A SCHOOL OF ARCHITECTURE
ADDITION & RENOVATION:
a design pertaining to our process of education

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The goal of this thesis project is to gain a greater understanding of how architects are being trained. The project is a renovation and addition to a building serving as a school of architecture. The design of the school reflects the architectural educational process.

**ABSTRACT**

It is not enough to teach a man a specialty. Through it he may become a kind of useful machine but not a harmonious developed personality. It is essential that the student acquire an understanding of and a lively feeling of values. He must acquire a sense of the beautiful and the morally good. Otherwise he - with his specialized knowledge - more closely resembles a well-trained dog than a harmoniously developed person. He must learn to understand the motives of human beings, their illusions, and their sufferings in order to acquire a proper relationship to individual fellow man and the community.

Albert Einstein from the New York Times, 10/5/52.
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ABSTRACT 3

ACKNOWLEDGEMENTS 4

TABLE OF CONTENTS 5

INTRODUCTION 6-7

ESSAY #1 8-13
Thoughts regarding architecture education

ESSAY #2 14-19
Structure/infill: process of making a building

ESSAY #3 20-25
The role of the architect in educating the public

ESSAY #4 32-49
The fable of the three masons: A holistic approach to architecture

SYNTHESIS: FINAL DESIGN

site plan
first floor plan
model west elevation
roof plan
library floor plan
shop floor plan
second floor plan
third floor plan
model south elevation
section cc
library perspective
section aa
south elevation
section bb
east elevation
gallery wall south elevation
gallery wall section
north elevation
model gallery wall east

CURRICULUM VITAE
INTRODUCTION

STRUCTURE OF THE DOCUMENT

Section five, Synthesis: The final design, shows the model and drawings that were presented during the oral examination. In this section the ideas developed during this author's master's work are expressed in one design project.

The layout of the grid establishes an overall structural framework for the entire book. Within this framework, the layout of each essay varies. This graphic demonstration is an example of the variety of infill possibilities within the same framework. The layout of this book is another example of a structure and infill approach to design. This idea will be discussed further in the second essay.

THE PROJECT HISTORY

In the opinion of this author, there are remarkably few buildings built today that should be considered good architecture. By "good" I mean architecture that is socially responsible, spatially relevant, deliberate, and of its own time and place. One of this author's goals is to work towards changing the state of the profession and improving the quality of the practice. The original concept for this master's thesis was to explore the factors that affect quality in architectural design. Architecture is a profession in which considerable amounts of time and money are invested into building design and development, often producing works that lack distinction. This author wanted to examine the typical architectural process of making a building and explore alternate design processes that could increase the likelihood of producing quality buildings. The approach involves examining a type
of design/build process referred to as "continuous architecture" and comparing it with a typical process of making a building. It was impossible to find an appropriate way to make such a comparison without actually creating two realized buildings.

Thanks to the wisdom and experience of my Thesis Committee, this author was encouraged not to attempt such an enormous project. The Thesis Committee steered the project into a different area of exploration that

eventually led to the current thesis and longer-term goal of discovering a more effective process of making buildings. As a result, it was decided to design an architectural school building that could not only accommodate the existing educational training program, but would enhance it by creating a school that could support both the physical and emotional aspects of academic architectural training. The actual site for this project is the existing Washington-Alexandria Architecture Consortium at 1001 Prince Street in Alexandria, Virginia. The selection of this site was appropriate because both the Thesis Committee and the author had in-depth knowledge of the site and, therefore, could provide more informed guidance for the project. Using this site had the unique advantage of frequent site visits with the Thesis Committee and this author to discuss varying design proposals. Another feature of this site was that it provided the challenge of making a modern addition to a 90-year-old building. This renovation and addition provided the opportunity to create a design which could respect and build upon past structures while accommodating the needs of the present and future.

THE PROJECT ASSUMPTIONS

This thesis project combines the design of an architectural school with the analysis of the relationship between the process of design and the process of how architectural students are educated. The assumptions that are established will be physically expressed in the actual design of the building. These assumptions include the following: (1) because of the general quality of buildings today, the education of architects needs to reconsidered; (2) the architect should have a role in educating the public about Architecture; and (3) there is a direct relationship between the degree of dependence on holistic building design strategies and the quality of a building.
Essentially there are two very different paths to becoming an architect. Each of these educational paths will produce designers with different architectural skills. On one educational path the student is involved in an apprenticeship with practicing architects. On the other path, the student relies upon a formal academic education obtained from an institution as opposed to a practice-based education.

