

THE EISHIN SCHOOL PROJECT



A Professional Report by

Ken Peterman

THE EISHIN SCHOOL PROJECT
THE CREATION OF ORDER IN A GROUP OF BUILDINGS



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ABSTRACT

The Eishin School Project was an experiment which attempted to formulate a method by which a new theory of order could be made useful for the design of complexes of buildings. This notion of order, being developed in the Center for Environmental Structure, connects the issues of value and geometry. In essence, it contends that order and beauty in buildings result directly from the presence of an objective, good geometric structure. This structure is composed of a network of centers, which are discrete, whole physical entities that can't be defined without reference to their context--the smaller centers of which they are formed, and the larger centers they help to create.

In creating the large-scale order for a complex of buildings, one must resolve two structures of centers, those existing on the site and those required by the project. When these geometries are merged in a way that maintains their individual beauty, an independent global structure is created for the building complex that transcends the individual character of the project's internal geometry and the structure existing in the context.

The work on the Eishin School had two phases, an academic project, and the actual work carried out in the Center for Environmental Structure. Both parts took as their main goal to create a beautiful global structure for the new campus, and both followed a similar external process

that had three steps. The first step defined the internal structure of the school in writing. The second step studied the site's structure in an indirect manner. And the third step attempted to resolve the structures of the context and of the project. The final step was problematic, but finally succeeded when the medium of the work changed from plan drawings to a model. The model fostered a different perception of the work in which the developing campus was seen as an artifact, an object that could be manipulated and made more beautiful. The underlying assumption of the project, that order and beauty are objective characteristics of the geometry of a building or group of buildings, encouraged the work to concentrate seriously on enhancing the beauty of the new school's form as it evolved.

INTRODUCTION



The Eishin School is a high school in Japan that is expanding its curriculum and faculty to include college level course work in the study of local governments. The decision to expand has led to the planning of a new campus to house both the existing high school and the new college's four departments. The school will eventually have 1,200 high school students, 800 college students, 100 faculty, and will have a built area of about 13,200 m². A site has been chosen for the project near Tokyo, and planning of the new campus's site plan has been completed.

Work on the project is being carried out in the Center for Environmental Structure. Specifically, the Center was asked to develop a pattern language for the school, to lay out the site plan for the campus, and finally, to design the buildings of the site plan in detail. This report will cover only the first two parts of the work: the development of the pattern language, and the creation of the overall structure of the campus. In addition to the Center's work on the school, the project was presented as a studio exercise. My work on this problem as a student, as well as my observation and participation in the Center's work on the Eishin School are the basis for the analyses and conclusions of this paper.

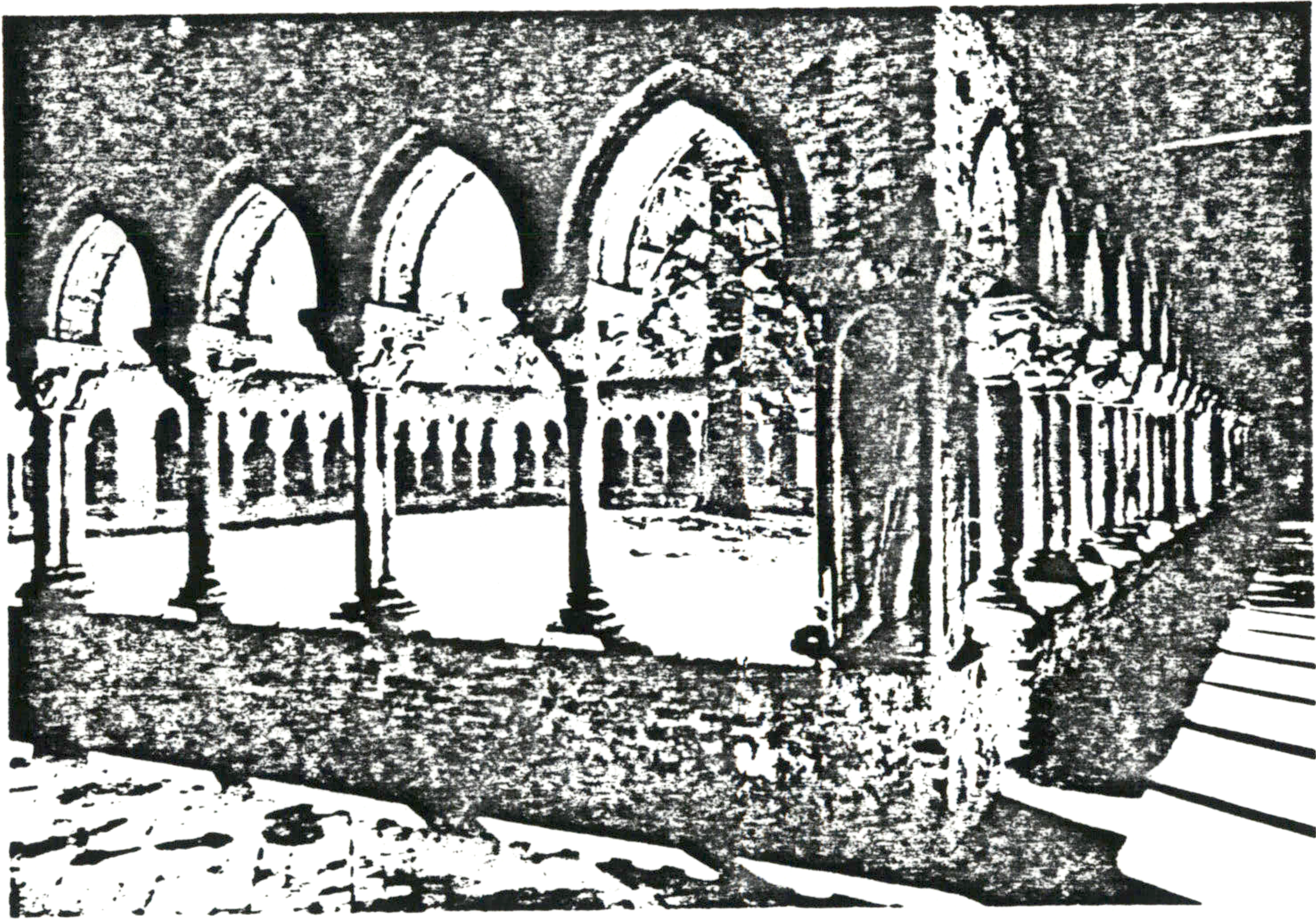
The purpose of this report is to examine ways that the Eishin School project has made a new theory of spatial order operational for the design of large building projects. This theory, being developed in the Center, has defined a process of design, the "centering process," that seems to underlie the production of beautiful buildings and towns. The Eishin School is a project that studied how the centering process could be used to establish the overall, global form of a complex of buildings. It was an experiment which attempted to clarify how these new theoretical assumptions could be utilized in solving the practical problems associated with creating order in a site plan.

The notion of order that this project takes as its basis is founded on two interrelated assumptions dealing with the issues of value and geometry. These assumptions, in essence, hold that the goodness and beauty of a building, or a complex of buildings, is an empirical phenomenon which is associated with specific geometric attributes.

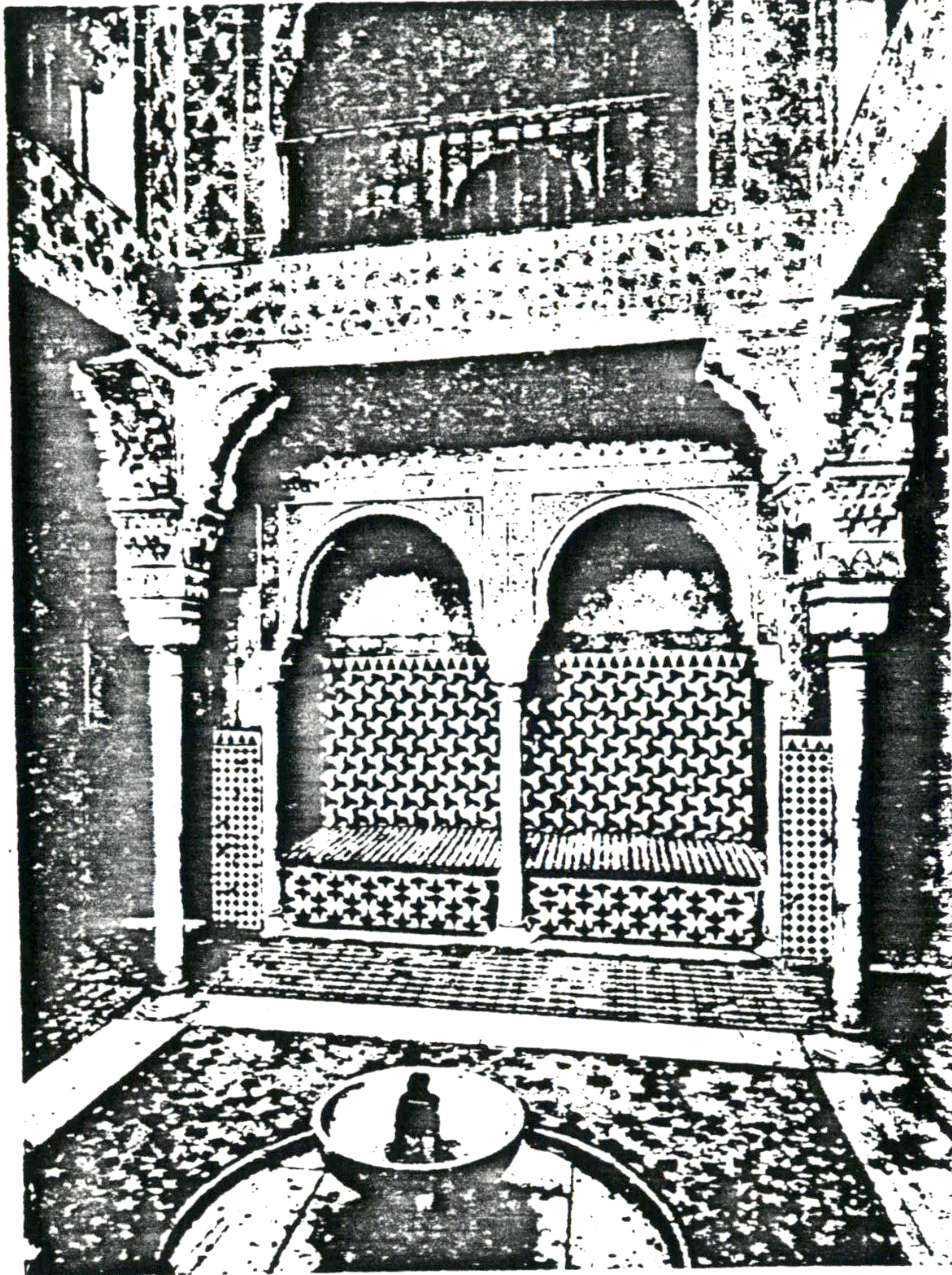
The importance of the issue of value in relationship to the subject of order is based on the assumption that beauty, harmony, etc., are not subjective, but are objective substantive characteristics of the physical world. The fact that people can reach a significant level of agreement in judging the beauty or ugliness of an object, or any component of the physical environment, implies that there exists a

common scale of values that we each share and that we use to judge the goodness of the physical world. The non-quantifiable, intuitive character of beauty and likability does not diminish their reality as phenomena, nor does it make them any less significant as subjects for serious study. Few people would discount the beauty of the Sierra Nevada, the town of Sienna, or the cathedral of Notre Dame in Paris. We each share a deeply held understanding of value that guides our response to the physical world, both natural and manmade. Furthermore, value resides in the objects of the world, including buildings, and does not rely on the perception of each individual. Goodness and beauty are attributes of the physical substance of any thing.

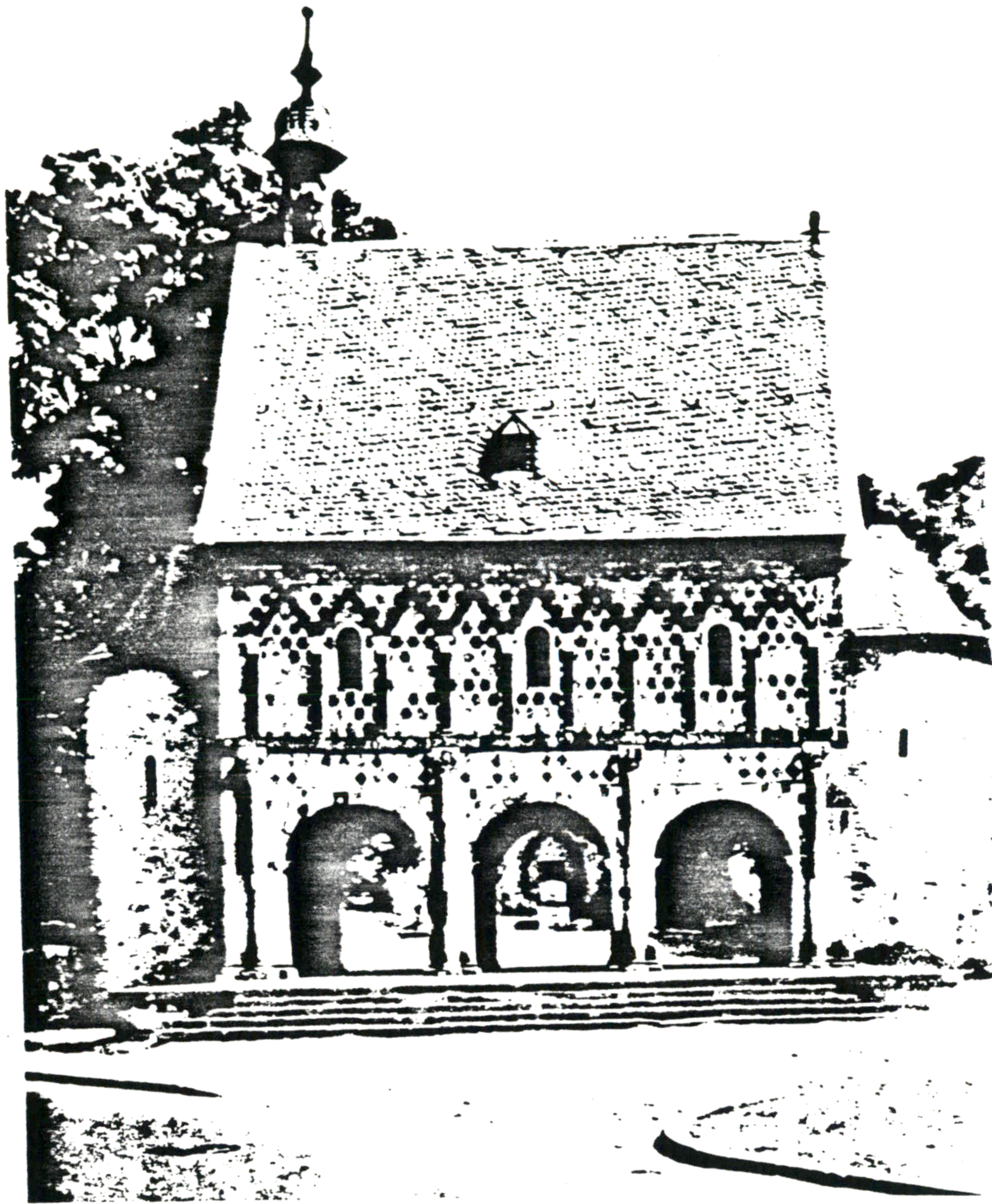
The physical composition or form of beautiful, ordered buildings is defined by certain geometric properties and a specific geometric structure. In natural objects and organisms, and in the beautiful artifacts, buildings, and cities that men have made, a specific and objective physical geometry is common to all of them. This geometry has several properties, a few of which are illustrated below in pictures:



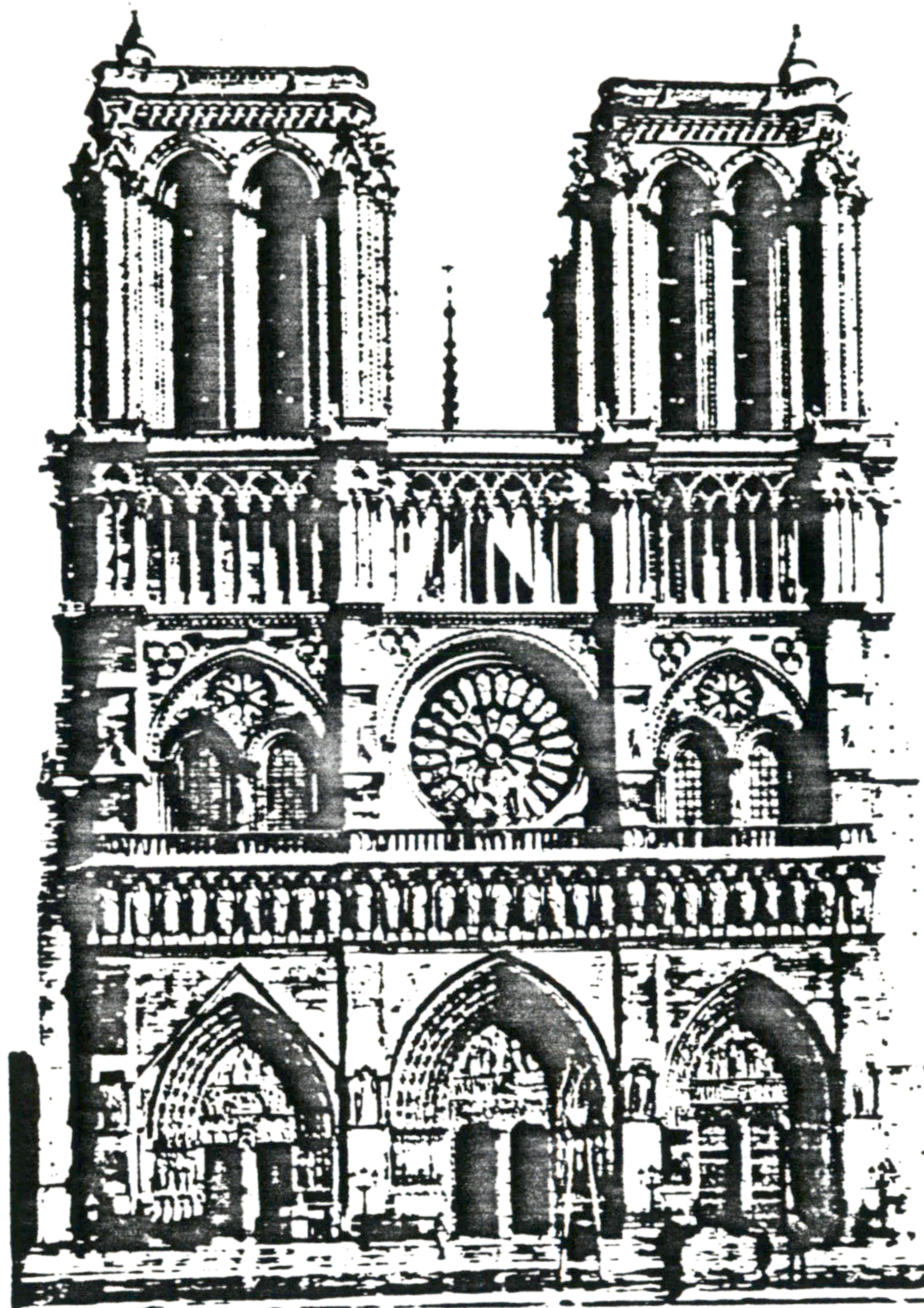
POSITIVE-NEGATIVE



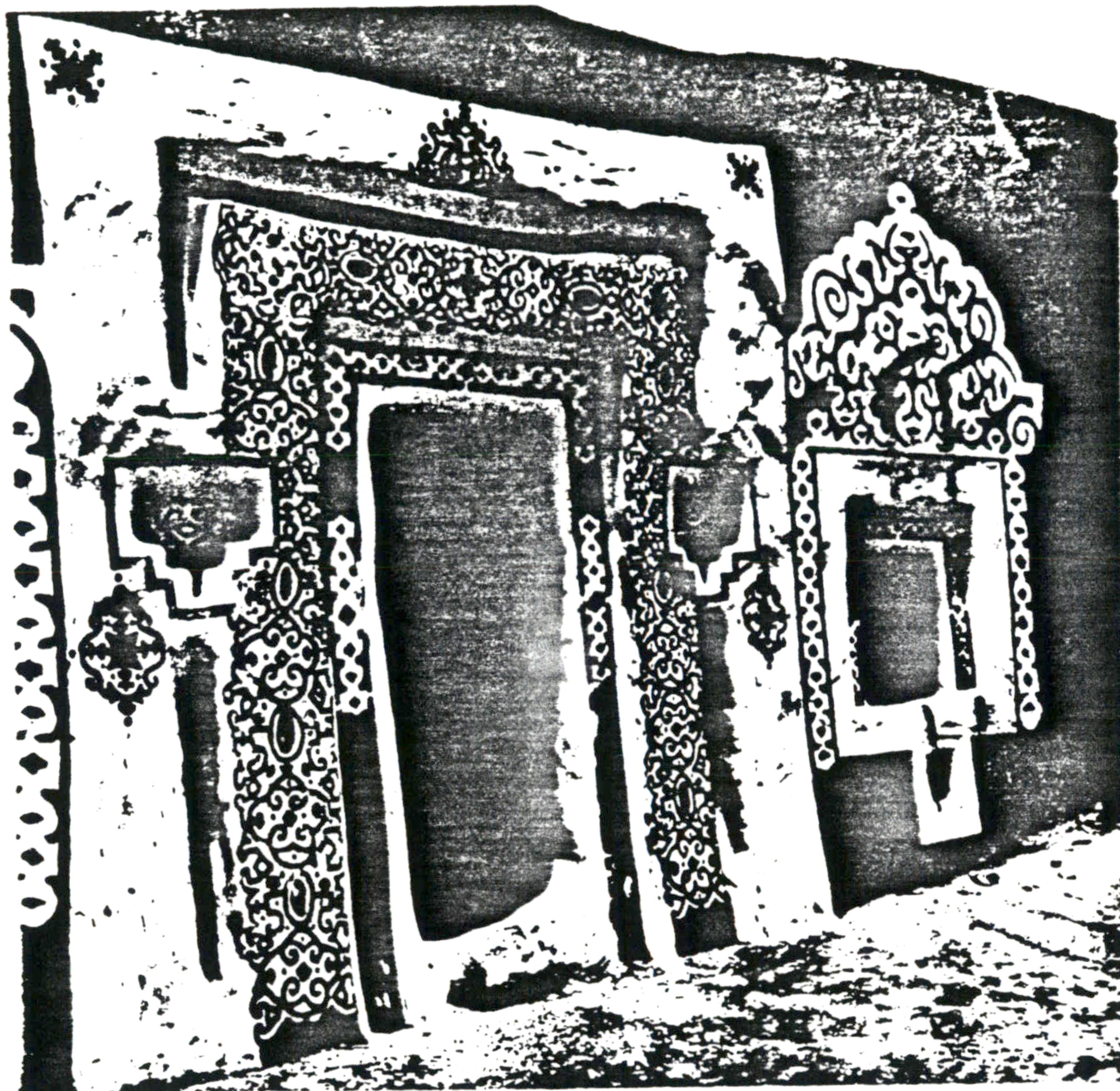
LOCAL SYMMETRIES



ALTERNATING REPETITION

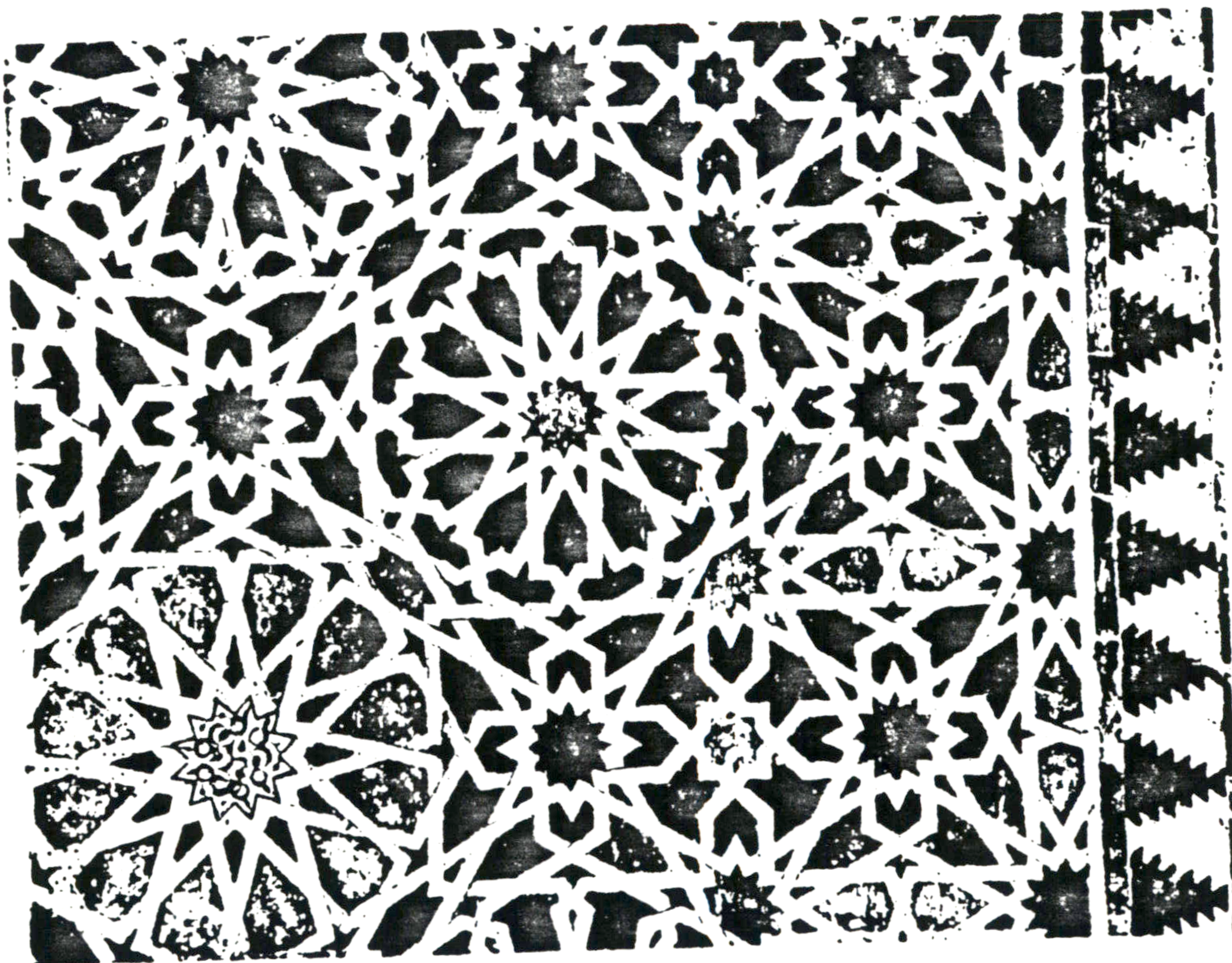


LEVELS OF SCALE



BOUNDARIES AND ROUGHNESS

Additionally, beautiful buildings share a specific geometric structure. Buildings in which this structure is found are composed of a web of discrete entities, or centers. Each of these centers is a distinct nameable thing, and yet cannot be described as an isolated object. To define one center requires the definition of the centers of which it is formed, and the centers it helps to form. Each center is an inseparable part of a hierarchical network or structure of both larger and smaller centers. Thus, any building which is a center is itself a structure of centers, and is a component center of the structure of its larger context.



The geometry of this decoration from the Alhambra is, in two dimensions, a structure of centers. At first glance

one immediately notices the few largest stars, and on further examination finds layer after layer of smaller structure: diamonds, squares, grids of smaller stars, etc. The number of levels of centers in the pattern is extremely large, and each layer works to define or extend several others. The result of this complicated order is a simple and distinct global structure made up of a seemingly endless variety of substructures, each of which is beautiful and whole within itself.

Geometry and value are inseparable aspects of any operational process for the formation of centers, and thus, in making a building with this sort of order, the builder follows a procedure in which its form is constantly made more beautiful, at each step from the establishment of its global form to each small detail of construction. The centering process has basically one rule: every step taken in the creation of a building or complex of buildings transforms, in a positive way, the network of centers in the situation, through either the formation of new centers which extend the structure, or through the enhancement of centers that already exist in the context. Each modification is, then, a "structure preserving transformation." To create a building that is both functionally and geometrically correct, the builder must be cognizant of the structure present in the situation in which he is going to build; both the centers that are present on the site and its surrounding context,

and the centers which are held in his mind, and that are specific to the project at hand.

One cannot create beautiful buildings, though, through simple mechanical use of these geometric properties and processes. Structure preserving transformations require as well that a judgment is made about the goodness of every step in the process of creating centers. Each step not only manipulates the physical geometry of the situation, but also judges its ability to preserve and enhance the beauty of the structure of centers that is evolving in a given project. These decisions regarding value are recognized as an integral part of the process of creating centers.

The design of the Eishin School's site plan was an attempt to create a configuration of buildings, paths, and roads which have order at the largest or global level of scale. In this report, I will describe the ways in which the Eishin School project has attempted to make the centering process into an explicit, workable tool for the design of the overall structure for a complex of buildings.

