

**Spatial Sequence in the Historic Gardens**

by

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(ABSTRACT)

In designing spaces, designers should consider spatial sequence and its experiences, since we experience environment in a sequence along movement. The more a place satisfies desired experiences, the more the place will be successful. This thesis explored spatial sequence as a design tool by examining the major design elements of spatial sequence, the designed patterns of these elements in some cultures, and the sequential experiences and effects of the patterns. As a way of exploring spatial sequence as a design tool, cases in formal classic landscapes (Korean temples, Mughul gardens in Kashmir and Italian villas) have been examined. Classic landscapes have developed elaborate sequential patterns to achieve certain experiences and effects. Especially, the spatial sequence of classic formal landscapes is designed to be experienced along a major axis and to show straight forward and highly controlled sequence. Thus, classic formal landscapes are good examples of showing strong relationship between spatial sequence and spatial experiences. The three landscapes are examined and compared in terms of change of level, change of spatial characteristics and transition places to explore spatial sequence and sequential experiences.

The results of this research showed that the designers of these landscapes deliberately used spatial sequence to elicit certain emotional responses and experiences specifically desired under the contexts and purposes of the places. Korean temples located in the mountains provide good nature-related experiences and religious-but-inspiring experiences. The temple designers created delicate yet powerful sequential experiences through the effective use of site conditions and landscape elements. The designers of Mughul gardens worked to create cool and friendly spatial experiences in the hot climate and vast landscapes. They utilized water and planting materials in various ways to give a refreshing and intimate feeling through the whole sequence. Spatial sequences of Italian villas are designed to add to the pure pleasure of the residences and thus show the most articulated sequence design. Especially, level changes, as one of the sequential elements, have been used effectively to create or increase certain sequential experiences. In Korean temples, the irregular slopes of sites are shaped sometimes into even and constant rises or sometimes into a rapid rise to make various sequential effects. The Mughuls deliberately made small level changes out of flat plains to create an intimate sequence. The Italians used level changes to create a vivid sequence. The steep slopes of hillsides are altered in two opposite directions: horizontally wide and vertically high. The existing site conditions are utilized and modified in various ways to make specific sequential experiences and effects.

The findings confirm that spatial sequence is an effective design device which can satisfy desired experiences and thus can create successful places. Good sequence is the one that is appropriate for its purpose and for the context in which it belongs. More concern for and more understanding of spatial sequence will enable the designer to create an environment that will provide more pleasing spatial experiences.

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## Introduction

*"...We may walk through and past the buildings, and as a corner is turned an unsuspected building is suddenly revealed. We may be surprised, even astonished."--Gordon Cullen (1961) p.9.*

People in motion experience their environments in a sequence. Simonds (1983) defines sequence as a succession of perceptions having continuity. Our perception of a space is influenced by the perception of the preceding space and the expectation of the space yet to come. Our perceptions of spaces and environment are conditioned and modified by the sequence in which we perceive them. As Bacon (1974) states, if we acknowledge that an objective of life is the achievement of a continuous flow of harmonious experiences, then spatial sequence - the relationship of spaces to one another, as experienced over time - becomes a major design problem.

Today sequence design is of paramount importance in urban design. Cullen (1961) sees city design as "an art of relationship" which is essentially a problem of sequence design: *"In fact there is an art of relationship just as there is an art of architecture. Its purpose is to take all the elements that go to create the environment: buildings, trees...and so on, and to weave them together in such a way that drama is released. For a city is a dramatic event in the environment"* (p.10). But the concept of spatial sequence in environmental design has not been widely used and not much attention has been focused on this subject. It has been directly or indirectly referred to in only a handful of writings in the design field (Cullen 1961, Appleyard 1964, Lynch 1972, Bacon 1974, Ashihara 1981 and Simonds 1983).

Although Ashihara (1981) and Simonds (1983) view spatial sequence as an effective design device, as Lynch (1972) states, its artistic potential has not been fully explored. *"Our new mobility and our new attitudes toward time and change have substantially increased the potential of sequence design. Yet sequence design is practiced rarely, and then only in the simplest way. Few of its inherent possibilities for artistic expression have yet been exploited"* (p.185).

Knowledge of and concern for spatial sequence will enable the designer to create the environment which will provide more pleasing spatial experiences. As Bacon states, if one can design the area adjacent to the movement path of large numbers of people to produce a continuous flow of harmonic experience, successful designs in cities will be created (Bacon, 1974). Also, in high-density areas, spatial sequence can be an extremely effective design device, since a properly planned sequence will satisfy more people with lower cost. *"Space modulation! We in America have yet to learn the meaning of the words. But we will learn it in the crowded years ahead, for indeed we must."* (Simonds, 1983, p.205).

Some elements and techniques of sequence design have been discussed in the literature. Thiel (1961), Appleyard (1964), Halprin (1965), Abernathy and Noe (1966) attempt to devise a

workable technique of sequence design in cities by developing notation systems of sequential experience. Although all these authors are mainly concerned with sequence design, they deal with graphic notations. The design aspects of sequential experience have not been discussed in their works.

It is very difficult to determine whether one sequential arrangement of a place is better than another because too many variables are involved in the evaluation of each arrangement, such as physical variables, individual differences, and past experiences (Im, 1983, p.36). But it can be said that there is some consistent response to certain sequences. Simonds (1983) states that each sequence has its own character and evokes an emotional response that can be fairly well predetermined. Further, he proposes that *"obviously, the alignment, speed, and the nature of motion produce in a moving subject a predictable emotional and intellectual response and must, therefore, be carefully considered"* (p.198). If the designer can manipulate human emotions through the arrangement of sequences, it is an effective design tool.