The apprenticeship system is based on a master/student relationship in which the student learns the master's theory and practice over an extended period of time. Eventually, based upon experience in the practice of architecture, the student develops a "mature" understanding of the perspective of one master. After the student becomes professionally "mature" he must then decide which elements of the master's ideas and strategies will be adopted for his own practice, and which elements will be altered to fit his individual goals and needs. It may be helpful to compare this developmental process to that of the parent/child relationship. Similar to that relationship, the attainment of architectural "maturity" requires an extended period of learning under the guidance of an experienced master. If architects are educated in this way, their architectural progress will proceed gradually. It should be noted that the apprenticeship model of training in the architectural field is almost non-existent today. In this author's view, the apprenticeship approach should be reconsidered as a viable option for architectural education.

This project is not directly focused on an exploration of how to educate architects. It does, however, address how the process of formal education affects architects and their development. One goal of this project is to create a design that physically represents the
QUESTION:
What is the difference between the architects on the top row and the architects on the bottom row?

ANSWER:
Only the architects on the bottom row graduated from architecture school.
existing system in which architects are trained. This design will emphasize the formal architectural process so that the student environmentally understands the structure in that process.

Academic architectural education has been the dominant educational approach as the field has transformed from a craft into a profession. In a traditional academic setting, students are exposed to a wide range of ideas, concepts, processes, and possibilities within architecture. The spectrum of ideas and processes that the student is exposed to may often be incongruent.

For the student, it is often difficult to integrate and synthesize theory and design without being grounded in applied field experience. The challenge for faculty is to expose students to different ideas and processes while also providing them with integrative experiences which can guide their design choices. It is then incumbent upon the student to apply and test these conflicting ideas in their studio work and eventually in their practice.

In the 1880s, one goal of architectural schools was to transform the practice of architecture into a profession. One of the requirements for defining a profession was establishing a common body of knowledge. Having a common body of knowledge is the foundation of academic learning in architecture. In medicine, the common body of knowledge is the physiology of the body and mind. In U.S. law, the common body of knowledge is the Constitution and case law. In architecture, there is no set of "scientific principles" or "definitive standards" on which to form a basis for judgment and evaluation. In architecture, the common body of knowledge is formed by the history of the profession, and all of the previous significant work that has been conceived and produced. In architecture, the accumulation of knowledge about past work is vital to the profession. What distinguishes academic education from the apprenticeship process is the crucial role of the academic library as a repository for the common body of knowledge. In formal education, students' experience is based upon studying buildings constructed throughout the world and through time. The only way to access this information is through the library.

This project will consider
a design for an architectural school that represents the structure of our formal education in the academy. The parti of the design illustrates and provides a metaphor for the formal academic learning process. For example, the entrance of the school has been designed to begin with the library, which is the repository for the collective knowledge base. We access this knowledge through the library.

The diagram of the building is divided into four main components. The library, the student studio space, the exhibit gallery, and the faculty offices. The library is what I call the "portfolio of past potential" a place which holds our collective knowledge. In the academic setting, this is the foundation of our learning.

Extending this metaphor, the exhibit gallery for the students' work may be thought of as a "portfolio of future potential". It is important that students' work be displayed both to the school community and to the larger community. It is also important that students' work be placed above the gallery, students' studio, and library because the faculty represent a link between the past, present, and future. It is a place for those who give guidance and direction.
The terms "structure" and "infill" refer to the actual building construction of this project, yet they also provide an interpretive metaphor for the current architectural education process. Academic education is a five- to seven-year training period that attempts to develop a learning framework within which the student can understand, discuss, and create architecture. Such a system sets up a structure for the student to "infill" or to define through personal understanding. This system provides an
enduring knowledge base for content and process which architects can use throughout their careers.

