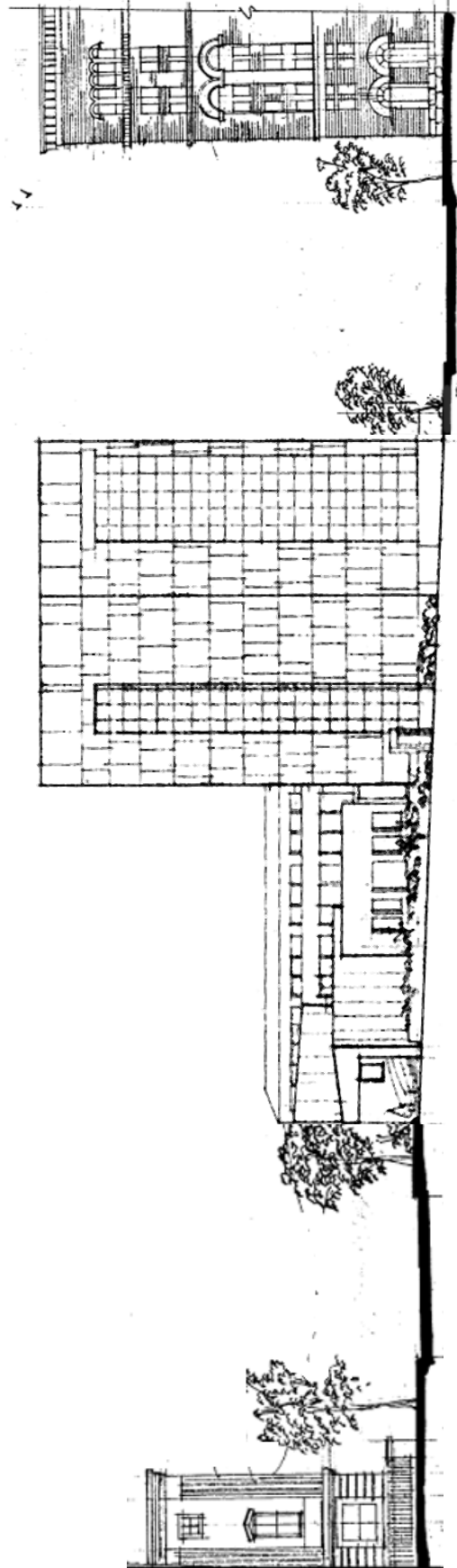


Longitudinal cross section (c-c)