### **Purpose**

This thesis will examine design aspects of spatial sequence. The use of sequence to achieve a certain emotional effect has been well utilized in classic landscapes. Temples, e.g. Teotihuacan<sup>1</sup>, have increased their divinity by using progressive sequences of high terraces and steps. Another planned sequence can be seen in the classic oriental gardens. *"In the orient such approaches are designed with admirable sensitivity....The approach is designed as a superbly modulated transition, from the crude to the refined, from the crass to the rich, from the distracting to the introspective, from the temporal to sublimity"* (Simonds, 1983, pp.207-8). They show elaborate sequence patterns, and the emotional responses they evoke have been widely expressed and discussed in the literature. Therefore, spatial sequence will be examined through examples of classic landscape design.

Specifically, this study will seek the following :

- the major design elements of spatial sequence
- the designed patterns of these elements in some cultures
- the sequential experiences of those patterns

This thesis is organized into six chapters. Chapter II discusses spatial sequence as a design tool by examining some elements and types of sequences. In chapter III, reasons and methods of sample selecting and analysis are discussed. Further, background information on selected samples are provided. Chapter IV presents descriptions of spatial sequence and provides analytical drawings of each sample. The results of analysis and implications are discussed in chapter V. Chapter VI provides the implications of this research for design practice and education and makes recommendations for the future.

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<sup>1</sup> Teotihuacan is one of the few real cities in ancient Mexico. The great pyramid of Teotihuacan is 700 feet at base and 200 feet high. There are five tiers, on top of which was a temple to the cult of Teotihuacan, god of the sun.

## **Spatial Sequence**

The focus of this thesis is on spatial sequence as a design tool. The purpose of this chapter is to examine spatial sequence with sequential elements and types through reviews of "kinds of elements which effect experiences through spaces" and "kinds of sequential experience which we meet in our environment." The first section deals with major sequential elements: change of spatial qualities and linkage of spaces. The second section provides types of sequences that our environments provide. The last section deals specifically with change of level as one of the sequential elements.

## Elements of Sequence Design

*"Though clay may be molded into a vase, the essence of the vase is in the emptiness within it....Therefore, taking advantage of what is, we recognize the essence of what is not."--Lao Tzu, in Exterior Design in Architecture, Yoshinobu Ashihara (1981) p.40.*

Space exists as a void within which people can move, visually or physically. Experience of space or spaces is rarely static. It requires time and motion. Our visual world cannot be seen simultaneously but must be experienced in some temporal sequence. *"Since man experiences the world about him as it is revealed in progression through a series of variformed spaces, each space and each object within it is for the subject an incident in an evolving time-space sequence"* (Simonds, 1973, p.19).

The movement from space to space creates a series of experiences derived from the nature of the spaces. These continuous experiences may have for a person more impact than any experienced in either space alone. Even a space may induce in the same subject an entirely different response depending on the qualities of the space from which the person has entered. Since spatial experience is, as Simonds (1983) notes, compounded of that which we have perceived, that which we are perceiving and that which we expect to perceive. *"The wide, free space is wider and freer to us when we realize that behind or beyond it we have known or will know the compression of confined spaces"*(p.205).

Therefore, environment for a moving person is a series of linked spaces, each possessing a particular quality and each related to the other. The relationship between spaces, as well as their own qualities, becomes an important factor in sequential experience. The spatial relationships are primarily conceived through the changes of spatial qualities and the linkages of the spaces.

### **Change of Spatial Qualities**

*"People in motion take great pleasure in the sensation of change - change of texture, light, quality, temperature, scent, visual patterns, expanding or contracting vistas, and the fluid visual impressions of objects, spaces, and views." -- John O. Simonds (1983) p.203.*

In a series of perceptions, our senses tend to catch differences between things more easily than the similarities; and our minds respond to the differences. Thus, a sequential experience becomes more vivid when there are changes in the sensation along the movement. *"A long straight road has little impact because the initial view is soon digested and becomes monotonous....when two pictures (the street and the courtyard) are in the mind at the same time, a vivid contrast is felt and the town becomes visible in a deeper sense. It comes alive through the drama of juxtaposition"* (Cullen, 1961, p.11).

Thus our spatial experiences along movement are also primarily influenced by the changes of spatial qualities. *"If we design our towns from the point of view of the moving person (pedestrian or car-borne) it is easy to see how the whole city becomes a plastic experience, a journey through pressures and vacuums, a sequence of exposures and enclosures, of constraint and relief"* (Cullen, 1961, p.12). The changes in spatial characteristics such as form, scale, use, enclosure, light, sound and details will make the spatial sequence more noticeable. Even a change or slight change of one element could be critical enough to create a vivid sequence: from a noisy space to a quiet one, from a bright space to a dark one. If spaces are

properly planned with changes both in an order and in a combination, the spatial sequence can have a powerful effect.

Thus, an order and rate of succession is another important element in sequence design. Simonds (1983) discusses it in terms of spatial modulation and space cadence. *"If a sequence is marked with a rhythmic recurrence of one or more spatial qualities - size, shape, color, lighting, or texture - a cadence soon becomes evident....Suffice it to note that, in the planning of any spaces through which people are to move on foot or by vehicle, an understanding of both spatial modulation and space cadence is essential"* (p.207).

Appleyard (1964) allegorizes sequence design with music, using tempo and rhythm. *"Tempo and rhythm are the primitive essence of any sequence. The tempo of attention appears to be a sensitive index of the quality of the road....It may be that there is an optimum range for the time interval between strong impressions: that longer intervals cause boredom, and shorter ones bring on strain and confusion...a roadscape should have a basic beat, a regular frequency with which decisions and interesting visual impressions are presented"* (p.17).

### **Linkage of spaces**

*"A boundary is not that at which something stops but, as the Greeks recognized, the boundary is that from which something begins its presencing."*--Heidegger (1971) p.154.