At each separate school, the educational emphasis, or "structural framework", is determined by the faculty and, therefore, will vary among the schools. During the academic course, most students are exposed to prevailing architectural ideologies. It is the role of the student to understand the "structural framework" as defined by the academic program, and then to "infill" that framework with their personal design biases. The beauty of this system is that although the initial structure establishes a basic educational foundation, the architect-in-training can build upon this foundation in a variety of different ways. This process of "infill" continues throughout the career of the architect. As was mentioned earlier, this educational process differs from the master/student relationship in that the student is allowed the freedom and flexibility to explore ideas that depart from the singular view of the master.
THE SITE
Both the site plan and the building structure of the renovation and addition reflect the metaphor of structure/infill (see graphics, p. 11). The site, at the corner of Prince and South Patrick Streets in Alexandria, Virginia, is unique in the neighborhood. It is the only building to be sited as a 'suburban site plan' in an urban context. The building is an island surrounded by parking spaces and a front open area that serves only as an unusable front yard. This proposal is to 'infill' the site so as to make it a more urban setting for the school. The existing school building is the "structure" and the area that was possible "infill" was the remaininig site.

THE LIBRARY STACKS
The design of the library stacks (see graphics, p. 12) offers another example of structure and infill. The structure of the stacks supports the roof of the library and is infilled with the bookshelves and books.
THE STAIRCASE
The staircase in the main circulation area works as the vertical structure which is infilled with the horizontal stairs (see graphics, p. 13). This area was considered the link between the existing buildings and the additions. There was an effort to expose a structural continuity of these areas.

THE GALLERY WALL
The design of the gallery wall (see graphics, p. 13) also illustrates structure and infill. The concrete wall is the main structure. The secondary structure is the steel frame enclosure system that hangs from the concrete wall. The steel frame system can then be infilled with the materials appropriate for the interior function. For example, if the interior area is an office, the steel framework would be infilled with operable windows and appropriate shading.
ESSAY 3
One goal of the school should be to find an educational approach to demystify architecture. Architecture school should not only be a place to teach students about how to design, but should also be a place to teach the non-architectural community about the value of good architecture. The design of this project will address the education of the public.

One way to diminish the barrier between architectural education and architectural practice is to educate potential clients and the general public about design values in architectural education. There is a great lesson in this for architects-in-training, because creating a relationship with the public provides reciprocity in learning both for architects and clients. This simple but
important gesture can help
cate the public about
architecture relates to the
survival of the profession.
if the public does not
identify a need for archi-
tects, then the public will
not understand their value.
Consequently, fewer archi-
tects may be needed. This
author believes that if
architects honestly and
patiently relate what de-
signers can do for the
public, the public will shape
the demand for well-con-
ceived and carefully-de-
finite architecture.

The design of this project
allows and encourages the

BURIED ACORNS STUDY MODEL

DRAWING OF BURIED ACORNS PROJECT
community to access certain areas of school both visually and physically. It is important that the public witness the process of struggle and exploration in the design process. It is also important that the general public understand the amount of time and creative energy that goes into each design. However, a balance between community access and student privacy in the work areas must be achieved and maintained both for the quality of student education and the integrity of academic freedom. For example, public viewing of wads of tracing paper and chaotic work stations would not facilitate public understanding of the architectural design process.

That is why the studio and classrooms are predominantly only for the school and are restricted areas to the general public. The public will be able to use the school space in two distinct ways. One way for the public to interact with the building is through engaging visual possibilities. For example, what do pedestrians see as they pass by the building? Is there a place to sit and talk with other people and to students? What is there to see when driving by, and how does the view differ from various vantage points? The second way in which the public can experience the
building is to be invited into designated sections of the building. There are some ideal places that ought to be open to the public. One is a gallery area (what I previously referred to as the "future potential" which displays student works and traveling architectural exhibits. This would require there be a separate entrance to this space. Another area that should be open to the public is the library (what was previously referred to as the "past potential"). This would also require a defined access area for the public. There should be designated exterior areas in the transitional spaces of public vs. school area. These areas would help to encourage interaction. Finally, the public should be invited into the building for lectures and student reviews.
ESSAY
4
An architectural project needs to be thought of holistically, its whole being greater than the sum of its parts, rather than as a collection of separate parts. A holistic building is not one which looks stylistically uniform, but rather is a building that reflects congruent ideas and rhythms, materials, and goals which are expressed throughout the project. A brief fable may help illustrate this idea.