Work on the project started with the assumption that in the design of any new building, or complex of buildings, one must work hierarchically, establishing the largest structural order first, then differentiating that structure by the addition of smaller levels in the hierarchy. At any moment in this process the project is in a sense complete. This process of differentiation is analogous to the development

of a complex organism from a single cell. Growth occurs by a process of division rather than by addition, and the organism is at any moment complete and whole, though not necessarily fully developed and mature.

In the design of a complex of buildings, like the Eishin School, the first task is to define physically the few largest spatial centers which encompass the entire project, and which define its global structure. This structure can be differentiated, then, by its division into progressively smaller centers until the plan of the project is complete.

This report will describe the work done to derive and develop the global structure of the Eishin School's new campus.

THE EISHIN SCHOOL



In creating order at the largest level in a complex of buildings, one must resolve two independent structures of centers: the structure of the site and its context, and the structure intrinsic to the project itself. Ideally, the process of site design creates a single composition of centers encompassing both structures. The buildings, roads, outdoor spaces, and paths required by the internal structure of the project are modified by, and modify, the contextual structure of the site, which consists of the geometry of the land's form, vegetation, existing buildings, and roads. In beautiful site plans, neither structure's integrity is compromised by its modification to accommodate the other; both are merged together to form an entirely new structure.

Although both are composed of centers, the two types of structure are different in origin. The internal structure begins as a verbal description or mental picture of the overall form and arrangement of elements needed by a specific building project. The contextual structure, on the other hand, is the existing structure of spatial elements on the site.

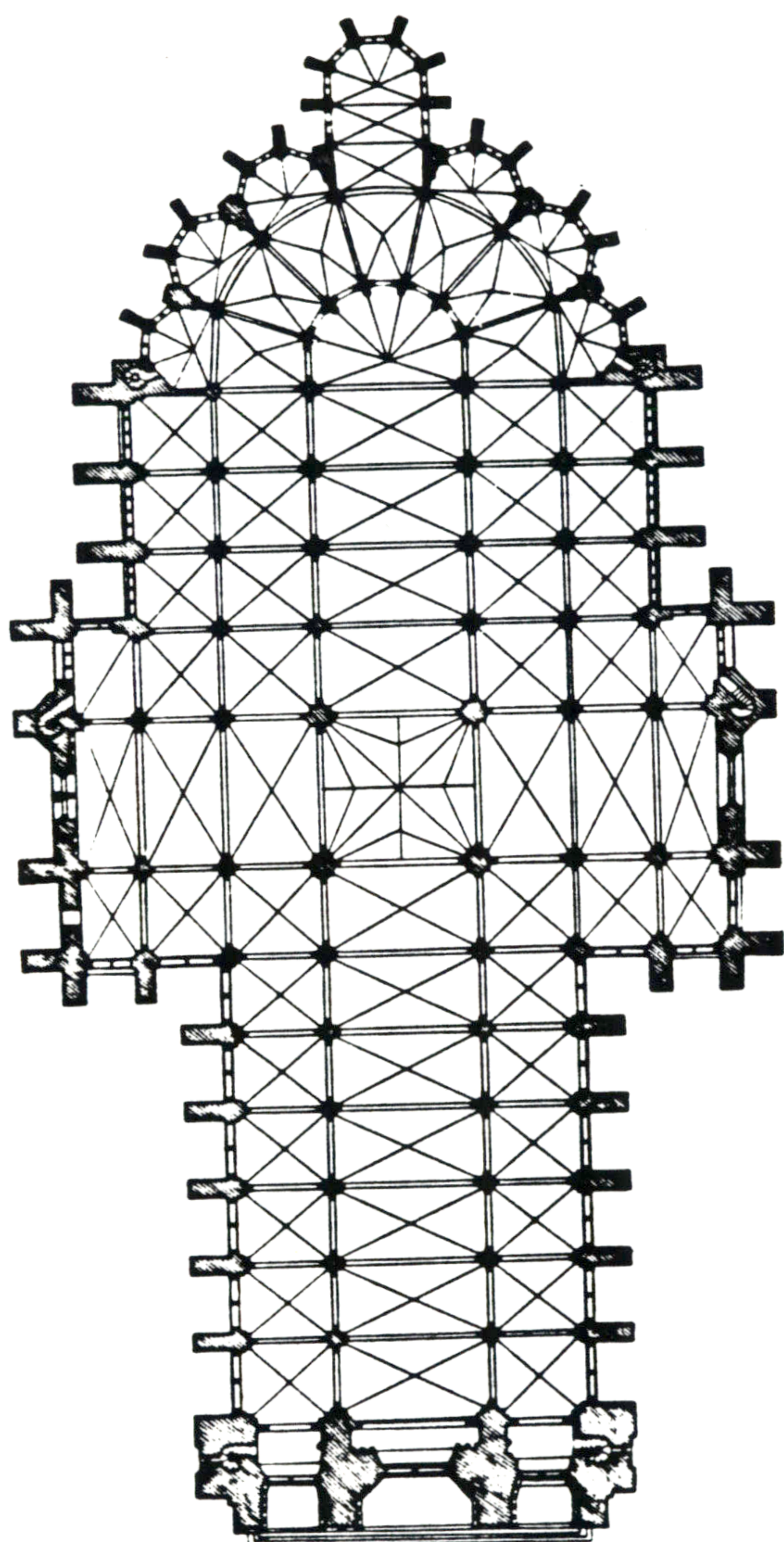
The internal structure of a project is the organization of centers needed by the project itself, by both functional and human necessity, which can be described before the site

is known and before the process of design has begun. It is the geometry of physical entities needed by the people who will inhabit and use the place on completion. The internal structure is not simply a programmatic statement defining the types and dimensions of rooms and buildings. It instead defines the tangible, material reality of the network of centers required by the project, and its interconnections at all levels of scale.

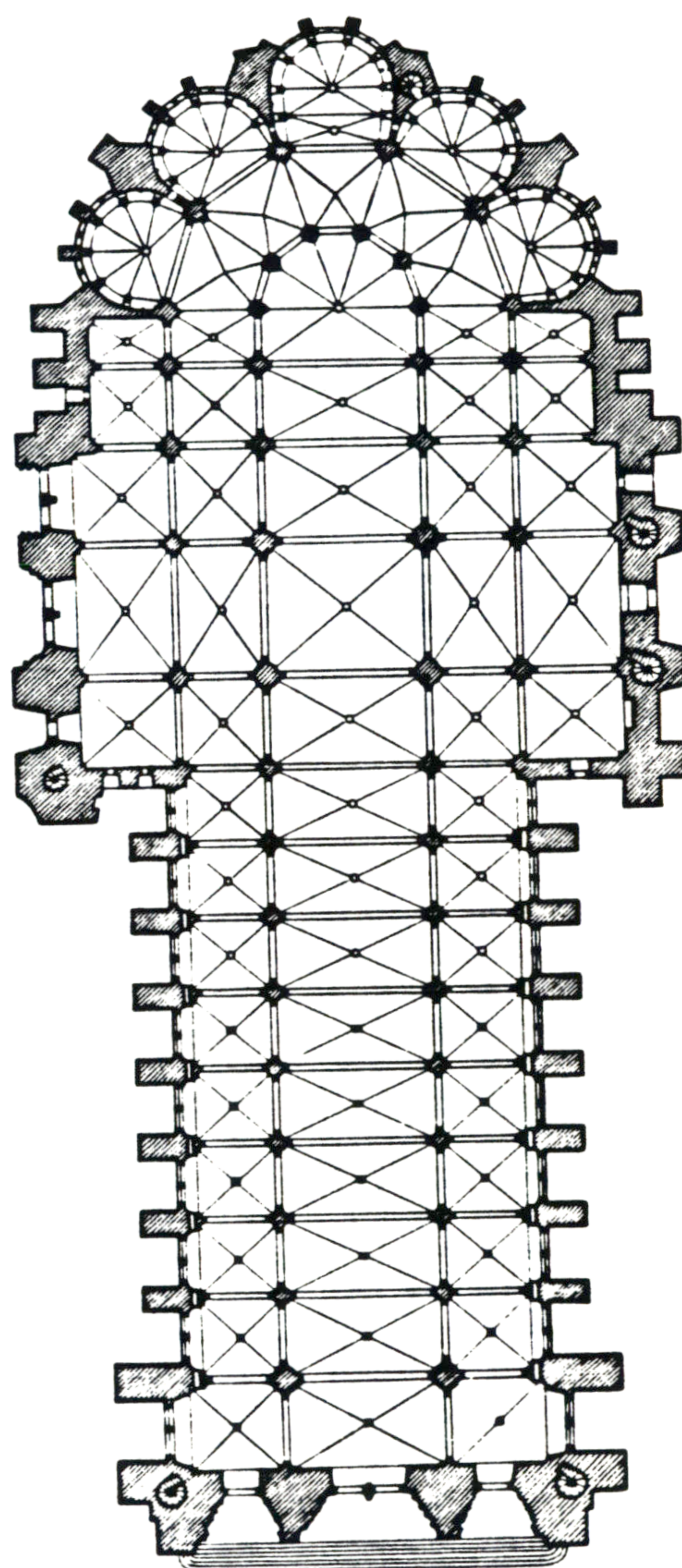
The cathedrals of the Gothic period in northern Europe are good examples of a type of building that used a clearly defined internal structure in their creation. As a class, these churches share in common a number of centers; each has a nave with its long axis oriented east-west, two side aisles slightly narrower and parallel to the nave, a transept crossing perpendicular to the nave at its east end, an altar area extending the nave beyond the transept, an ambulatory connecting the two side aisles and surrounding the altar area, an odd number of small chapels radiating from the ambulatory, and an elaborate west facade containing the building's ceremonial entrance. Each entity listed is not an isolated physical space, but is a center necessarily defined by the structure of which it is an integral part. Every cathedral built with this structure of centers is similar to the others and is recognizable as belonging to the same class of buildings, but is individually different in response to the context in which it was created. The

internal structure of these churches was evidently shared by their various builders, and was, in all likelihood, known before the process of construction was begun.

Amiens Cathedral



Reims Cathedral



Plans for two Gothic cathedrals derived from the same internal structure.

In the site plan for a complex of buildings such as the Eishin School, the internal structure of the project can be as clearly defined as that of the Gothic cathedrals. Internal structure is not confined to describing only the composition of spatial divisions and rooms within a single building; it can also specify the relationships between individual buildings and groups of buildings in larger projects. The structure of a building complex is derived from the human needs that require that it be built as a single entity rather than as a random scattering of unrelated buildings. The fact that a number of buildings must be built together implies that they have some integrity and cohesion as a group. A project's internal structure at the global level is a description of its largest centers, which have a specific geometry that can be described with very little knowledge of the site on which it will be built.

The internal structure of a complex of buildings only describes an archetypal sort of order and does not specify a particular design solution. The context of the site influences the final form that a building project takes. The site introduces an existing structure of centers that interacts with the project's internal geometry to produce a new structure that embodies both.

The structure of the context is the organization of realized and potential centers that exist on the site, and

that together give the site its geometric organization and order. The site for a building project presents a structure of centers which has a specific geometric form in itself. Its order is the result of various forces, including the nature of the man-made fabric (i.e., urban or rural), the vegetation (i.e., desert or forest), and the topography of the land (i.e., mountain or plain). Together these forces make up the geometry of a site, and have an influence on the form of the landscape at various levels. The man-made fabric of a site's context, for instance, includes not only its large-scale structure--the system of roads and streets, as well as buildings, that surround it--but also can include individual buildings and roads existing on the site itself, or even informal paths that cross from one side to the other. The man-made context in which a site is contained represents, physically, the human activities that take place there.

Topography as well defines the form of a building site. The lay of a piece of land, and its surrounding context, contribute to its geometric, physical form. At the largest level, the geological make-up of the area describes the general nature of the site: desert, coastal, riverine, mountainous, plateau, valley, or plain. And at smaller levels, the specific topography of a particular piece of land helps to describe its spatial centers--hills, small valleys, streams, etc.

The ecological system, which determines the type of

vegetation, also contributes to the nature of the site's geometry. Take, for example, a piece of land in a forest. The fact that it sits in a forest specifies something about the site's overall form as a center. Its structure is far different from that of a piece of land with similar topography and man-made context located in, say, a desert. And at a smaller level of scale, the vegetation can define the structure of spatial divisions within a site's boundaries. For example, the trees on the forested site can help to define the shape of a meadow.

These forces combine to form the contextual structure of a building site. The man-made context, the vegetation, and the topography work together to create the physical form that every site has. Their interaction establishes a network of centers, tangible spatial entities, which give a site its special and unique character.

The aim of a site design process that is intended to create order at the global level, like the Eishin School project, is to bring these internal and contextual structures into a unified state, forming a new and independent structure, without disrupting their individual integrity. In designing a site plan, the primary task is to maintain the integrity of both the internal and contextual structures as they merge together during its creation. Neither is allowed to dominate the other; rather, their interaction leads to a state of equilibrium in which they

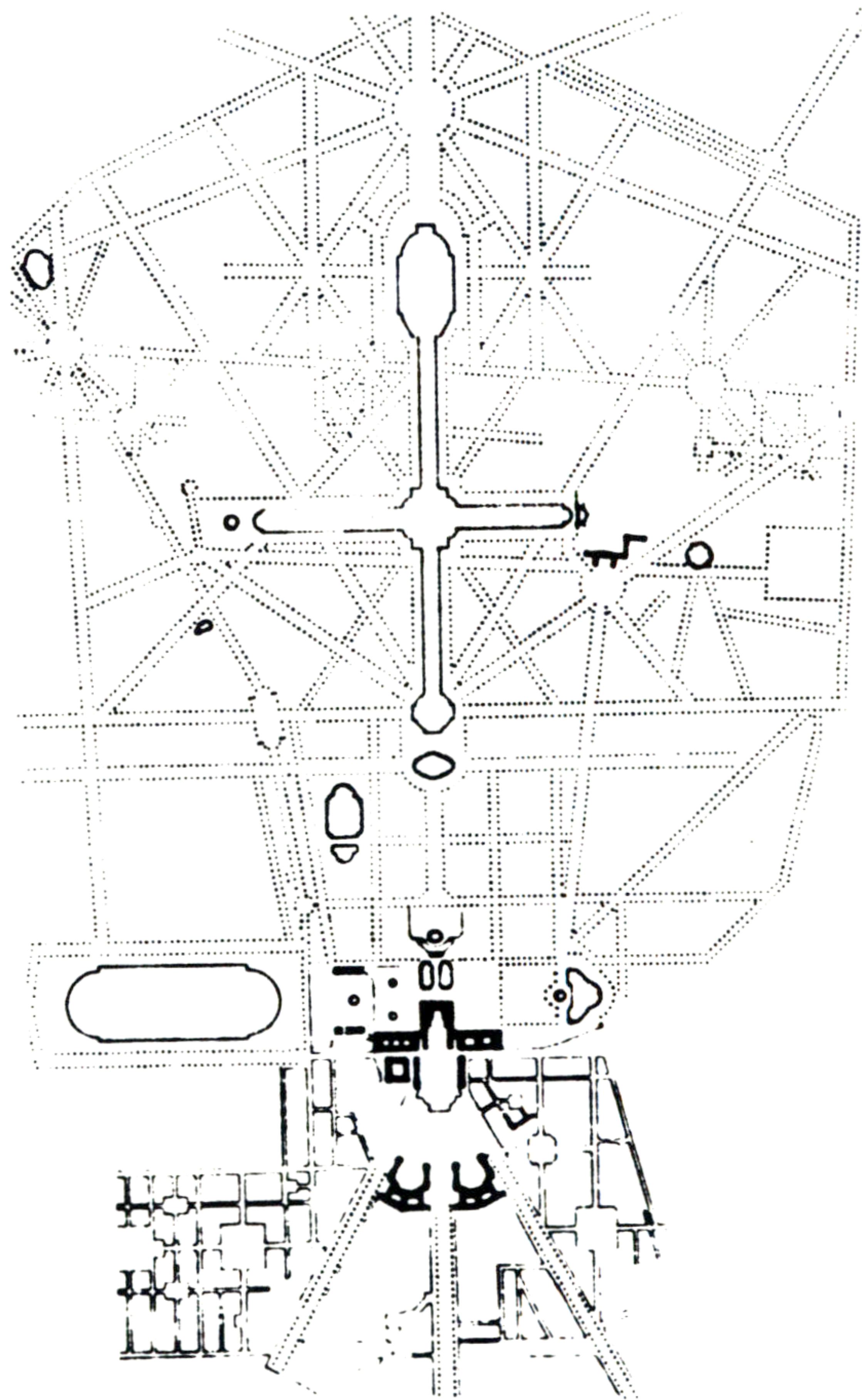
form a single unified entity. This equilibrium structure is like the perceived violet color one sees when looking at a mosaic of red and blue tiles. The integrity of the color of the individual tiles remains discernible, but the resultant of the field is a unique and independent third color.