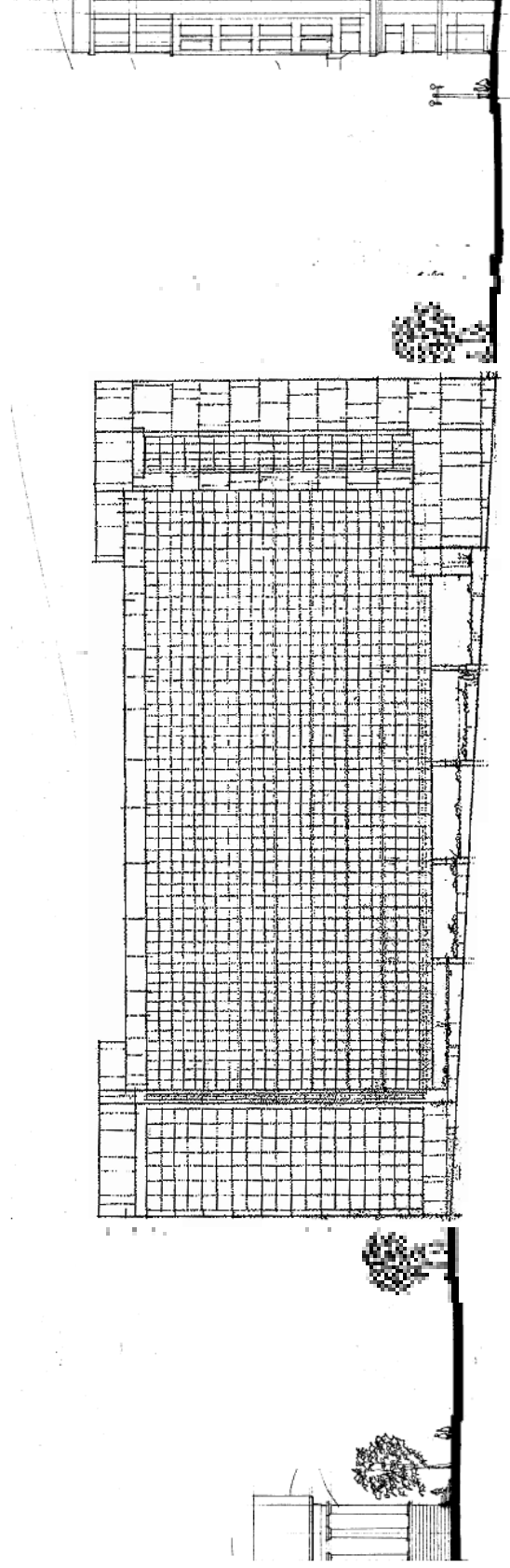




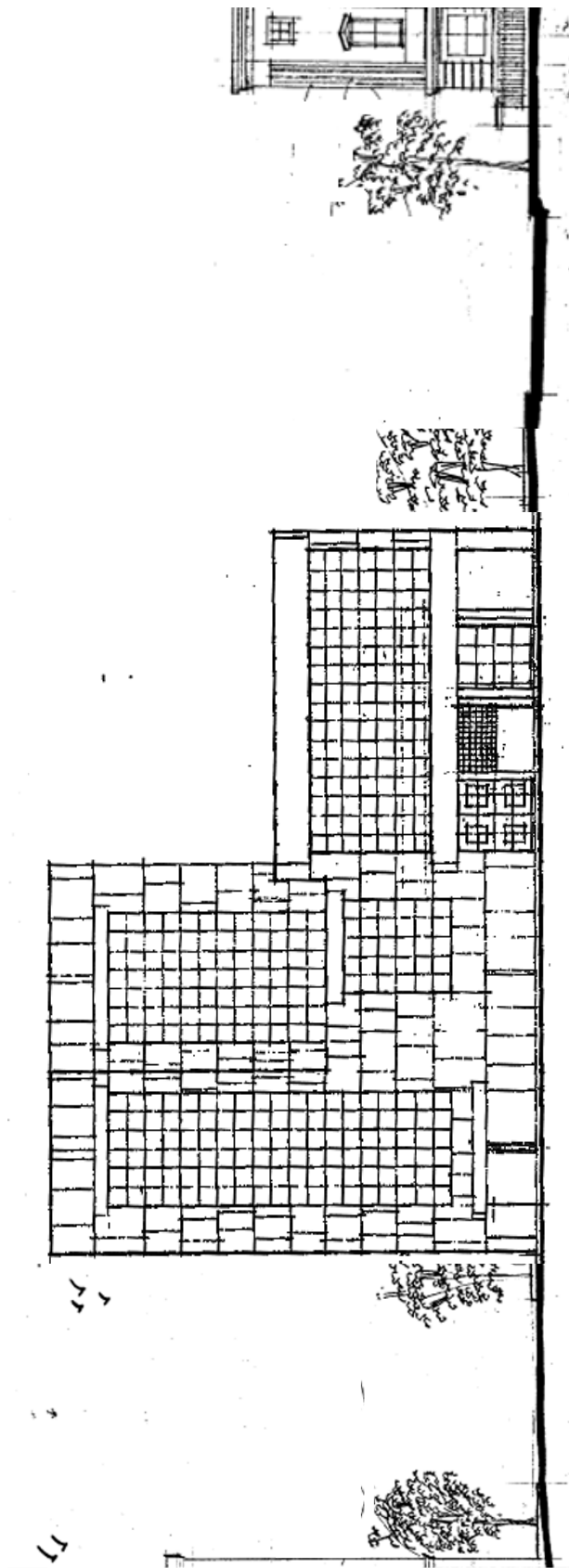
East Elevation



North Elevation



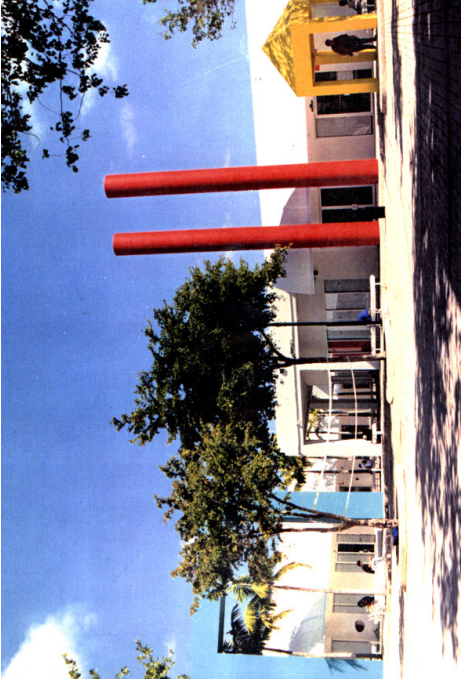
West Elevation



South Elevation

References

- Architecture Design,
The New Modern Aesthetics, 1990
Academy Editions. London./ St Martin's Press /New York
Jenks, Charles, Resurrection and Death of the New Moderns, pp. 20-25
Kurokawa, Kisho. What is Modernism? Pp. 58-62
Libeskind, Daniel. Between the Lines, pp 26-29
- Antonliadis, Anthony, C. Types of Poetics, pp.6-11
The Process of Creativity, pp. 9-23
Poetics in Architecture/ Theory of Design
Van Nostrand Reinhold 1992
- Boyer, Ernest L., and Mitgang, Lee D.
Building Community: A New Future for Architecture Education and Practice.
The Carnegie Foundation for the Advancement of Teaching, New Jersey, 1996.
<http://www.Carnegie foundation.org/community1.html>
- Journal of Philosophy and Visual Arts
Philosophy and Architecture, 1990
Academy Editions. London./ St Martin's Press /New York
Agacinski, Sylviane. Space and the Work, pp. 16-17
Benjamin, Andrew. Distancing and Spacing, pp. 6-7
Ginzburg, Moisei. New Methods of Architectural Thought\, pp. 38-45
Eiseman, Peter. Pragmatic Architecture, page 96
- Educating Architects, Edited by Martin Pearce and Meggie Toy.
Academy Editions, 1995.
- Broadbent, Geoffrey. Architectural Education, pp. 10-23
Russell, Barry. Education in the expanded/in Field, pp. 7-9
Duffy, Francis. Education in Architecture, pp. 120-124
Hanson, Brian. Not Arts and Crafts, pp. 106-109
Pellegrino, Pierre. A Social Philosophy and a Spatial Skill, pp. 54-59