The Fable of the Three Masons

Rey, the wisest person in the city, went looking for a mason to help make a house in which he could live out the rest of his life. Rey wandered into the bustling town center to talk with masons who were working on three sections of a large structure. He first approached a young woman laying bricks, and asked a seemingly obvious question, "What are you doing?" She abruptly stopped her work, stood up and in a curt tone, replied, "Laying bricks" Rey was not impressed with either her attitude or her understanding of her work and he quickly moved on. Rey asked the same question of the next person he saw laying...
bricks — "What are you doing?" This man finished laying the mortar from his hawk, placed the wet brick on the fresh mortar, lightly tapped the top of the brick, stepped back to review the grout line and replied, "Building a wall!" This answer was a little better than the reply of the first mason, but Rey was not satisfied. He moved on to continue his search for a worthy mason. Rey approached an older woman laying bricks and again posed the question, "What are you doing?" The woman did not stop the fluid and rhythmic motions of her work and simply replied, "I'm creating a Cathedral!" Rey immediately knew that he had found the right mason to make his home.

One goal of this design is to create a new addition and renovation which would respect and build upon past structures while accommodating the needs of the present and future. At the beginning of this renovation and addition, I looked at the many rhythms of the existing site and building. These rhythms were to be considered part of the "DNA" of the renovation and the new additions. Rhythm refers to the continuity and congruence of materials from one part of a
structure to another. For example, the rhythm of solid and void in the facade of the existing building was a very strong element of the building. The rhythm in the facade was also apparent in the design of the center circulation space for the stairs.

On the gallery wall, the steel frames created a new rhythm which had to be integrated with the rhythm of the existing buildings. In the center of the building, where the main entrance is located, these two rhythms form a distinct harmony. This decision to integrate these two rhythms at the entrance is appropriate because this is the interface of the new and existing structures.

Designing the entrance to this building was a challenge because it required the integration of classical symmetry of the existing building with an asymmetrical site. The site has three different edge conditions. The south side, which is the main entrance, faces a relatively quiet residential street (Prince Street). The east side is adjacent to a high traffic street (South Patrick). The north and west sides abut buildings and parking lots. Because the building is situated so that it faces both tranquil residential area and busy commercial areas, the decision to
locate the entrance should take into consideration the immediate environment. This decision should be made to favor the more classical features of the tranquil south side, as the original classical building dictates. The decision regarding the location of the entrance helped in understanding the points of connection for the new and existing structures. If we are to respect the classical symmetry, the optimal point for this connection would be the center spine of the existing building. From the east side (South Patrick elevation), the symmetry of the building was less important.

Scale was another consideration in the holistic design. The critical element of the east side elevation is the scale of the adjacent buildings which shift from residential to commercial. The height of the library is related to the base of the existing building and the scale of the pedestrians walking on Prince Street. The height of the gallery wall is connected to the overall height of the existing buildings and the view of vehicles on South Patrick Street.
The drawings and models in this section are the same as those presented at my final thesis oral examination. The text of this section is divided into five parts: the site, the library, renovation of the existing building, the gallery wall, and the conclusion.

THE SITE
As described earlier, the site issues were analyzed and resolved using a design process of "structure and infill" (see essay 2). The building is considered to be the structure, and the remaining area of the site is the potential infill. The following sections discuss several problems related to the site which the design addressed. These include: (a) additional square footage, (b) space between Prince Street and the existing building, (c) scale of the addition, (d) materials, (e) exterior areas, and (f) vehicular access.

A. The design program addressed the school's need for more usable square footage (see chart, p.56). It was important for the existing school building to maintain its space and natural light, and the remaining area of the site is the potential infill. The following sections discuss several problems related to the site which the design addressed. These include: (a) additional square footage, (b) space between Prince Street and the existing building, (c) scale of the addition, (d) materials, (e) exterior areas, and (f) vehicular access.

B. There were many design proposals associated with the open area between the existing south facade and the Prince Street sidewalk. The decision to maintain the placement of the front entrance to the building was made because this entrance is both visually powerful and easily recognizable. This then led to the decision to place the library in this open area (see part diagram, p.13). The only way to add space to the library was either to expand underground or to build at the level of the base of the building (about 9' above the sidewalk). This design incorporated both. After making the decision to extend toward Prince Street, the area between the building and South Patrick St. seemed barren and in need of balance. Therefore, the gardens and ramps were designed to be below the base of the building on the east side (see First Floor Plan, p.35). This extended the base of the building to the two sidewalks which helped...
maintain the urban feeling and the boundary between the public and private areas. This boundary can be seen when comparing the existing site plan (see p. 7) to the proposed site plan (see p. 34).