The way of linkage - whether a connection or separation of spaces - influences sequential experience. By design, it can make sequential experience vivid and even powerful. The linkage or the spatial separation might be as loose as in a slight level change or as strong as in a high wall or a narrow entrance. The spatial linkage usually takes its shape from the "transition place" or the "threshold." Traditionally, the transition place and the threshold have been used for the accentuation of sequential experience. For example, the Japanese designed transition spaces to enhance sequential experience by means of a gate, a level change or a turn. A framed glimpse in the oriental garden is a threshold that psychologically defines "here" and evokes anticipation to "there."

*"In the spaces provided for by locations there is always space as interval, and in this interval in turn there is space as pure extension."*--Heidegger (1971) p.156.

A transition place or a threshold might be a boundary or an interval between spaces. Further, a series of transition spaces could be a transition place for a larger space. "Transition place" is the place of diverse spatial experiences. It provides both limit and extension of spaces and brings together contrasting sensorial elements of architecturally defined space. In moving through such space, one conceives here and there, sees light and shady, hears noise and quiet.

## Types of Sequence

All sequential experiences we encounter in our daily environments are not the same in terms of received senses, raised expectations and resulting emotions. The spatial experience of a pedestrian will be quite different from that of a driver. Even a pedestrian will sometimes meet a highly controlled sequence or sometimes a casual or spontaneous sequence. Even in the planned sequence, the sequential experience in the formal garden will be different from the one in the informal garden. Different places require different senses and thus provides different experiences. Therefore, an understanding of the kinds of sequential experiences in various places will be helpful in designing sequence of outdoor spaces.

### *Kinesthetic versus Visual Sequence*

For a person on foot, perception of space is not a matter of sight alone. It engages the full range of senses and feelings. All the senses are involved - sight, taste, smell, touch, and hearing. *"The changing visual picture is only the beginning of the sensory experience; the changes from light to shade, from hot to cold, from noise to silence, the flow of smells associated with spaces, and the tactile quality of the surface underfoot, all are important in the cumulative effect"* (Bacon, 1974, p.20).

However for a driver, vision, rather than sound or smell, is the principal sense. *"The modern car interposes a filter between the driver and the world he is moving through. Sounds, smells, sensations of touch and weather are all diluted in comparison with what the pedestrian experiences"* (Appleyard, 1964, p.4). True kinesthetic sensations are slight in a steadily moving car and become strong only in abrupt changes of speed or in angle of climb or fall.

These different sensory perceptions require different techniques for sequence design. The kinesthetic experience (movement through space) is exemplified in the design of the traditional Oriental gardens. Visual experience is skillfully interwoven with movement, bringing all of the senses into play. Physical participation is of key significance in that movement through a space becomes a highly orchestrated event involving the hand and foot as well as the eye and ear. Edward Hall (1969) writes the following of the designers of the traditional Japanese garden:

*"They were particularly ingenious in stretching visual space by exaggerating kinesthetic involvement. Not only are their gardens designed to be viewed with the eyes, but more than the usual number of muscular sensations are built into the experience of walking through a Japanese garden. The visitor is periodically forced to watch his step as he picks his way along irregularly spaced stepstones set in a pool. At each rock he must pause and look down to see where to step next. Even the neck muscles are deliberately brought into play. Looking up, he is arrested for a moment by a view that is broken as soon as he moves his foot to take up a new perch....They employ vision and all the other senses as well. Olfaction, shifts in temperature, humidity, light, shade, and color are worked together in such a way as to enhance the use of the whole body as a sensing organ"* (pp.51-2).

### **Planned versus Spontaneous Sequence**

*"There must be regularity and fantasy, relationships and oppositions, and casual, unexpected elements that vary the scene; great order in the details, confusion, uproar and tumult in the whole."--Tafuri (1979) p.4.*

Sequential experience varies its range from a highly controlled sequence to a natural and spontaneous sequence. The controlability of a sequence will be different depending on the place and scale. Spatial sequence in some places (as in a garden) is easy to control and can be planned at the designer's preference. But spatial sequence in a big place (as in a street or a city) is not always under control, since there are plenty of routes to combine and many unpredictable factors on the streets. Spatial sequences in a city are not only reversible, but are broken in upon at many points. Thus, Appleyard (1964) and Lynch (1960) suggest that sequences of roads be constructed like a magazine serial or a pattern in jazz.

*"Therefore it may be necessary to look for sequences which are interruptible as well as reversible, that is, sequences which still have sufficient imageability even when broken in upon at various points, much like a magazine serial. This might lead us from the classic start-climax-finish form to others which are more like the essentially endless, and yet continuous and variegated, patterns of jazz" (Lynch, 1960, p.114).*

*"The sequential form may have to be more like a magazine serial, in which an underlying total development depends on separate episodes, each with a self-contained form of its own; or forms may have to be symmetrical, with climaxes at both ends, so that a two-way audience can be played to; or the unified climactic form may have to be abandoned for the articulated but "endless" composition, of the kind typified in jazz or medieval polyphony, or such tales as "Br'er Rabbit" (Appleyard, 1964, p.18).*

But in a self-closed setting like a garden or a park, sequence can be a matter of precise design control. It might have a classical "introduction - development - climax - conclusion" sequence or might be "melodic" (analogous to music).