Libeskind, Danie. Observation on Education of Architects, pp. 89-90
Salvestrini, Giovanni. The Teaching Method. More questions than Answers, pp. 42-43
Tschumi, Bernard. One Two, Three: Jump, pp. 24-25
Von Meiss, Pierre. Design in a World of Permissiveness and Speed, pp. 110-115
- The Changing Role of Technology in Architectural Education.
A round table discussion with four NSA
faculty members: Mitra Kanaani, Kathleen Roarty, Ralph Roseling
and Ted Smith. *Cartouche*, Winter
1997-8, pp. 12-13, 15.
- Hinsley, Hugo. Sustainable Cities? Today's Critical Issue for Designers.
Architecture Australia. Spring 1995. pp. 68-69.
- Kanaani, Mitra. Chair's Message. *Cartouche*, Winter 1997-8, p.3.
- Plummer, Henry. Poetics of Light Architecture and Urbanism 1987
Sustainable America: A New Consensus. The President's Council on Sustainable
Development. U.S. Government Printing Office. Washington, DC, 1996.
- Steward, Cecil. Education for an Indispensable Profession: Taking the Boyer/Mitgang
Report Seriously.
Cartouche, Winter 1997-8, pp. 4-5.
- Tschumi, Bernard. The Architectural Paradox, pp. 27-32
The Pleasure of Architecture, pp. 81-87
Architecture and Dysfunction MIT Press, Cambridge, MA 1994
- The Changing Role of Technology in Architectural Education. A
round table discussion with four NSA faculty members: Mitra Kanaani, Kathleen Roarty,
Ralph Roseling and Ted Smith. *Cartouche*, Winter 1997-8, pp. 12-13, 15.
- Steward, Cecil. Education for an Indispensable Profession: Taking the Boyer/Mitgang
Report Seriously.
Cartouche, Winter 1997-8, pp. 4-5.
- Winters, Nathan B. Architecture is Elementary. A Visual Thinking Through Architectural
Concepts.