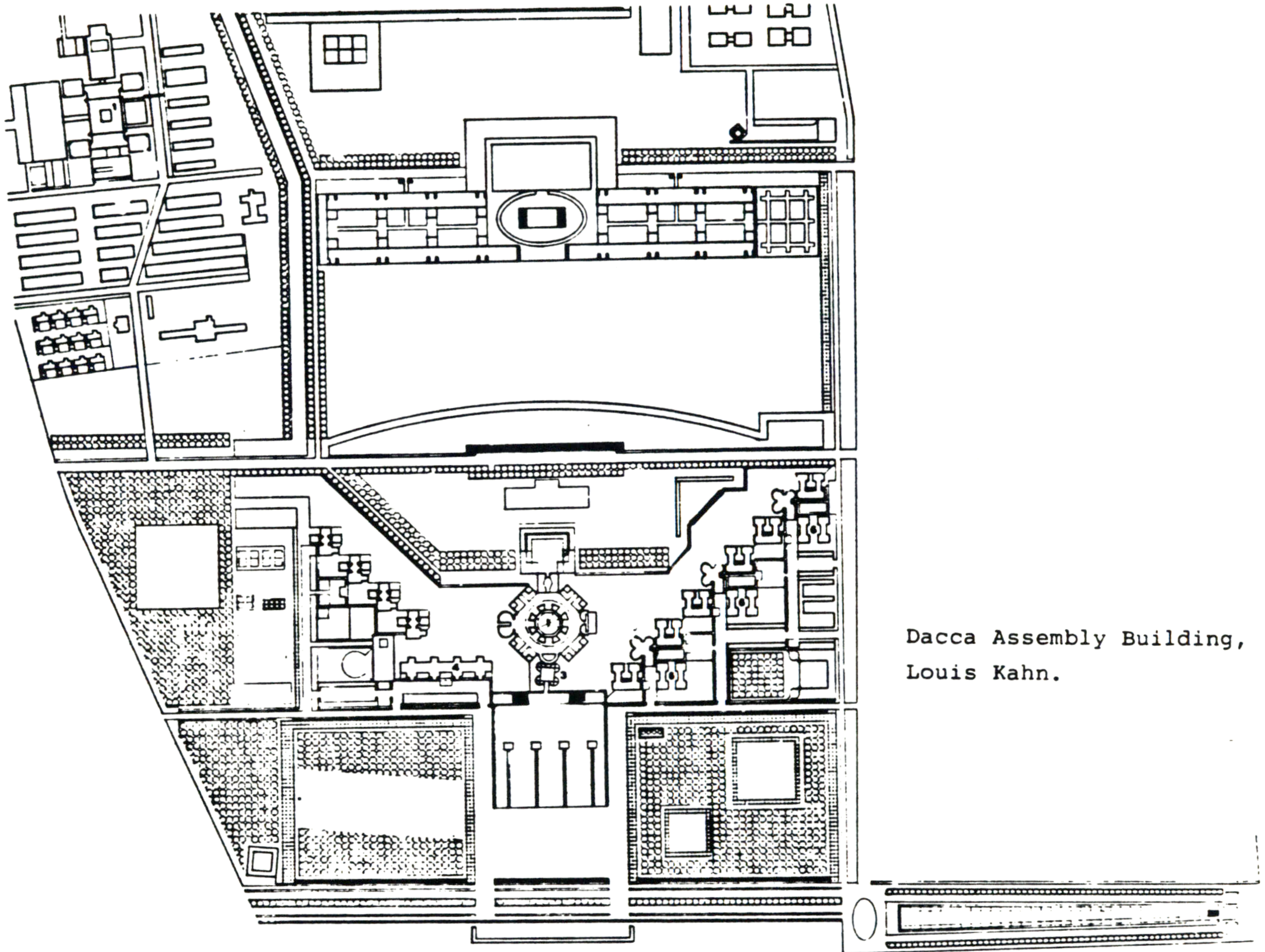
The equilibrium state can be described as either the physical realization of the internal structure, or the completion and repair of the contextual structure. The organization intrinsic to the building project becomes more complex and differentiated as it is modified and physically altered by the demands of the context. And likewise, the contextual structure becomes filled out and completed by the buildings, paths, and outdoor spaces of the internal structure. Both are altered, but not compromised.

Unfortunately, the work of architecture usually allows the internal structure of the project to dominate the global form of its buildings and complexes of buildings. Although most architects concern themselves with the structure of the site, they are primarily concerned with the project's internal geometry, most often an oversimplified geometric scheme. The site is considered secondarily, as constraint on the project. The organization of buildings is modified by the site, and the site may be improved by the addition of buildings, but efforts to resolve them into a unified whole are cursory at best. Site planning for a complex of buildings is essentially the placement of a pre-defined geometry of

buildings onto a piece of land, rather than the creation of an ordered composition from the resolution of the structure of the project with that of the site. The current approach, which allows a pre-defined scheme for the project to control the site design process, leads to violation of the centers on the site and to a disruption of the structure of the context.

Versailles

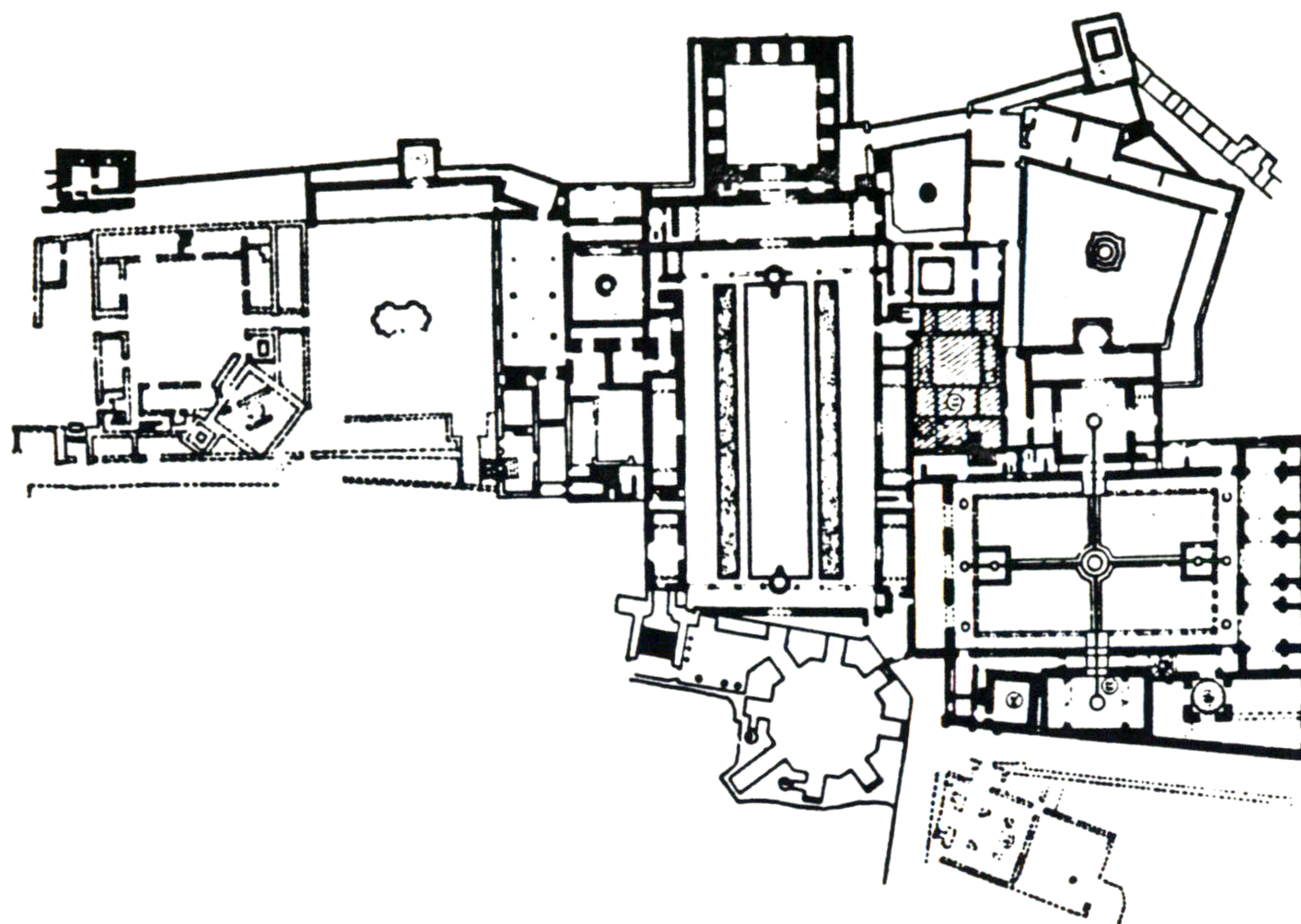




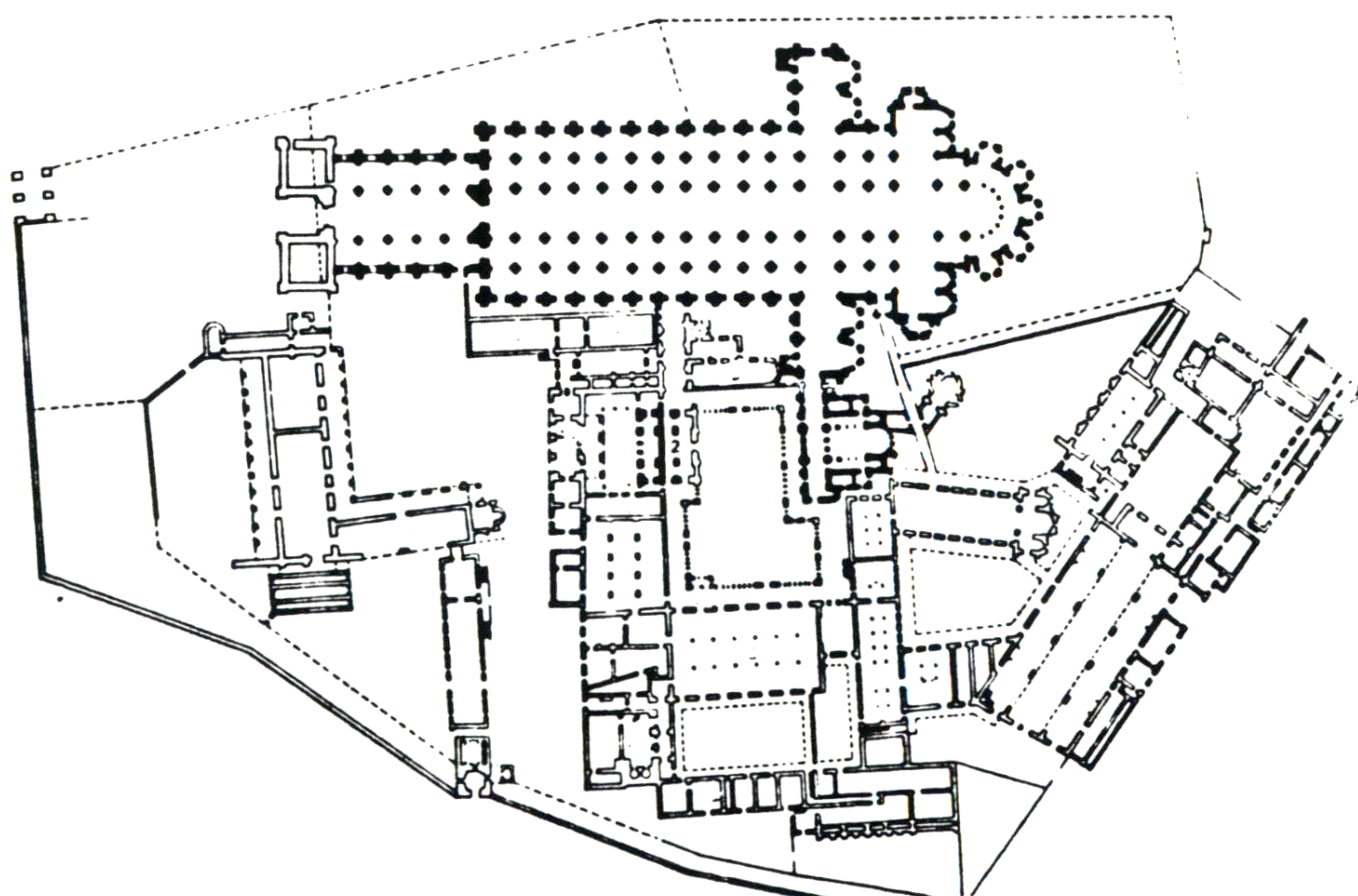
Dacca Assembly Building,
Louis Kahn.

Site plan in which a
geometric scheme dominates.