*"A close examination of the arrangements of steppingstones in Japanese gardens suggests that they are like musical scores written on the ground. Those steppingstones on which a man can walk quickly are allegro, while those on which a man leisurely strolls are andante cantabile. There are always some landmarks that suggest a change in tempo and direction, such as lanterns, and some big stones that are placed, like rests, at strategic places for people to take in the scenery. People can follow the musical scores written on the ground and appreciate the intentions of the designers of the gardens, experiencing space through their own bodily movement" (Ashihara, 1981, p.95).*

### **Uni-directional versus Multi-directional Sequence**

*"...To savor fully the complicated multiple relationships, the contrasts, the unexpected juxtapositions, the surprises, and the varied views that each position in the garden affords, one should, as the writer George Kates recommends, wander quietly and a little aimlessly, allowing the garden to work its magic."--Murck/Fong (1980) p.20.*

Even in a self-closed setting, spatial sequence is utilized quite differently, depending on the character of the setting. A formal landscape tends to emphasize uni-linear sequence along the major axis. The long formal approaches to thrones and altars built by kings and priests to awe the suppliant are classic examples. *"They are simple rhythmic progressions, however rich and massive the materials employed, building to a final climax of splendor or dread, designed to read in one direction under controlled conditions. Gardens and cities have similar*

*processional ways*" (Lynch, 1972, p.185). The sequence is designed to be experienced in one direction, whereas in informal landscapes, or in some large gardens, another kind of sequence has been designed.

*"A series of contrasting settings are meant to be traversed in such a way that the order in which they are seen adds to the pleasure of the experience. The gardens at Stourhead, to take one example, are designed as a delightful circuit about a created lake of irregular form, in which one view follows another, opening and closing among varying plantings, seen from low or high, aimed at structures of successively diverse character and association"* (Lynch, 1972, p.185).

Here, an unexpected, casual sequence is emphasized. But it is different from the spontaneous sequence in that even the casual effect is not spontaneous but planned.

## Change of level

*"As the floor of the city changes levels, the walking experience achieves a new quality and a different dimension. Through steps and ramps, platforms and long sloping planes, the horizontality of plazas and squares acquires a new sense of drama. By emphasizing these variations even the most mundane and everyday occurrences can achieve grandeur and assume the evocative qualities of dance and theatre."*—Halprin (1972) p.116.

Change of level is one useful sequential element. To vary ground levels is an effective design technique, since level changes designate clear boundaries between areas and allow several spaces to connect with one another or to divide apart. The degree of spatial continuity depends on the scale of the level change.

Even slight variations in elevation can be used for various effects: to create interest, to emphasize and dramatize a certain place or to bring a quality of dimension to the flat surfaces. *"It was indeed straight - in plan. But the path escaped the reproach of rigidity, by rising and falling ever so slightly, to follow the gentle undulations of the ground. The changing levels of the path provided the essential interest, the element of variety, and prevented its dominant straight line from becoming tedious"* (Thacker, 1983, p.53).

*"...stairs represent a concretion of abstract space. They are tracks in space, cut to size for the human body, and provide the frame and the means for departures of the imagination"* (Giersch, 1983, p.33).

Steps and ramps are the most frequent architectural elements used as a connection between different levels. But they are used and designed, in many cases, for more than the necessary functions. Steps sometimes are used as a piece of furniture to lie on, sit on, stand on and place things on. Some great steps in the world have been designed to transform necessity into artistic experience. One classic example is the Spanish Steps in Rome. They are regarded as a great theatre piece in the heart of the city, a series of rhythmical variations akin to the experience of a dance sequence. Steps, by design, can give theatricality and a sense of drama to a moving person.

Another example of artistic experience beyond necessity can be seen in Le Corbusier's ramps. The kinesthetic experience along the vertical movement has been a thematic concern in his Villa Savoye. *"Of course this ramp is first of all a functional element, but in this case it is also much more than that, forming a specially designed path-space through the building which reveals, as one traverses it, the structure of the building, permitting constantly changing, unexpected, and sometimes quite astonishing perspectives; in the entrance hall the contrast of linear path and sculptural form, followed by the narrowness of the first ascent with the light from above, the stepping out onto the open terrace, the path upwards from the terrace with the view of the interior and exterior, and finally the endpoint of the path with the wholly unexpected framed view of the landscape"* (Joedicke, 1984, pp.106-8).

### **Psychological Responses**

There are some psychological aspects to level changes besides the functional and aesthetic ones. Cullen (1961) states that the observer's position in a world makes the difference in a feeling. He notes that height equals privilege, depth equals intimacy, lower levels produce intimacy, inferiority, enclosure and claustrophobia, higher levels produce exhilaration, command, superiority, exposure and vertigo. *"To be above datum produces feelings of authority and privilege; to be below feelings of intimacy and protection"* (p.175).

Others have noted that a change in level between spaces provides kinesthetic experience (Ashihara 1981, Meisenheimer 1983). One's feeling in going up a stairway is different from that in going down the stairway. Meisenheimer (1983) describes the psychological responses of a vertically moving person. *"If the passage leads upwards, then it is experienced - also bodily - as conquest, as a special exertion which leads into the distance, to "on high"....If the passage is downwards, then powerlessness, resignation, or subjection can be expressed...."To go upwards" can mean to storm upwards, to soar, to become airborne, to conquer; "to go downwards" perhaps to fall, to tumble down, to disappear"* (p.18).

In sacred landscapes, this kind of experience was emphasized using high terraces and steps. *"The Altar of Heaven itself, the most sacred place in China, where twice annually the emperor made sacrifice, is the purest possible space experience. The three cylinders, each defined by one of the three tiers of ascending balustrades, set into motion vertical shafts of space articulation. The climax of the experience is the point of meeting of the stairway and the sky"* (Bacon, 1974, p.247).

In profane landscapes, change of level was used and developed for various sequential effects. In English landscape gardens or in Japanese gardens, natural undulation of the sites was preserved and emphasized to create harmonious natural garden landscapes, whereas in Italian Renaissance gardens or in French formal gardens, sloped sites were leveled into terraces to accentuate the motion or to avoid a monotonous feeling of formality.