C. The scale of the new additions are different due to varying placements on the site. The reason that the library addition was built only one story above grade was to keep it from competing with the existing south facade (see south elevation, p. 42). It was determined that the height of the library should be consistent with the stuccoed base of the existing building. The height of the gallery wall was designed so that it would have a visual impact from South Patrick Street.

D. Selection of materials was also an important site consideration. It was decided that the materials used for the additions should be consistent with the existing brick, concrete, glass, and steel. The use of identical materials helped to establish a visual continuity between the old and new sections of the building. However, the materials were not meant to be an exact match, but rather were used in different proportions and in a manner that distinguished it from the original building. Again, the addition is not in any way pretending to be the original building.

E. The site needed to incorporate usable exterior space for the school community. This space was needed to accommodate social activities, exhibits, and gathering places for discussion groups. The site proposal has two distinct types of seating areas: one area is on the roof of the library reading room. This is part of the entrance sequence and the "Plano Nobile". This area faces due south and is ideal in fall, winter, and spring. The second area is on the east side of the building. This area has a small amphitheater that is ideal for small classes and group discussion.

F. Many of the site considerations were based on the need to have some

<table>
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<th>SQUARE FOOT COMPARISON BETWEEN</th>
<th>Existing Bldg.</th>
<th>Proposed</th>
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<td></td>
<td>(sq. ft.)</td>
<td>(sq. ft.)</td>
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<tr>
<td>LIBRARY</td>
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<td>4500</td>
</tr>
<tr>
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<td>9000</td>
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<td>PARKING SPACE</td>
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CHART # 1
parking and access to the entire building, as well as access to the Mental Health Building to the west. A design decision was made to construct a very narrow building on the north side where the existing parking lot is located. By creating a narrow building, many of the existing parking spaces could be maintained, and the flow of traffic could be altered. The existing "dead end" situation was converted to a one-way flow of traffic that starts on Prince Street and exits onto South Patrick. This change to a one-directional traffic pattern would be safer and would create a better traffic flow. This change also provided an opportunity to place the automobile portal on the south edge of the site signifying where the cars would enter. With the help of the two sets of stair towers on the west side, the portal provides an anchor for that end of the site.
SHOP FLOOR PLAN
elevation 91
THE LIBRARY

One of the essential design criteria was to translate the metaphor of "going through the library" into a physical reality. This was accomplished by having the main entrance sequence pass by the library and by having visual access through the windows into the library (see model south elevation, p. 42). The sequence begins when a pedestrian on Prince Street walks along the side of the library and has visual access to the library. There are two ways which pedestrians can view the books. One view is perpendicular to the sidewalk. For example, if a person is in the library, the pedestrian can see the profile of the person browsing the stacks. The other view is parallel to the sidewalk and, therefore, the pedestrian sees the back of the person in the stacks. After passing the stacks, the pedestrian entering the building would turn on axis with the main entrance (see first floor plan, p. 35). At that point, there are some very gradual steps between the two sets of stacks, and there is once again another chance to glance into the library. At the top of this first set of stairs there is a large concave window that overlooks the main reading room, providing another opportunity for the visitor to experience the library. At this point, the visitor would then turn perpendicular to the main entrance and ascend a stair case that leads to the "Piano Nobile" which is on the roof of the reading room. This entrance sequence continuously reinforces the experience of "going through" the library to get to the school.

Inside the library are two different types of spaces (see perspective, p. 43). There is a double height reading room, with natural light streaming in from the top. The book stacks are on two levels. The upper half of the stacks are at sidewalk level and visible to pedestrians walking by the building. The stacks are designed so that the vertical structure of the building also serves as the structure of the book stacks. This provides another example of structure and infill with the horizontal shelving and the books being the infill. There was also consideration to make some of the stacks parallel to the sidewalk, while others were perpendicular to the sidewalk, thus allowing passersby to enjoy the different "dances" of people reviewing and retrieving books from the stacks.

Idea for the rhythm of the facade for the library emerged from clues found within the existing building (see south elevation, p. 44). The existing building is separated into two halves, so that from the sidewalk the library appears to be separated into two different parts. The rhythms of the windows from the south elevation are guides for the rhythm of the windows and skylights of the library. The different windows in the library facade correspond to the different types of book stacks in the library.
Existing Building Renovation

Any project renovation design must first respond to the question of which aspects of the building should be reconsidered and which are worth preserving? The area that needed the most improvement was the circulation. It was decided that the classical symmetry at the center of the building needed to be emphasized. This center area is the pivotal point of the circulation of the building. At this pivotal point, there needed to be a reception area to receive visitors (see first floor plan, p.35). The offices, administration, and secretaries were, therefore, located in this area. Interestingly, after this decision was made, it was discovered that this was the actual location of the reception area and administrative offices when the building was originally designed as an elementary school.