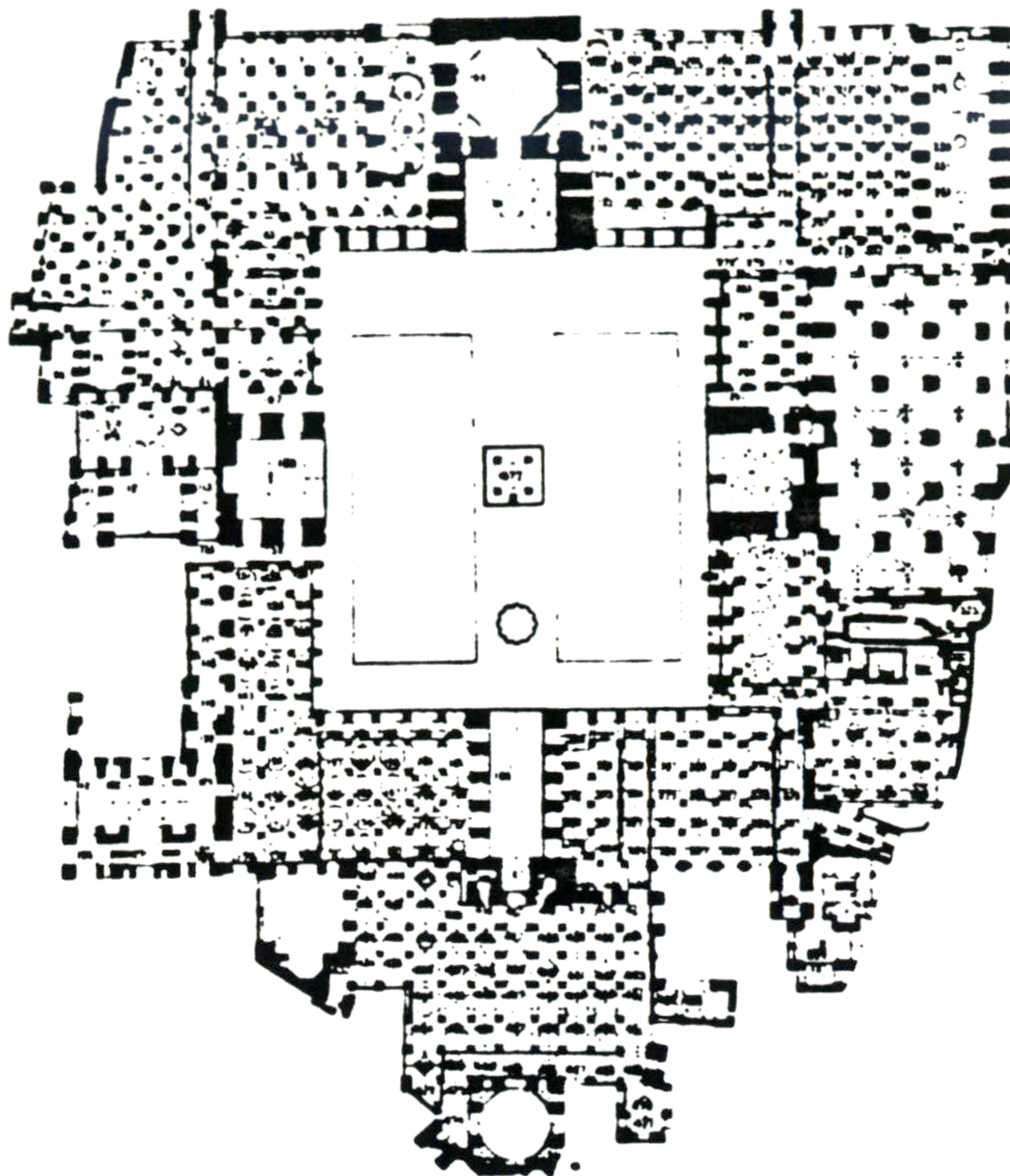
Instead of trying to explain verbally the quality of site plans with equilibrium of internal and contextual structures, I will present a few examples which demonstrate the beauty of geometry achieved when the two structural systems are resolved.



The Alhambra



Cluny III



The difference in the intrinsic beauty of building complexes which, on the one hand, have achieved a state of resolution between internal and contextual structures, and those, on the other hand, that are dominated by the project's internal geometry, is apparent in the geometry of their plans. Over-reliance on the structure of the project tends to create diagrammatic forms based on pre-conceived geometrical schemes, or on artificially contrived arrangements of elements; whereas a site plan, which arises from the creation of harmony between internal and contextual structures, has a more relaxed and informal geometry that displays the integrity of both structural systems.

During the work on the Eishin School project, the underlying goal has been to achieve such an equilibrium state for the school's new campus.

Work on the project had two parts, which will be described in the next few pages. The first part was done as an academic studio exercise at the University of California, Berkeley, and the second part was done as an experimental architectural project in the Center for Environmental Structure.

Both the academic and experimental phases of work on the Eishin School project are presented because they are similar in the manner in which they created the equilibrium state resolving their internal and contextual structures. The main value of discussing these projects is to illustrate the problems faced in designing the global structure for a complex of buildings.

The studio project was a simulation of the real project, simplified to allow the problem to be adequately handled within the constraints of time imposed by the academic setting. The general programmatic description of the school, used in the exercise, was the same as that of the real project. The specific detail of the program, though, was developed individually by each student, and a site in the Bay Area was chosen for the layout of the proposed campuses.

In general, the work done in the Center for Environmental Structure for the actual design of the Eishin School's site plan followed a similar process to that used for the studio project. The most important difference was the greater depth of detail that the actual project required in dealing

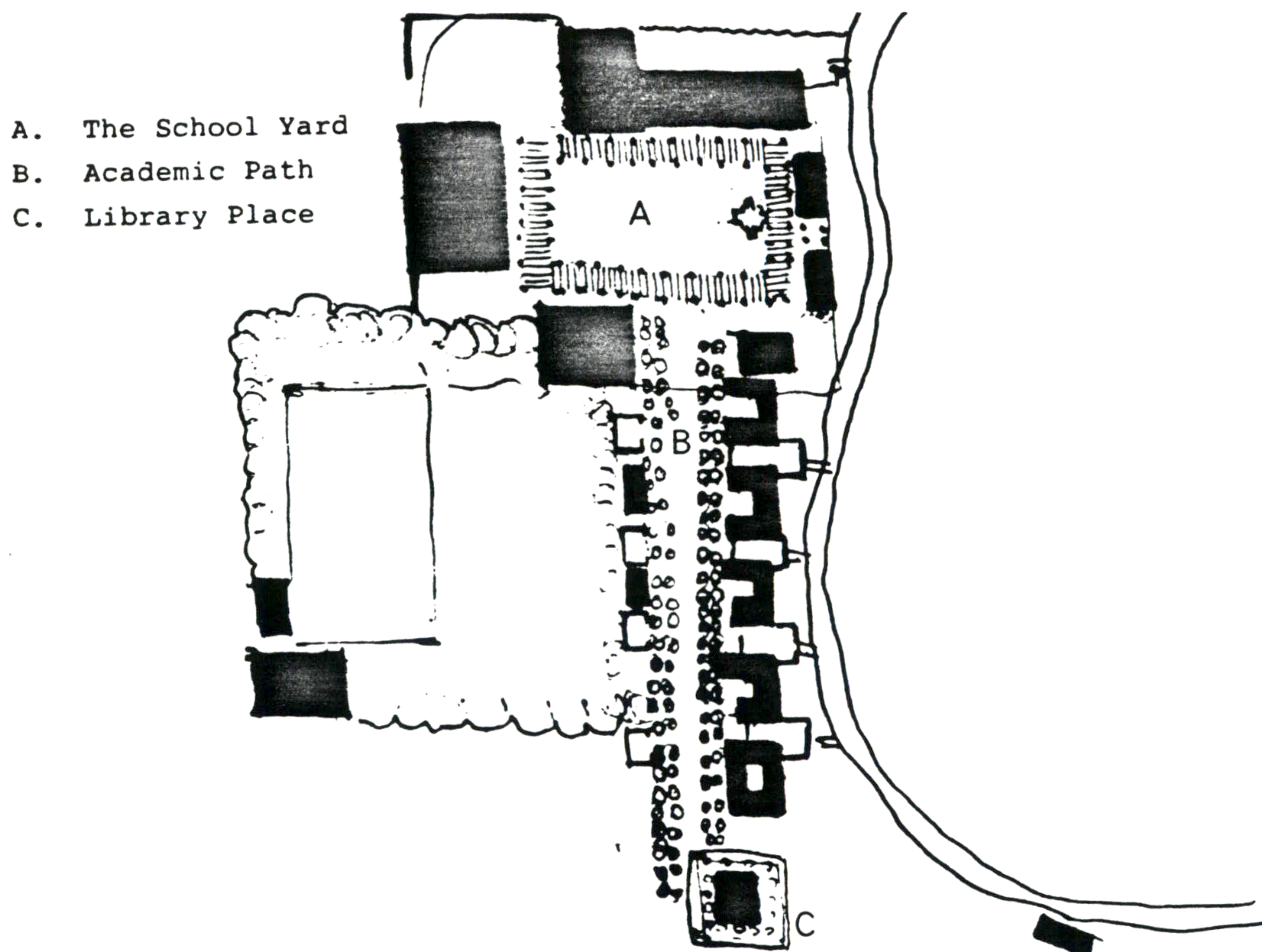
with the complex needs of real clients and users.

The major steps taken to deal with the resolution of the internal and contextual structures were the same for both the academic and actual phase of work on the project. The first step was to define the school's internal structure verbally. This was accomplished by the writing of a pattern language for the actual project, and a list of "entities" for the studio project. The second step was to study the site and to understand its structure. The third step was the actual creation of the equilibrium structure. A good global structure was produced for the site plans, but was difficult to achieve since the manner by which the internal structure and the site were to interact was not clearly understood.

The internal structure at the global level for both the academic and actual projects was described in writing before the process of design was begun. The problem of pre-defining and clarifying the internal structure of the academic project was solved by the construction of a list of "entities" which defined the various centers required by the school, and their physical relationship in space. (Appendix One) Their development was based on hypothetical information about the human life of the institution, and the nature of the school and how it would operate. Each entity described, in written form, a tangible physical component necessary to the school that resolved a variety of functional needs, and embodied the

emotional content one would naturally associate with it. The purpose for writing the list of entities was to establish a clear picture of the form of the internal structure of the whole campus at the global level of scale. The mental image created by the entities had a sort of archetypal form since the site and context were considered very little in its development. The list of entities was intended to establish a definition of buildings, road, paths, and outdoor spaces required by the specific needs of the project, and their distribution and organization. It was not meant to define a specific formal geometric solution, only to provide a clear archetypal image of what the school could be like.

A diagram of the internal structure of the school as defined by the list of entities.



The internal structure for the actual design of the Eishin School's campus was defined by a pattern language which described the elements needed by the school, and their physical and spatial interrelationships. The patterns, similar to the entities of the studio project, explicitly defined the structure of centers required by the new campus.

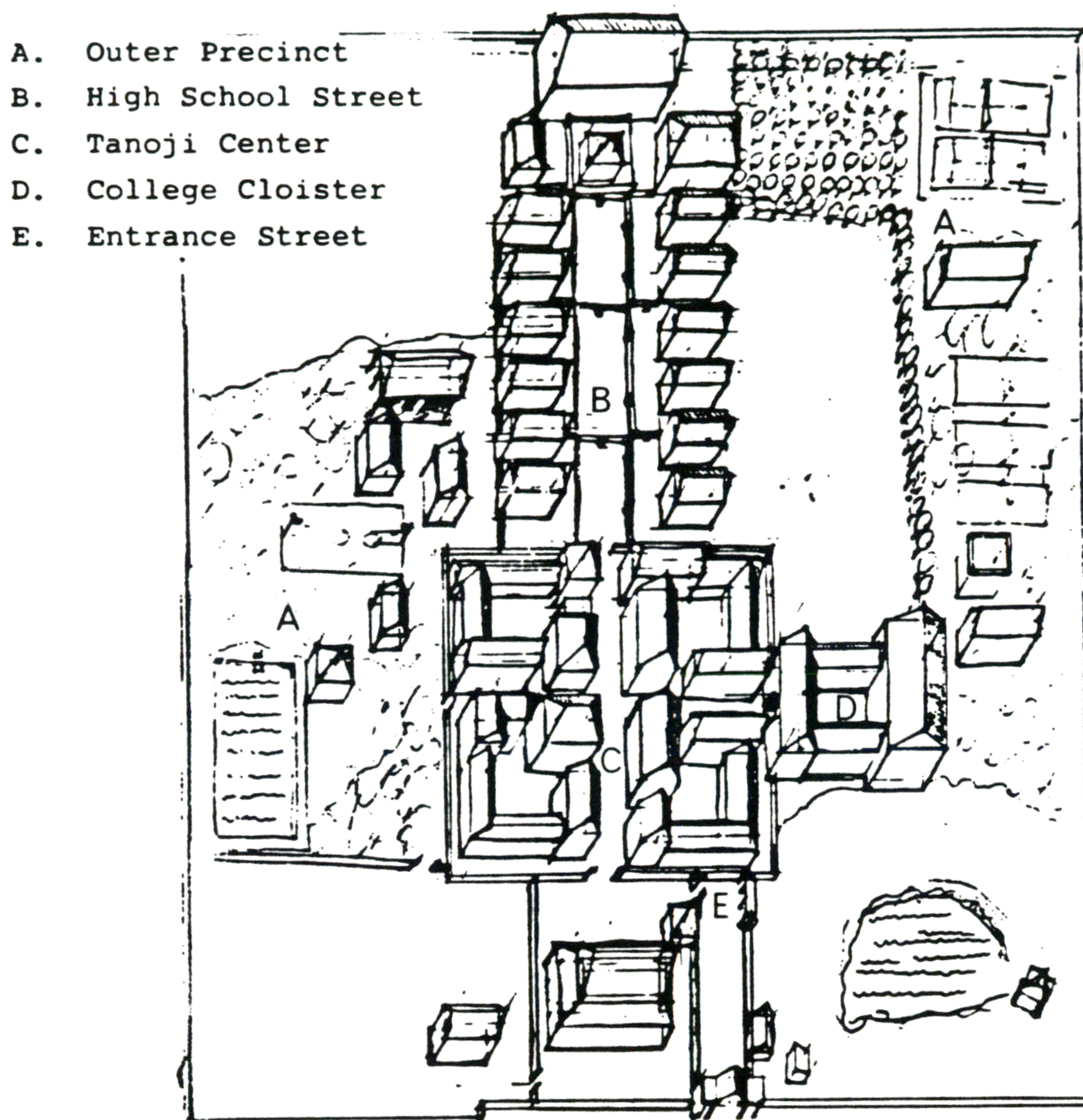
The patterns were derived from interviews, and discussions with the people at the existing school, who initiated the formulation of specific patterns, and helped to clarify the fit between their needs and the spatial configurations described to resolve them. Extensive interviews were carried out in which their wishes for the new campus were discussed, and information about the character and functioning of the institution was gathered by directly observing the workings of the existing high school. This information formed the basis for the description of the various physical elements required by the new school. Centers were described that gave form to the necessities of the school as stated by the students and faculty, and as observed by the architects.