The level change pattern of informal gardens has evolved in a different direction than that of formal gardens. For example, the English landscape garden, by avoiding architectural elements--such as steps or terraces--and by developing sunken walls called ha-ha, was designed to follow the meandering line which the "genius of the place" suggested and to emphasize natural, smooth sequential experience. *"With the advent of the ha-ha, the visual and physical interruption of the wall was eliminated....This procedure is therefore directly opposite to that furthered by the steps and terraces of both Italian and French gardens, since it brings about the blending and the visual unification of two separate, and previously incompatible, regions"* (Thacker, 1983, pp.61-2).

Design aspects of spatial sequence will be explored through examining the major sequential elements: change of spatial qualities and linkage of spaces. The types of sequence provide the context for a specific sequence that will be examined. Among these types of sequences, this research specifically will examine sequences that pedestrians meet in a self-closed setting.

## **Garden Selection**

This chapter provides means of classic landscape study and the methods of sampling and analysis. The purpose of this chapter is to explain the reasons and ways of the study and to provide background information about selected landscapes. The first section deals with the purpose of classic formal landscape study and cross-cultural study and specifically with the reasons for level change study among other sequential elements. The second section discusses criteria for sample selection and ways of analysis. The last section provides the historical and local backgrounds of selected landscapes and plans of samples.

## Purpose

The purpose of this research is to explore spatial sequence as a design tool. One way of achieving this purpose will be to look at well designed examples of spatial sequence in landscapes and to draw out design techniques from the examples. In the past, some landscape designers, for example designers of Oriental gardens, have focused on sequential experiences in designing outdoor spaces. Thus, examining classic landscapes will be a way of finding well designed sequence examples.

Each classic landscape has a unique pattern of spatial sequence, since the pattern has evolved from each landscape's own social and physical context for a long time, and has been designed for special purposes or effects. Thus, each sequence pattern is highly original and evokes specific effects. Comparing these sequences will show the relationship between a sequential pattern and its effects. Therefore, this research will examine several classic landscapes.

There are two kinds of directional sequences--uni-directional and multi-directional. The uni-directional sequence, which is usually found in formal gardens, is straightforward and highly controllable, whereas multi-directional sequence, which is mostly used in informal gardens, allows various experiences, depending on the combination of routes. This research will specifically examine cases of uni-directional sequence by examining formal classic landscapes.

This study focuses on the changes of level in uni-directional sequence. Classic formal landscape designers have designed changes of the ground level into level planes. Sloped sites are leveled into terraces and steps. Even in flat sites, some of terraces and steps are purposely planned for formal effect. The designers have used level changes for various sequential effects, whether working with flat sites or sloped ones. Thus, studying level changes is a good way to see the relationship between the sequential pattern and its effects in the formal landscapes.

## Means of Study

To examine level change patterns in uni-directional sequences, classic formal landscapes sited on sloped areas were chosen. They are the Korean Temple, Mughul Garden and Italian Villa. Several representatives of each landscape were selected, based on the criteria described below. Each landscape should be:

- well-known and representative of a specific landscape type
- formal and axial
- sited in a sloped area
- characterized by well developed terraces and steps
- sufficiently described in the available sources.

Landscapes selected for study were :

- Korean Temple : Bumeosa, Haeinsa, Hwaumsa, Tongdosa
- Mughul garden in Kashmir : Shalamar Bagh, Nishat Bagh, Achabal, Chasma Shahi
- Italian Villa : Villa Lante (Bagnaia), Villa d'Este (Tivoli), Villa Garzoni (Collodi), Villa Farnese (Caprarola)

The designed changes of level and their sequential effects were analyzed in each sample. In each case, the same three elements were analyzed - the change of level, the change of spatial qualities, and the transition points. The analyses are based on photos and verbal descriptions of those places as well as on plans and sections. Additionally the analyses of Korean temples are based on personal observations from previous visits.

Drawings were made from photos, sketches, plans and sections. They are divided into design components, such as terraces, buildings and vegetation and major paths and transition places, and these components are analyzed separately to see the design effect of each component and the inter relationship of the components. All drawings, except Shalamar Bagh and Nishat Bagh (1"=200'), are made at the same scale (1"=100') to allow for size comparison.

From the analysis, the sequential patterns of the three parts and the overall pattern of each landscape were drawn. Then, the three landscapes were compared with the patterns in the context of the setting.

## Historic and Local Background of the Gardens

Historic development and local background such as weather and location are provided. The design characteristics and plans of the samples are also presented.

### The Korean Temple

Buddhism in Korea has flourished for over 1300 years, and hundreds of temples have been erected during the period. Their preferred location has been changed over time. When Buddhism was first introduced in this country during the seventh century, most of temples were located on the plain near palaces. But as the Zen sect, one of the Buddhist sects, became prevalent around the ninth century, temples slowly moved into the mountains and finally settled there by the fourteenth century. Thus, temples are generally classified into three types - plain-location, hillside-location, mountain-location - according to the site on which they are located. Regardless of their type, and thus their location, temples show similar changes in level and sequential pattern.

In the Korean Temples, ascending is the primarily important experience, implying religious discipline. They used slopes of the sites and developed a distinctive level change pattern. Natural topography of the sites is fully considered in laying out buildings and creating spaces. Outdoor spaces are of primary concern in the temple design and are created with buildings. There are several typical spaces - processional space, main space, minor space and sacred space. The processional space is an entrance space on the lowest area, leading to the main space. The main space, on which the main hall is located, is the major part of the temple, where all religious events are held. At the top, the most inner space is the special space which mostly keeps sacred, religious things.