History

Design and Architecture Senior High School (DASH) DASH opened in the fall of 1990, and is located in the heart of Miami's Design District. The school provides students with a unique, innovative and personalized educational experience. The DASH academic program includes college preparatory courses at regular, honors and advance placement levels. Executive Intern Programs and other mentoring programs offer a range of experiences for students as an introduction to the design profession.

The combination of high academic standards and exceptional design programs allows students to compete successfully for both admission and merit scholarships to many of the country's finest universities and professional schools of design. 98% of DASH students are accepted into prestigious colleges and universities nationwide

Students at DASH are selected through a competitive design-based admissions process. Academic ability and design talent are both evaluated. Once students are accepted they spend the summer in preparatory classes, including drawing, model-making, etc. Once accepted, they must maintain a B average.

The four-year curriculum offers regular H.S. courses, Honors courses and features Architecture, Interior Design, Industrial Design, Communication Design and Fashion Design. With only 465 students in grades 9 through 12, each student receives one on one attention.

In the Architecture and Design courses, the students engage in complex design issues seeking balanced solutions to both theoretical and practical problems of structure and form. Conceptual development and sketches, plans, models and illustrations and juried presentations are steps in the process of problem solving.

In addition, qualifying students receive college credit for many courses through a dual enrollment agreement with local colleges. In 1996, DASH was one of four schools in Miami-Dade County to be recognized by the U.S. Department of Education. Cited as a Blue Ribbon School of Excellence, DASH came into national prominence on the strength of its well-rounded programs. Redbook Magazine called Miami's Design and Architecture High School one of America's best high schools.

The DASH motto is "Education by Design." DASH truly develops students for life.

Jorge L. Bernal
12437 St James Road
Potomac, Md. 20850

Registered Architect Licensed in Florida, Maryland and Virginia NCARB Certificate NO. 32,951	Educational
Professional 1999 to Present Architect, Office of Space and Facility Management National Cancer Institute/ National Institutes of Health Bethesda, MD.	2001 Masters in Architecture Virginia Tech. School of Architecture Alexandria, VA
1988 to 1999 Jorge L. Bernal Architect/ Planner. Miami, Florida. Site planning, residential developments, mid and hi-rise buildings, office buildings, shopping centers, commercial and industrial office parks, custom homes, interior design and space planning.	1997 Graduate courses for Florida teaching certification Florida International University School of Education Miami, Fl
1990 to 1998 Design Program Coordinator DASH Design and Architecture Senior High School, Miami, Fl. Adjunct Professor, School of Architecture Florida International University, Miami, Fl. Adjunct Professor, Miami-Dade County Community College Miami, Fl.	1987 Bachelor in Fine Arts Florida International University Miami, Fl
1983 to 1988 Project Architect, Cano Sotolongo & Associates, Miami, Fl. Responsible for housing developments in Naples, Tampa, Orlando and St Petersburg, Fl.	1972 University of Miami School of Architecture Coral Gables, Fl
1977 to 1983 Project Architect, Spillis Candela and Partners, Miami, Fl. Relocated to Venezuela to oversee new developments. Responsibilities included feasibility studies, site analysis and Proposals for residential and commercial projects, development and construction supervision. Designed and built Over 600 residential units in high-rise buildings.	1968 Miami-Dade County Community College Miami, Fl
1972 to 1977 Principal, Project Management Group, INC., Miami, Fl. Interior design, space planning, design and construction drawings.	Other Qualifications HHS Officer Training Program 12/ 2000 Auto Cad 2000, Excel, Adobe Photoshop, Power point Fallingwater, Frank Lloyd Wright, A residency Summer Program 1993 by The Penn. Conservancy
	Personal
	Nationality U.S. Bilingual English/Spanish