(Appendix Two)

The description of the school given by the pattern language was complete at every level of scale relevant to the campus's overall structure. Buildings, for example, were described only in enough detail to provide a clear picture of how they related to the campus as a whole. The global patterns, consequently, had a critically important role in

the structure of the pattern language and in the image it formed.

A small number of patterns were written that described the largest centers needed for the new campus. They defined the most important objects one would find in the school's new site plan. At the very largest level were two patterns, the Inner Precinct and the Outer Precinct. The Inner Precinct was described as a dense conglomeration of buildings, most of the campus's built area, surrounded by the Outer Precinct, which contained, in a loose organization, the sports fields, gardens, a lake, and scattered buildings. The Inner Precinct was to be made up of five centers: the Entrance Street, the Public Yard, the Tanoji Center, the High School Street, and the College Cloister. These in turn were made up of smaller centers, and so on. For the purpose of designing the campus's new site plan, these seven patterns established the global form of the school's internal structure.



A sketch of the internal structure of the Eishin School,
 as defined by its pattern language.

The contextual structure was studied indirectly in both cases by making a series of sketch site plans that attempted to assign centers of the internal structure to centers existing on the site. Once the internal structures were completed, the work focused on trying to understand the structure of the site and how it would interact with the new

campuses. The analyses of the sites were done intuitively and were made explicit only by a series of sketches that located the various centers of the campus's structure on the piece of land. These drawings attempted to compose the various elements of the internal structures in response to the context, but failed to explicitly define the centers on the site as an independent structure. No effort was made to clearly define the contextual structure as was made in describing the school's internal structure, during both the academic and actual work on the project. Instead, the work turned almost immediately to fitting the pre-defined elements of the school onto the site.

The actual work of creating the global structure for the school in both phases of the project at first failed. When the first attempt was made to actually lay out the campus for the academic exercise, the elements of the internal structure were taken exactly as defined by the entities and were forced onto the site. The result was a contorted composition, dominated by the individual buildings and their necessary organization. The site was not ignored, but was used only as a neutral and inactive location for the various buildings and outdoor spaces. Both the internal and contextual structures were changed from their original forms by the scheme, but the changes were not directed toward making the compositions more beautiful. Individually, the relationship of the buildings and outdoor spaces to their immediate

contexts was pleasant, but the global order of the plan was ignored and not taken seriously.

Similarly, during the work on the actual project, the first sketches of site plans took elements of the school's internal structure, exactly as defined by the pattern language, and placed them on the site with only cursory influence from the context. The compositions produced were not good for two reasons. First, the site was not yet clearly understood, and was being analyzed as the drawings were made. Although the site plans were drawn in response to various isolated features and problems of the site, they did not respond to the context as a unified network of centers. The second reason was the result of the assumption that determined how the patterns were interpreted. In the early stages of work, the global centers were drawn in the sketches as rigid geometric configurations representing the simplest interpretation of the patterns, and were not allowed to be modified in response to the site.

The later work was more successful in reaching an equilibrium state in which the internal and contextual structures were fitted together and resolved into a unified composition. Two differences in the procedure of doing the work, during both parts of the project, helped to ensure its success. First, a model of the site was used for the studies. And second, a decision was made which allowed the internal

structure to be less rigidly interpreted and more accepting of influence from the site.

A major problem that caused the first efforts to fail was the uncompromising manner in which the internal structures were interpreted. The interpretation of the entities for the academic work was changed before making the final site plan so that, instead of dictating the geometry of a specific site plan configuration, they served as a guide to the type and arrangement of centers needed by the school. The configuration created during this attempt to develop an equilibrium structure for the campus bore little geometrical resemblance to the archetypal form described by the list of entities. Changing the way that the entities were used allowed the structure of the site to have its justifiably influential role in shaping the form of the plan as it evolved. The internal structure was geometrically modified, and the arrangement and distribution of its centers was given a concrete form by the structure of the site. The contextual structure, which was understood intuitively by spending hours on the site while making the earlier sketches, played an important part in the establishment of the character of the plan.

And likewise, in the work on the actual Eishin School, after several unsuccessful attempts to draw site plans and to visualize the components of the school's internal structure

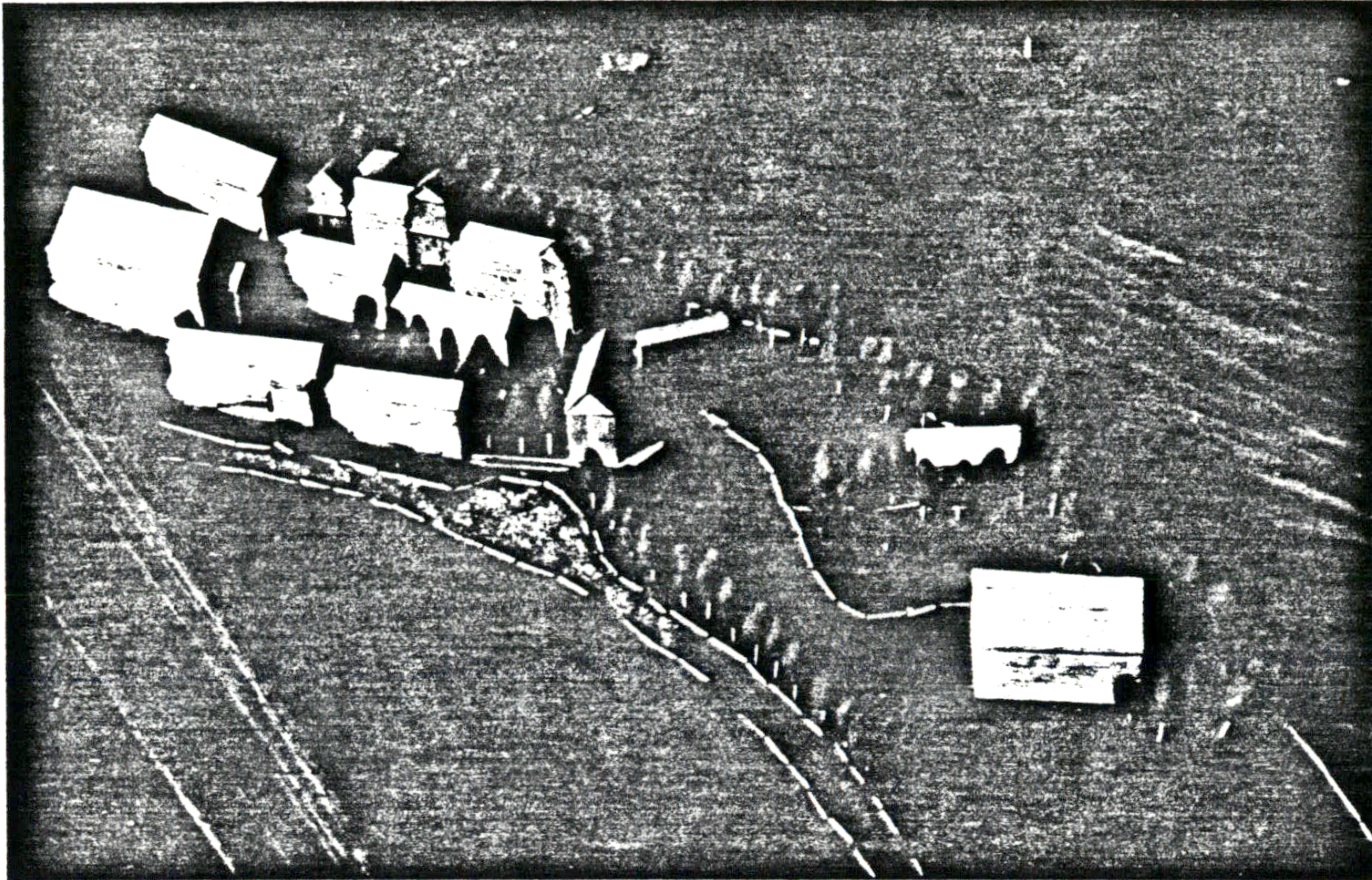
on the site, a tacit decision was made which allowed the definition of the global patterns to be interpreted less precisely. This permitted the site and context to have a more substantial influence on the configuration of the campus's form. Each of the global patterns in the equilibrium structure was altered in shape and dimension by its interaction with the structure of the context, but the final configuration of the school's plan was substantially the same as that prescribed by the pattern language. None of the global patterns was altered in character or purpose in its responsibility to the whole of the campus.

A second problem was the rather abstract, diagrammatic nature of the site drawings that were used for the first studies. For the later work, study models were used that were less abstract than the sketched site plans, and that gave a more accurate representation of the physical reality of the campus's large-scale organization. The model built for the studio work allowed the site to be visualized at a glance, and helped the site plan to be seen and understood more clearly as a coherent, singular object as it evolved. A problem with designing a large project such as this is the difficulty in physically seeing the whole arrangement on the site as a single entity. In the first attempt to lay out the campus, each center was located without fully understanding its impact on the rest of the configuration. Building the

model helped to alleviate this problem by providing a three-dimensional sketch of the entire campus that could be adjusted quickly as the internal and contextual structures were fitted together.

Instead of being preoccupied with every entity at once, the model allowed each to be individually expressed in the situation as it existed. The centers, defined by the list of entities, were taken one at a time and made as beautiful as possible in the context of both the site and the centers of the school which had been previously established. The process of creating the equilibrium structure was roughly hierarchical so that the largest or global entities came first, followed by the next most important entities, and so on. The global entities of the school were laid out first on the model, and had only to respond to the structure of the context. Each of these three entities was placed to respond to specific centers of the site. The School Yard was located in a large meadow at the top of the slope. The Library Place was laid out on a small knoll, the most important center on the site. And the Academic Path was placed so that it went up the slope in a subtle crease in the land, parallel to the stream at the south side of the site. These decisions were made in an almost naive way, without concern for how the smaller entities could be resolved within the structure they created. The second layer of entities had to respond not only to the site but to these global centers as well, and as a consequence

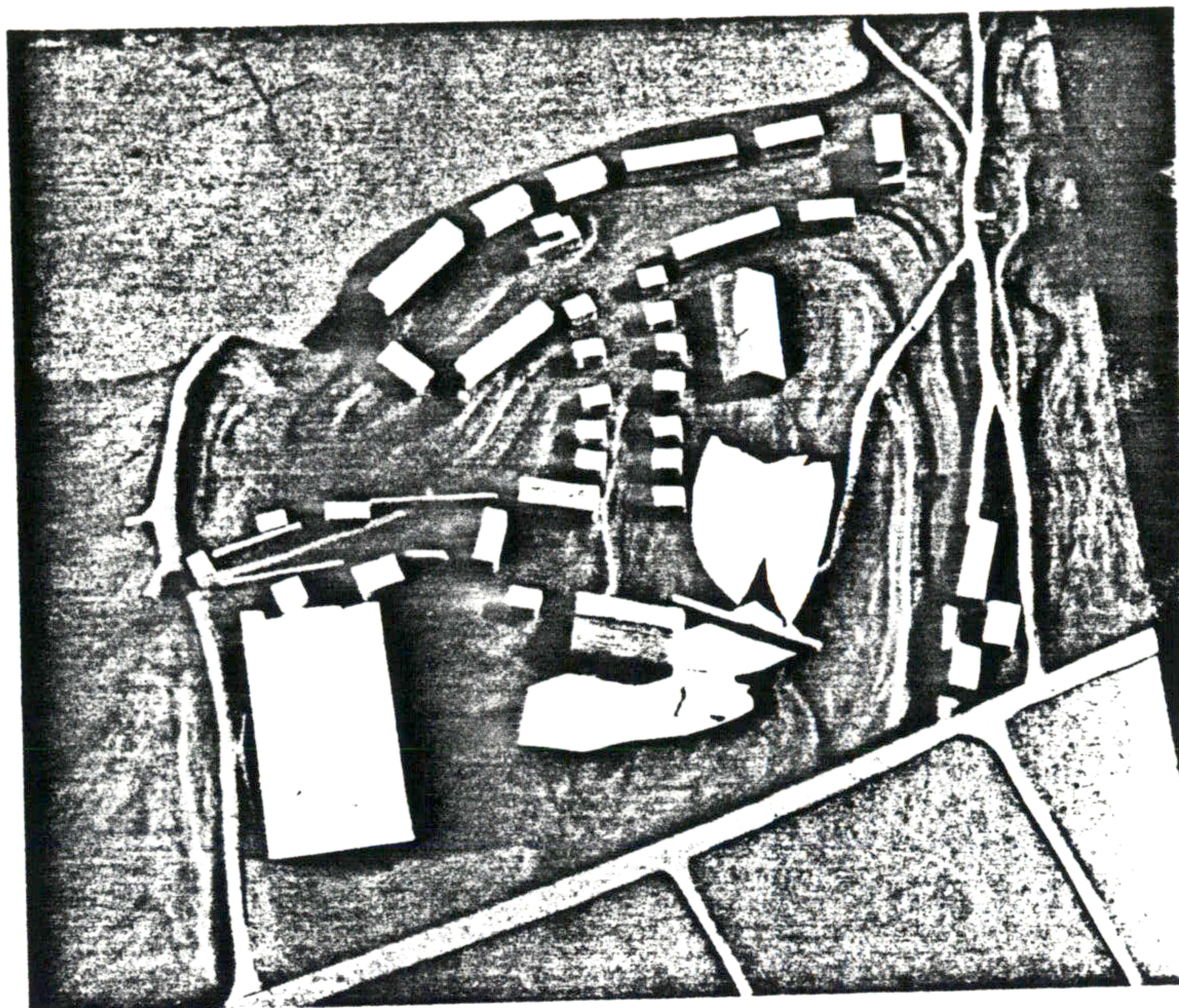
were substantially modified when compared to the definition of their form in the internal structure. In this way all of the smaller entities were changed as they interacted with the site and with the evolving structure of centers.



The study model used to create the global structure for the academic project.

As in the studio exercise, the final equilibrium structure of the site plan for the Eishin School was reached through the use of a model on which the relationship of the context and the campus were studied in three dimensions. An accurate scale model of the site's topography was constructed, and the buildings, roughly specified in the pattern language, were represented by simple blocks cut to their approximate size in scale. The site's structure and the school's internal structure had been thoroughly digested by the time the model

was used, and the actual process of creating the equilibrium structure took a very short time, a matter of ten minutes.