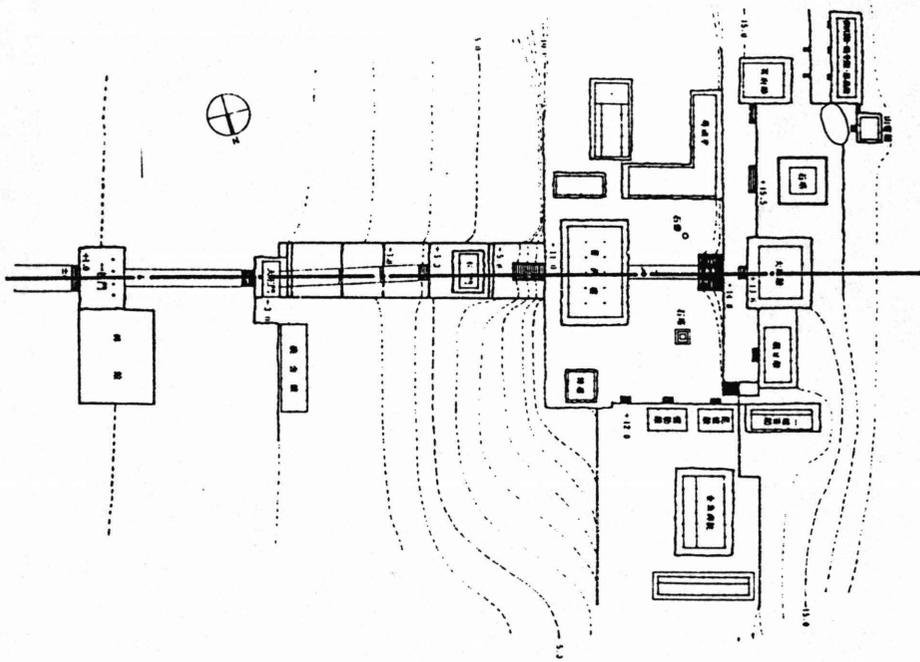


Figure 1. Bumeosa (Plan and Axis)

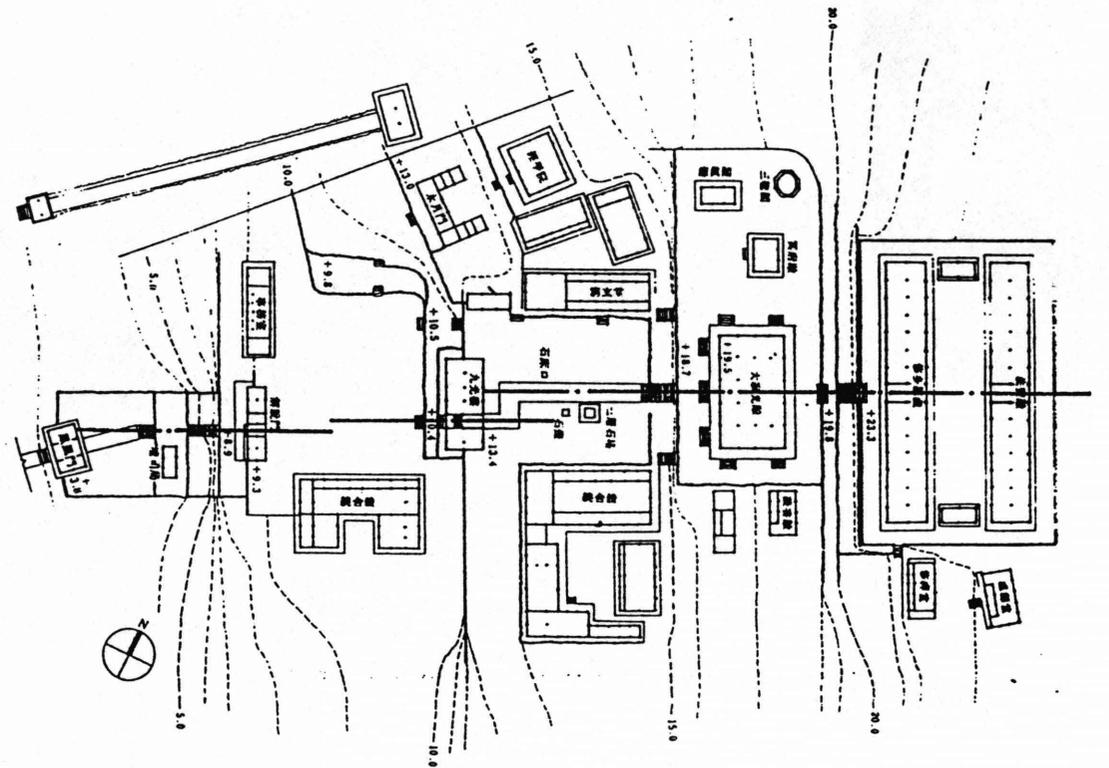


Figure 2. Haeinsa (Plan and Axes)

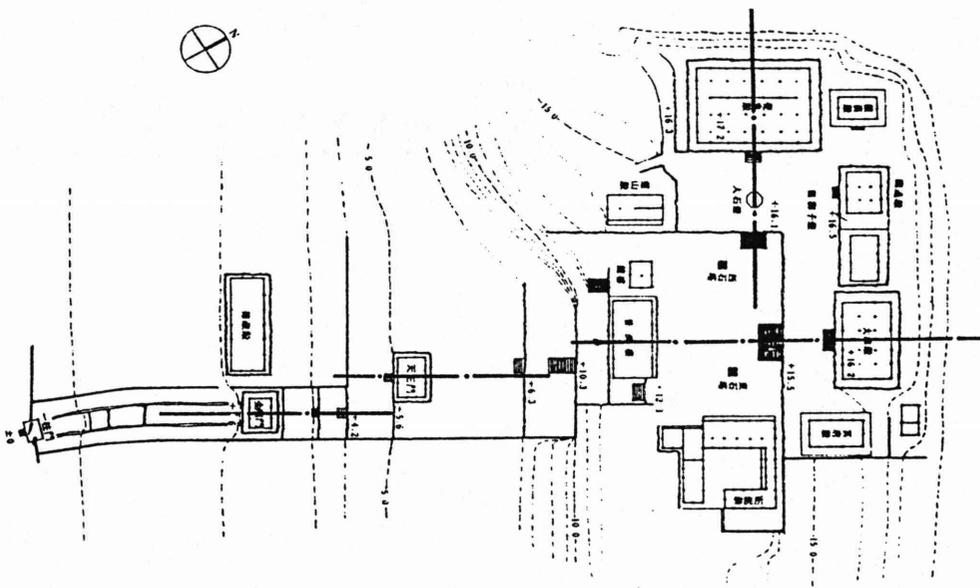


Figure 3. Hwaumsa (Plan and Axes)