One of the weakest design aspects of the existing building was the main entrance which came into the building on a split level of a stair, similar to a typical split-level ranch house. So in the existing building when a visitor arrived, there was an immediate hesitation about where to proceed within the building. One of the challenges for this proposal was to clarify the entrance sequence and have it lead to the appropriate place in the building. One of the critical factors in this decision was the level at which the entrance should occur (side-walk level, first floor level, or a possible entrance at the second floor level). The first floor level was decided upon, which grounded the idea of the "Plano Nobile" to extend to the exterior (see section CC, p.43).

As shown in the drawings, the main entrance is on the first floor. This entrance leads a visitor from a glass enclosed air lock, into a one-story space and then into a three-story space enclosed by a glazed ceiling (see section BB, p.45). The stairs are located in this space. The main circulation needed to remain in the center of the building, but was shifted to both sides, thus creating a three-story opening which allowed natural light into the entire building during the day. This three-story opening appropriately created the largest volume of the building in the most public area. This verticality of this atrium is emphasized by the cylinder elevator on the north side of the space. This was designed to enable you to see the vertical motion of the elevator car. The design of the stairs provides another example of structure and infill. The vertical structure of the stairs also serves as the structure for the new part of the roof. The treads and landings are the infill for that structure.

Another important design decision involved converting the existing attic into usable space (see third floor plan, p.41). This area was converted into studio space. In order to achieve better lighting and greater head room, the ridge line between the two hip roofs needed to be raised. This provided an opportunity to replace that part of the roof with a steel and glass ceiling to allow natural light. The roof was also designed as a structure and infill system. In the center bay, the glass has the largest openings. This bay was designed with glass that would allow the greatest amount of light to be transmitted. Each bay has glazing that darkens gradually as it moves away from the center bay.

When the third floor area was converted into usable space, there needed to be additional fire stairs. These proposed stairs slightly break the symmetry due to the open space required for the great lecture hall. The great lecture hall was necessary to accommodate large public events in the school. Incorporating the lecture hall was essential to the school's goal of opening educational opportunities to the public.
THE GALLERY WALL

It is the gallery area that allows the public the opportunity to view the work believed worthy of public attention. This is one place in which the academic community can have a strong influence on the general population.

The gallery area represents the process of movement. The wall runs east and west, so exhibits are either on the north or south side. Upon entering, the visitor penetrates the plane of the wall (see south elevation of gallery wall, p.46). Being on the north side, the visitor then walks up a gradual ramp that exhibits work hung on the concrete wall (see north elevation, p.48). When the visitor reaches the end of the first ramp, one finds an opening to an area that accommodates larger three-dimensional objects. As the visitor proceeds to the south side, a totally different type of natural light illuminates the exhibit space. Half way along the south side of the wall there is another penetration of the wall which leads back to the north side of the concrete wall. Following this there is a horizontal exhibit area ending in a large volume that is void of the center wall (see model north elevation, p.48).

This sequence is isolated from the administration area of the building which has the faculty offices on the upper floor. These offices have a corridor on the north side of the concrete wall which are accessed by penetrating through the concrete wall. The offices which are on the south side need shading control. Each bay has an individually-controlled louver system which is perpendicular to
CONCLUSION

An architectural school is a bridge for the students and is a place for combining personal growth and professional training. I am in training to be an architect because I believe that our physical environment has a definite effect on the quality of life experienced by individuals in a building. I will finish this essay with a quote that I would like to see chiseled into the concrete wall at the beginning of the entrance sequence.

"How strange is the lot of mortals! Each of us is here for a brief sojourn; for what purpose he knows not, though he sometimes thinks he senses it. But with deeper reflection one knows from daily life that one exists for other people - first of all for all those upon whose smiles and well being our own happiness and well being is wholly dependent, and then for the many, unknown to us to whose destinies we are bound by the ties of sympathy."

ALBERT EINSTEIN, 1931.
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