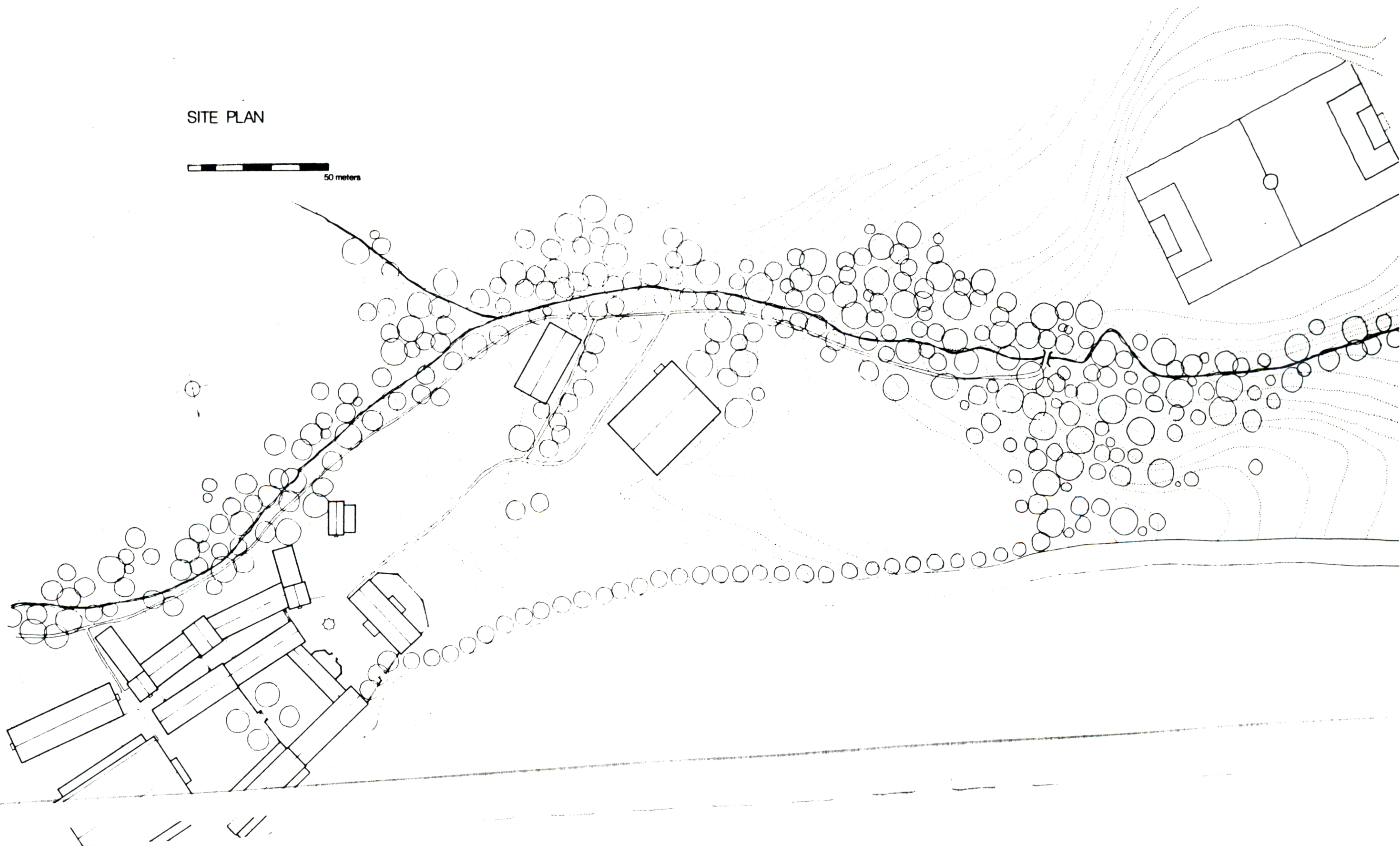


The study model on which the Eishin School's global structure was established.

In both the academic and experimental phases of work, the final site plans succeeded in approaching an equilibrium state, resolving the internal and contextual structures.

The site plan produced during the studio exercise was successful in approaching a state of balance between the structure of the school and the structure of the site. The geometry of the plan, at least slightly, has the relaxed feeling found in the examples presented earlier.

SITE PLAN

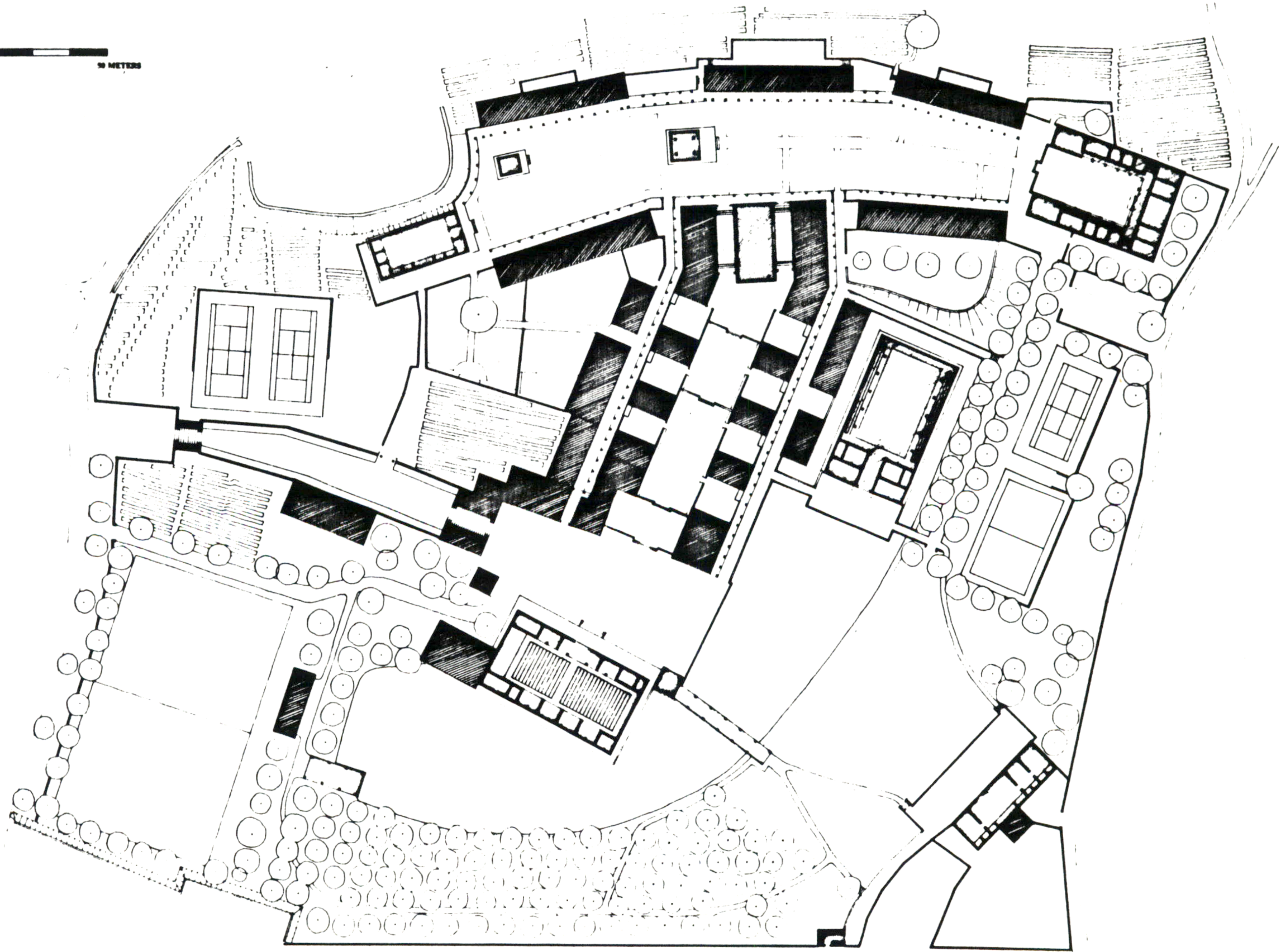


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The final step in designing the Eishin School's real site plan was to lay out the equilibrium structure, physically, on the site. Substantially, the configuration of the final plan, created by placing stakes on the site, was the same as the configuration of the equilibrium structure produced with the model. A great deal of time was spent studying each of its centers on the site to make sure that they had the correct shape, orientation, and relationship to the others. The individual buildings and outdoor spaces were checked against the functions they were intended to support, and the centers specified by the equilibrium structure were adjusted to accommodate the special eccentricities of the site that could not be represented on the model.

THE NEW EISHIN UNIVERSITY

50 METERS



CONCLUSION



The process of creating the campus's global structure succeeded above all because the medium of the work shifted from using two-dimensional to using three-dimensional representations (drawings to models) and, as a consequence, the approach to the work changed from trying to design the new school to trying to make the new campus as one would make a painting, a chair, or any artifact. The model focused the work toward the structure of the campus as a whole, rather than on its smaller parts. It allowed the school to be perceived as an object which could be easily manipulated and modified as it evolved. The structure of the site and the structure of the school were fitted together in an almost playful process, one which concentrated entirely on making the campus itself special and beautiful.

The complexities of the problem were put aside so that the primary task at every step was to decide if each new modification to the campus made its form more beautiful. By definition, the centering process required that judgments of value were made as integral parts of each step, at each splitting or further differentiation of the school's global structure. In other words, each time a new building was placed, or the shape of an outdoor space was created, a value decision had to be made. These decisions were answers to the question of whether the step preserved the beauty of the global composition or not. The centering process assumes

a more basic definition of "resolving the problem" than do design processes, which have as their foundation measurable criteria or stylistic rules. So-called solar architects judge the correctness of the form of their buildings by various measures of thermal efficiency. And likewise, "modern architects" rely on the parameters of the International Style in deciding the goodness of their work. But any process of design which limits the manner by which one judges how well the problem has been resolved to functional requirements or stylistic rules ignores the more difficult question of the beauty and likability of the building's physical substance. This issue is the essential question in the process of creating centers, and was the essential component of the procedure used to create the Eishin School's site plan.

To make correct decisions in regard to the beauty of the new school as it evolved, I observed that, in the end, one had to trust the feelings which told when a particular step was good or bad, that made the school more or less beautiful. These feelings had to be considered as direct responses to the geometry of the campus's physical form.

In the introduction to this report, the idea that beauty is an empirical phenomenon was described as a basic assumption of the work on order taken as the basis for this project. This assumption holds that the perception of beauty is a factual experience in the same way that seeing the color red,

or of feeling cold is replicable from one observer to the next. Order and beauty are considered as characteristics of the physical world.

This assumption stands in opposition to the more prevalent belief that the beauty or likability of any object is an individual experience which is different for each person. The basis of this second assumption is that the perception of beauty is dependent on past experience, culture, state of mind, and is nothing more than a psychological event. In this interactionist's stance, the significance of any building is the result of psychological operations in which neutral perception takes on meaning as it interacts with beliefs, memory, and attitudes in a person's mind. Under the guidance of this hypothesis, architects can produce practically anything and can call it art, since its meaning is different for each person: "beauty is in the eye of the beholder." The intrinsic value of the buildings produced is not at issue, and architecture is not concerned with the creation of beauty, order, or harmony; it is enough for a building to be expressive, functional, technically perfect, or even shocking.

As a working hypothesis, the assumption that beauty and order are objective characteristics of the physical world is more likely to encourage the development of a process for the creation of buildings and complexes of buildings which is open and can be shared. This assumption takes beauty as

a fact that can be studied, and allows it to be openly examined to determine how it was produced, and what physical characteristics it displays in various situations. The interactionist's view, on the other hand, doesn't allow progress toward understanding how to make beautiful buildings, because it accepts beauty as being totally dependent on the observer. The physical world is, in effect, value-free. This can only produce a thousand different opinions about what makes good architecture, none of which deals seriously with the most important question of making the environment more beautiful and truly humane. The Eishin School project has not solved this question entirely, but it at least dealt seriously, and to a degree successfully, with the problem of making a beautiful, ordered complex of buildings.



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APPENDIX ONE:
ENTITIES FOR THE STUDIO EXERCISE

ACADEMIC PRECINCT

The Academic Precinct is the most serious part of the campus. It is the place where the work of education takes place. The whole precinct is about 60 feet wide and 300-400 feet long, with its buildings and gardens organized linearly along the Academic Path. This region of the school is the transition between the communal nature of the Public Precinct and the quiet individual nature of the Library Place. It is a quiet but bustling area; people move through at all time of day, but are quiet out of respect for the work of others.

Entities that form the Academic Precinct:

- Science Department
- Language Department
- Seniors' Clubhouse
- Woodworking Shop
- Art Department
- Social Sciences Department
- College Students' Hall
- Gardens for Parking
- Garden Rooms
- Departmental Yard
- Academic Path
- Departmental Hearth

ACADEMIC PATH

A long gravel path, with lines of fruit trees on both sides, forms the spine of the Academic Precinct. This walkway leads from the action of the school yard to the quiet of the Library's stillness. The path is long and straight, effectively a long garden: sunlight in the summer, the kaleidoscope color of autumn, and the fragrant return of life in the spring. Marking the edge of this long garden path are the walls of the academic buildings and the walls of small intimate gardens. At times this place is full of movement and life, and at others it is quiet and lonesome.

GARDEN ROOMS

These places are small walled gardens with flowers, vines, bushes, and small trees all around their edges. They are good places for outdoor class meetings, quiet study, or discussions. These rooms have benches around their low walls and are paved with tiles; there are plenty of places to sit and sleep in the sun. Intimate conversations take place, lovers meet here between classes. There are several of these outdoor rooms repeated regularly along one side of the Academic Path, sometimes standing free in the landscape, sometimes between buildings, but always with the same sort of gateway.

READING HALL

This place is the essential core of the whole of the campus. It is a large room, 20 feet high and 40 feet long, with tall windows along its two longest sides. Below the windows and on the other sides of the room are shelves of books, and in the middle of the room are rows of long tables for reading and quiet study. Within the library building, this is by far the most important place, and for the campus this place represents the school's soul--the place where the life and meaning of this institution are most concentrated. The essence of education, the passing of knowledge and understanding from one to another, seems to reside here. The place evokes inquiry.

DINING ROOM

This hall is a long, tall room with low, intimate alcoves lining its two longest walls. This place's life varies during the day, but is at its rambunctious peak during the lunch hour. In the afternoon and morning, the alcoves are full of people drinking coffee, talking, and studying together. The light for the room filters through the openings to the alcoves from windows on the exterior walls. These windows look onto small gardens with tables for eating outside when the weather is warm and sunny.

DEPARTMENT YARD

Between each Department and the Academic Path is a south facing yard about 30 x 70 feet. The place in the sun between the trees of the path and the wall of the building, this is the place you walk across before entering the building. On at least two edges are wings of the Department, and in the yard are just the necessary things: a foot path, the main entrance to the Department, steps up to the door, and a green lawn. These places are the settings for simple, unrehearsed activities: a place to eat lunch in the sun close to your work, a place to step out for a smoke when things aren't going as well as they could, a place to get a breath of fresh air and to watch the people shuffle past.