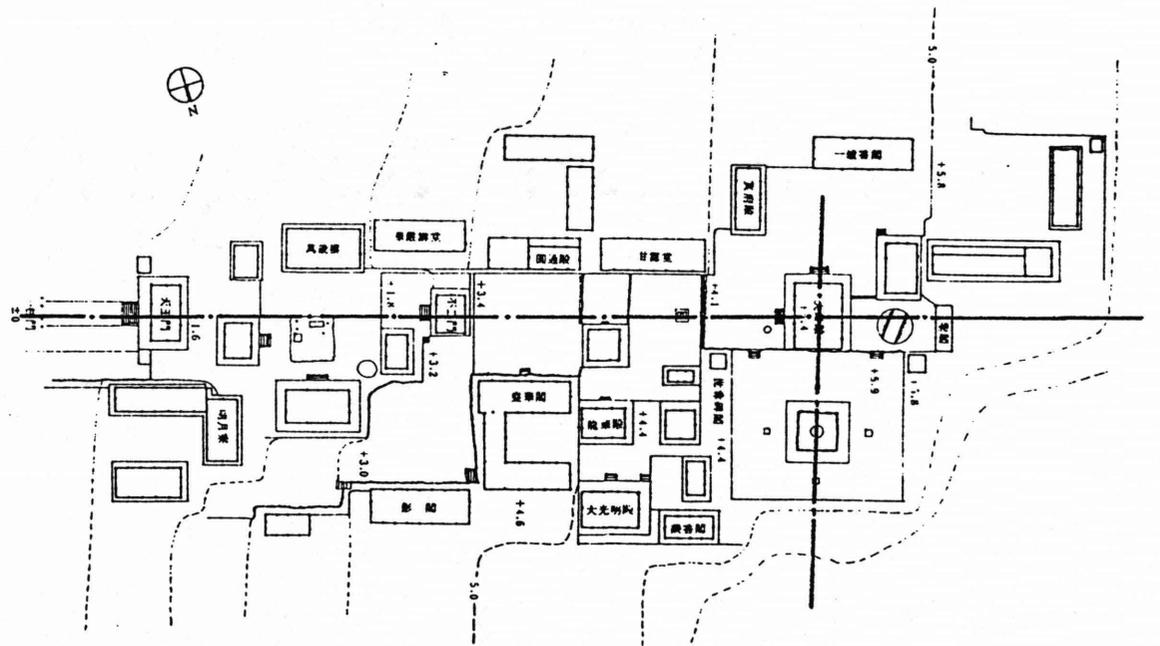
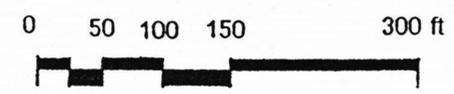


Figure 4. Tongdosa (Plan and Axes)



### **The Mughul Garden**

The garden art of the Mughuls first came into flower about 1500 A.D. and reached its climax in Kashmir some 150 years later, running roughly parallel with Italian Renaissance gardens. The vale of Kashmir, some 90 miles long and 25 miles wide, centers round the basin of the River Jhelum and Lake Dal. Summer gardens were created on the shore of the lake. In its peak time, it is said, there were no less than 777 such gardens.

Kashmir is almost entirely surrounded by mountains, partly outlying peaks of the Himalaya range. The greater part of Kashmir is protected from the severity of monsoon by the Pir Panjal range. Thus its climate is ideal in early summer and autumn, unlike the other places of India. Water also is abundant here, while gardens elsewhere in India suffer from lack of water. In addition to the two great lakes, the Wular and the Dal, and the River Jhelum, there are several springs and innumerable smaller streams. This exceptionally favorable environment makes Kashmir the core of Mughul garden art. The steep mountain sides provide scope for terraced gardens and dramatic water landscapes.

Figure 5. Achabal (Plan and Axes)

Figure 6. Shalamar Bagh (Plan and Axes)

0 50 100 150 300 ft



(Source : The Gardens of Mughul India)