GARDEN GATE

On each wall defining the gardens of the campus are garden gates--doors between the public yards and paths, and the more removed domains. All gates are similar, three feet wide, a thickening of the wall, higher than the rest of the wall, and closed across the top with a lintel. These gates form the threshold between two different domains in all cases.

SCHOOL YARD

If there is one single important outdoor space for the campus, this is it. The School Yard is a large grass lawn, about 70 x 200 feet, with buildings loosely around its edge, and with a few trees and a small fountain near the end with the entrance gate to the campus. Its edge is strongly defined by a covered gallery that completely surrounds the space. This yard is the place of public activity for the whole of the school: people move through it at all times of the day, informal games of soccer are played before class in the morning, students gather here before going into the auditorium, and people wait here for their rides home. The memory of the school resides in this place. This is where things happen.

LIBRARY PLACE

This area, though small in size, makes the school complete. The place is separated, somewhat isolated from the rest of the school, not in an arrogant way but in a way that truly represents the importance of its position. The Library building is raised up on a terrace, a few steps above the path that leads to it. The place between the building and the edge of the terrace is a strip of land 10 feet wide-- building on one side, low wall on the other, with trees formally planted in between. This is a still place, a quiet sun-mottled garden for reflection and quiet study.

PUBLIC PRECINCT

The Public Precinct is a roughly rectangular collection of buildings organized around the gallery and the school yard. The auditorium is the most important building in this region of the campus, and the school yard is its most important space. The area is always busy and communal activity occurs here every day: coming and going, eating lunch, horsing around, meeting friends, going to concerts or plays, playing games on the grass, standing in the sun to talk, student rallies, graduation ceremonies. This is the precinct in which the school as a single social entity is most recognizable.

Entities that form the Public Precinct:

Building Gate

School Yard

Dining Room

Gallery Walkway

Fountain Place

Gardens for Parking

Garden Gates

Auditorium

Cafeteria

Administration Building

Student Union

BUILDING GATE

The Administration Building forms a covered gateway into the School Yard. This is the main entrance into the campus, a space as thick as the building through which it passes and about 25 feet wide. Its floor is paved with tiles and is raised a few steps above the yard. Two bays of columns, supporting the second floor above, define its edge, and are places to stand and lean while waiting. (This is the place to wait for your ride to pick you up or to catch the bus home.) The morning sun greets you here, and in the evening on departure the setting sun floods the place. During the middle of the day, this is a dark space before entering the light of the School Yard. It is a place of decision of sorts. Both inside and outside the school are visible from this threshold.

FOUNTAIN PLACE

This is the first place to greet you once through the Building Gate and inside the School Yard. It is a paved place of transition from the shade of the gate to the light and green of the School Yard; it is a very simple place, a small fountain with three or four trees around it. You can meet your friends by the fountain, and people congregate here before classes in the morning. When the noise and activity of the School Yard fade away as the day ends, the sound of the fountain comes to establish the character of the place once again.

GARDENS FOR PARKING

Between each of the departmental buildings, and between the buildings of the School Yard, are wild, overgrown places in which cars can be parked. They are paved with gravel, and grass and vines are allowed to grow everywhere. A solid wall with a gate in the middle separates the cars from the rest of the campus. There is enough room in each of these for 10 or 12 cars.

GALLERY WALKWAY

The School Yard is completed at its edge by a roofed walkway, 8 feet wide, columns every 10 feet, a pitched roof with its edges close enough to touch. It is the place at the edge, out of the rain and snow. The Gallery continues around all four sides of the Yard and is joined to the Building Gate. It is the place between the Yard and the buildings of the Public Precinct; a protected place from which you can watch the activity of the Yard without getting into the middle of it. Low walls for sitting are between some of the columns, and people feel free to stop and talk or watch the happenings of the Yard. In some sense, it is a lonely, withdrawn place, a place for public solitude, walking around and being alone.

ATHLETIC GROUNDS

The Athletic Grounds in a large precinct of the campus that is made up of a four-acre grass field, surrounded by a running path and a continuous row of shade trees along all sides. This piece of land is directly adjacent to the rest of the campus. It is a place for running and playing, a place to get rid of the tensions associated with school work. In the corner of these fields, furthest from the rest of the school, are located the gym and the locker room buildings. To get to there from the campus requires a pleasant walk along a path under the shade trees, a walk that leaves the seriousness of the school behind and replaces it with running and shouting and playing--unencumbered fun.

HIGHSCHOOL COURTYARD

The Highschool building forms a small courtyard, 60 feet square, with its two-story walls all around, defining each side. An opening through the ground floor, on the side closest to the Academic Path, makes an entrance to the court, and on the opposite side is another opening in which you can find the main entrance to the building. The floor of the space is paved and in the middle is a single large tree. The place is strictly the domain of the Highschool; everyone who takes part in the Highschool uses the court at some time, but in particular the place belongs to the younger students, since their home classrooms are in the building. It's their home at school.

CAMPUS

The campus is a low-density collection of buildings organized within a complex of paths, yards, and small gardens that cover an area of about 6-8 acres. The character is relaxed and unimposing. Within the Campus are four distinct precincts or regions:

1. Public Precinct
2. Academic Precinct
3. Library Place
4. Athletic Fields

Each of these regions is clearly a specific, separate entity within the whole, combined in a relaxed, non-formal way that is based on the necessities of the piece of land on which it sits.

3. THE BUILDINGS OF THE INNER PRECINCT

1. The main building of the public yard, is the great hall. This is a long hall, with seating for 600 people, surrounded by rooms and galleries, so that it can seat a full congregation of 1200, for important meetings.
2. The second building of the public yard, is the Eishin museum: a small house, which explains the place and its philosophy to visitors. There are other minor buildings to surround the yard.
3. The buildings which form the tanoji grid, are the college departments. These are organised so that one feels the college as a whole. These are placed around the edge, so that one feels the college as a whole, whenever one walks through.
4. Each of these college departments has a garden. When you study there, you feel the presence of the garden.
5. At the very heart of the tanoji center, is the student house: a building three stories high...which stands exactly at the axis of the crossing paths.
6. In addition, there are other buildings, shared by college and high school, which form the streets and centers inside

the tanoji grid: these buildings include the judo hall, a small gymnasium, clubrooms, smaller classrooms and lecture halls.

7. The buildings which form the homebase street, are the individual homeroom buildings. Each of these buildings is two stories high, and has one classroom on each floor, the upper one with its own staircase leading to the ground.
8. The main center of the homebase street, is the large gymnasium, which stands at one end of the street, and forms the street.
9. The secondary center of the homebase street, is the faculty hall, which stands somewhere near the middle of the street, as easily accessible to all the homerooms as it can be.
10. The buildings which form the college cloister, are the research buildings for the college faculty. These are buildings where intensive discussion about the problem of local government, and research, take place.
11. The main center of the college cloister is the library. It stands two storeys high, with the main reading room on the second floor, and with the lower floor open and accessible, and open so that people can pass through.

4. THE STREETS OF THE INNER PRECINCTS

1. The public yard has a gravel surface, with stone paths crossing it. It is informal, and quiet in character.
2. The tanoji center's streets, are wide streets, which form a cross. The streets have stone surface: at the central point, of the cross itself, there is a space, which is the crucial busy center of the high school and the university.
3. The homebase street is even wider than the streets of the tanoji center. There are trees in the middle, and the street is flanked by raised terraces, along both sides, where the buildings stand. The buildings are colorful, and spontaneous.
4. The college cloister is extremely quiet. It is raised, perhaps with a lawn or garden in the middle, and an arcade around the edge.
5. The lawn, which leads down to the water of the lake, is relaxed, and pleasant and informal: a place where students can lie in the grass and have discussions.
6. One-half of the tanoji center is more public and more busy. It is the place where students are moving every day.

It is also the place where graduation ceremonies pass.

7. The other half of the tanoji center is more mysterious. It is the part, towards the college cloister, perhaps behind the student house. This part is glimpsed through gateways, or through columns and arcades: but it is quiet and unreachable for high school students. The glimpses they have of it, give them a longing for the part of their education when they will be studying there.
8. Within the inner precinct, and especially in the tanoji center and the homebase street, there are many arcades - structures of roofs and walls or columns, where people can walk in the rain.
9. In addition, there are many subtle level changes according to the rise and falling of the land.
10. If possible, the homebase street has three zones at slightly different levels, corresponding to the three grades of the school.
11. And somewhere very important in the homebase street there is a special terrace, surrounded by balustrade or sitting wall, where students often meet.

12. Opening into this special terrace, is the high school dining room, where the high school students meet and eat their lunch.
13. The college students also have their own eating place. It is a cafe which is part of the student house at the heart of the tanoji center.
14. Within the inner precinct, all connections between buildings and public spaces, are marked by wooden gateways - much less imposing than the main gateway, but small and nicely shaped and distinct.
15. Around the tanoji, but inside the inner boundary, there is an additional passage, a very quiet passage, with small doorways leading to the open fields beyond.

5. THE OUTER PRECINCT

1. The wall which surrounds the inner precinct, is quite irregular, and follows the buildings, and paths, and terrain. It is similar to the inner wall of a great Japanese castle.
2. Outside this irregular inner wall, is the outer precinct, which is made up of alternating sports fields, gardens, and important outbuildings.
3. The alternation between sports fields, gardens, and outbuildings is done in such a way that each one of these things always forms a separate and distinct entity by itself.
4. This means that each sports field is always standing by itself, not next to others, and is instead surrounded by a hedge, wall, separated from the space next to it by a free standing building, otherwise surrounded and made distinct.
5. In addition, every sports field, is always attached to some building, which has nothing to do with the particular sports function. Thus, for instance, the tennis courts, may be next to the art studio, and placed so that people entering the art studio, are just at that place where the tennis court is most enjoyable to watch.

6. The different sports fields, gardens, and outbuildings which make up this chain of alternating space, are the following ones:
7. There is an orchard, tended by the students.
8. There are the science labs, mainly used by high school students, but also open to those college students who wish to continue scientific work.
9. There is a soccer field.
10. There^{is} a carpentry workshop, where various kinds of tools and equipment are available for students to make things.
11. There are two tennis courts, preferably on grass.
12. There is a music studio. This music studio, should be behind the great hall, somehow, so that musicians have easy access for practice and performance.
13. There are several small fields of tea bushes left from the present agricultural state, and farmed by local farmers.
14. There is the art studio, which has space for painting, and sculpture.

15. Somewhere close to one end of the homebase street, but still in the outer precinct, there is a small building which contains the sewing and the cooking laboratories.
16. There is a swimming pool, in a place that is fun to watch, and fairly close to the inner precinct.
17. There is a small museum and maintenance center, which contains the record of the construction of the project, and is the shop from which ongoing construction and maintenance are done.
18. There is a volley ball court.
19. There is covered sports area, about 12x30 meters, with a roof, and open sides, where students can play active games in rainy weather.
20. Somewhere there is a quiet area, with benches, trees and ponds. This quiet area, might most naturally be at the far side of the college lawn, so that it creates a destination for people who cross the lawn.
21. There is an open air basketball court.
22. There are handball courts, or squash courts, with walls and roofs.

6. INTERNAL STRUCTURE OF THE IMPORTANT BUILDINGS

1. Inside the inner precinct, the buildings and exterior spaces are placed in such a way there is a subtle, indirect path, passing through the school, and always reaching places which are more indirect and more private and more secluded, with changes of direction, and subtle barriers.
2. The buildings themselves continue this feeling, in their inner structure...All the buildings are organised internally to produce a rather intimate collection of larger rooms and smaller rooms, entirely without the formal corridors and stairs typical of modern schools and universities.
3. The college departments, arranged around their gardens, each contain about 6 seminar rooms, individual rooms for professors, and common rooms where students can read and study.
4. The high school homeroom buildings, are two storey buildings, with one classroom upstairs, and one down, and a stair going directly to the ground from the upper classroom.
5. The faculty hall, contains a common room for faculty, with rooms for group discussions grouped around it on the first floor: and individual study and discussion rooms upstairs.

6. The library, also a two storey building, has a large quiet reading room on the second floor, with shelves, and tables and carrels, and beautiful windows. Underneath there are open passages, arcades, and extra storage for the library.
7. And the great hall, contains a central space, which is a long narrow hall, with pews that seat 600 people, surrounded by raised rooms, with sliding screens, which can be removed to seat a total audience or congregation of about 1200 people.
8. The homerooms are small, for 30 students each, and with a very private character.
9. The 24 smaller classrooms, suitable for seminars and individual learning will have special character by three different room sizes, and also by the specific subject taught.
10. There are two different kinds of clubrooms for high school students, 10 rooms for sports clubs, and 10 rooms for cultural clubs.
11. For college students there are special clubrooms, where they can discuss endlessly, philosophy, politics, arts, and local government problems...These clubrooms are highly visible.

12. The science lab building contains a physics lab, a chemistry lab, two preparation rooms, and a small lecture room.
13. The music studio contains two music rooms, wood paneled, with two smaller classrooms, and practice rooms.
14. The judo hall contains two areas of fifty mats, surrounded by the galleries and open space for people watching.
15. The small gymnasium contains wall bars, equipment for dance and gymnastics, and long mirrors on the wall.
16. The administration building contains administration for both high school and college in a single building.
17. The two examination halls, have space in them for lectures to a hundred students, or for showing films, and also formal examinations.
18. The university cafe, contains a dining room for university students, a dining room for faculty, a kitchen, and a small public coffee shop.
19. Opening off the entrance street, there are bicycle sheds, to hold 70 - 100 bicycles.

20. There are various small spaces for storage and other miscellaneous functions.
21. There is a calligraphy room, with tatami floor, and traditional interior, at some point in the tanoji, looking out over one of the internal gardens.
22. Somewhere in the school, perhaps outside the calligraphy room, there is a small exhibition space or gallery, where student's works can be displayed.

8. And there are flowering cherry trees, where they are very visible in spring.

8. INTERIOR BUILDING CHARACTER

1. The interior character is warm and subdued: wooden columns, floors and walls in places; pale yellow wall color, comparable to golden chrysanthemums, paper or silk; near white sliding screens and ceilings.
2. Floors of many buildings are raised, slightly more than usual, off the ground.
3. Classrooms have polished wooden floors, or carpets on the floor, and shoes are off inside the classrooms.
4. All homebase classrooms will have big windows facing south.
5. Many rooms have gallery spaces to one side, where light comes in beyond, and shines through screens.
6. Many walls and other surfaces are wooden, with natural unfinished wood.
7. The classrooms and other rooms are furnished with very solid mason wooden desks, which several students share.
8. In the larger buildings, there are mirrors, where students see themselves.

9. Outside the buildings, there are often flower beds.

10. And inside, here and there, throughout the school, there are surprising soft highlights of color, shining out among the subdued colors of the rest...a figure painted in pale kingfisher blue...in one place; a golden yellow iris in another.