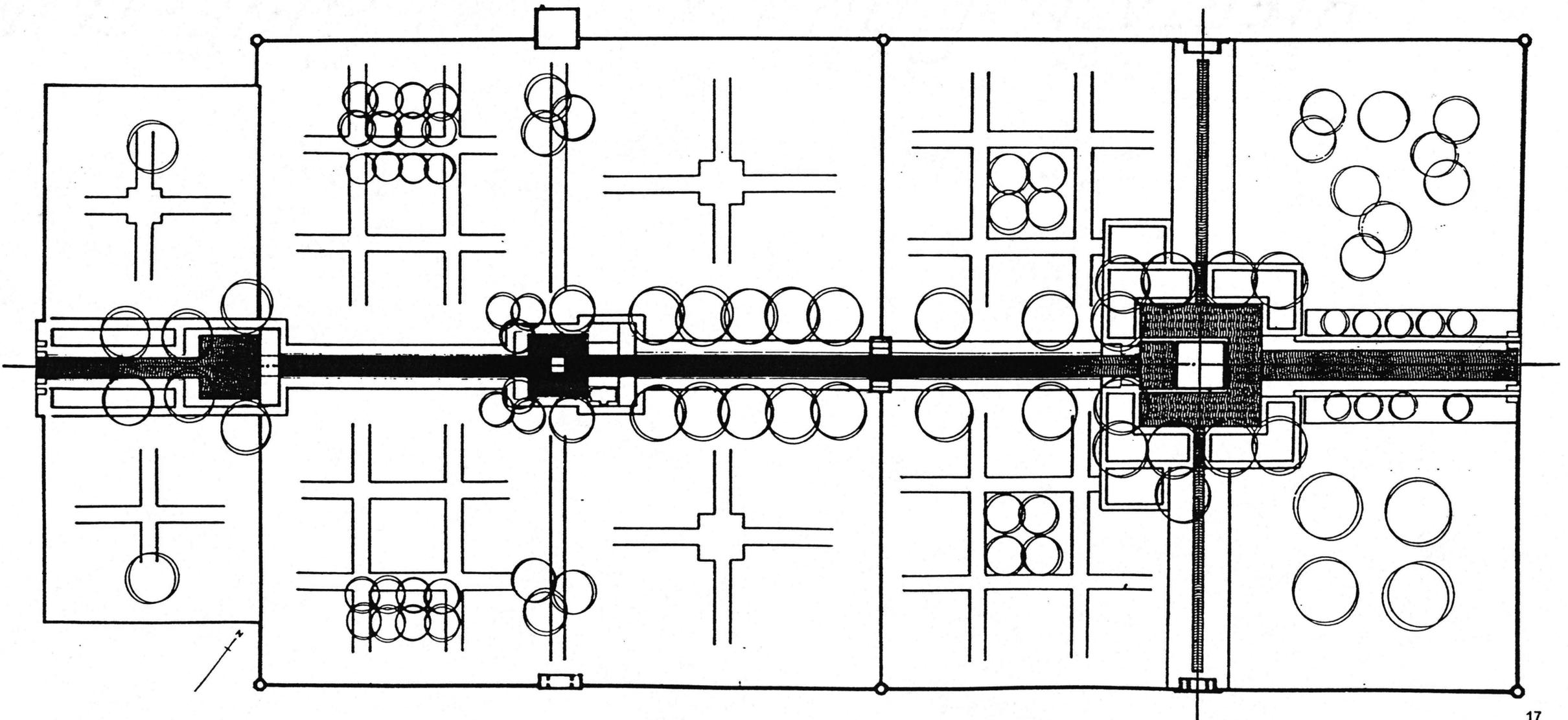
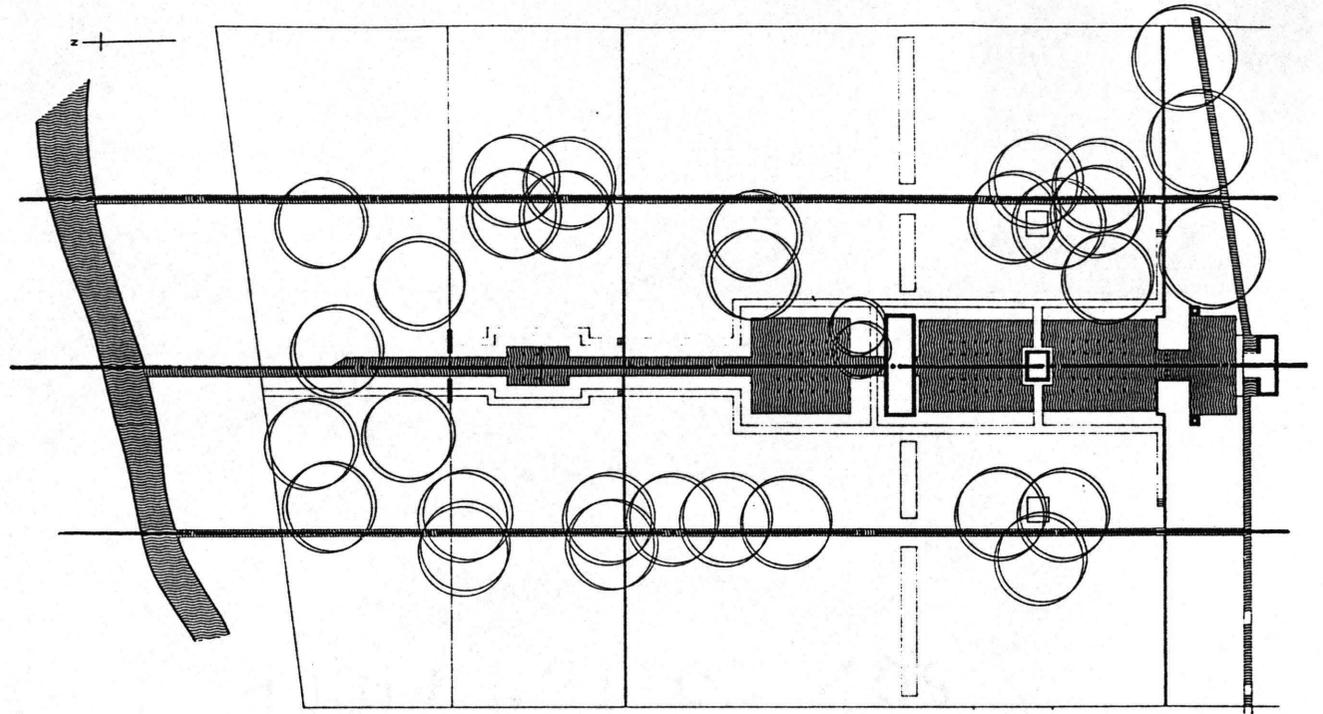


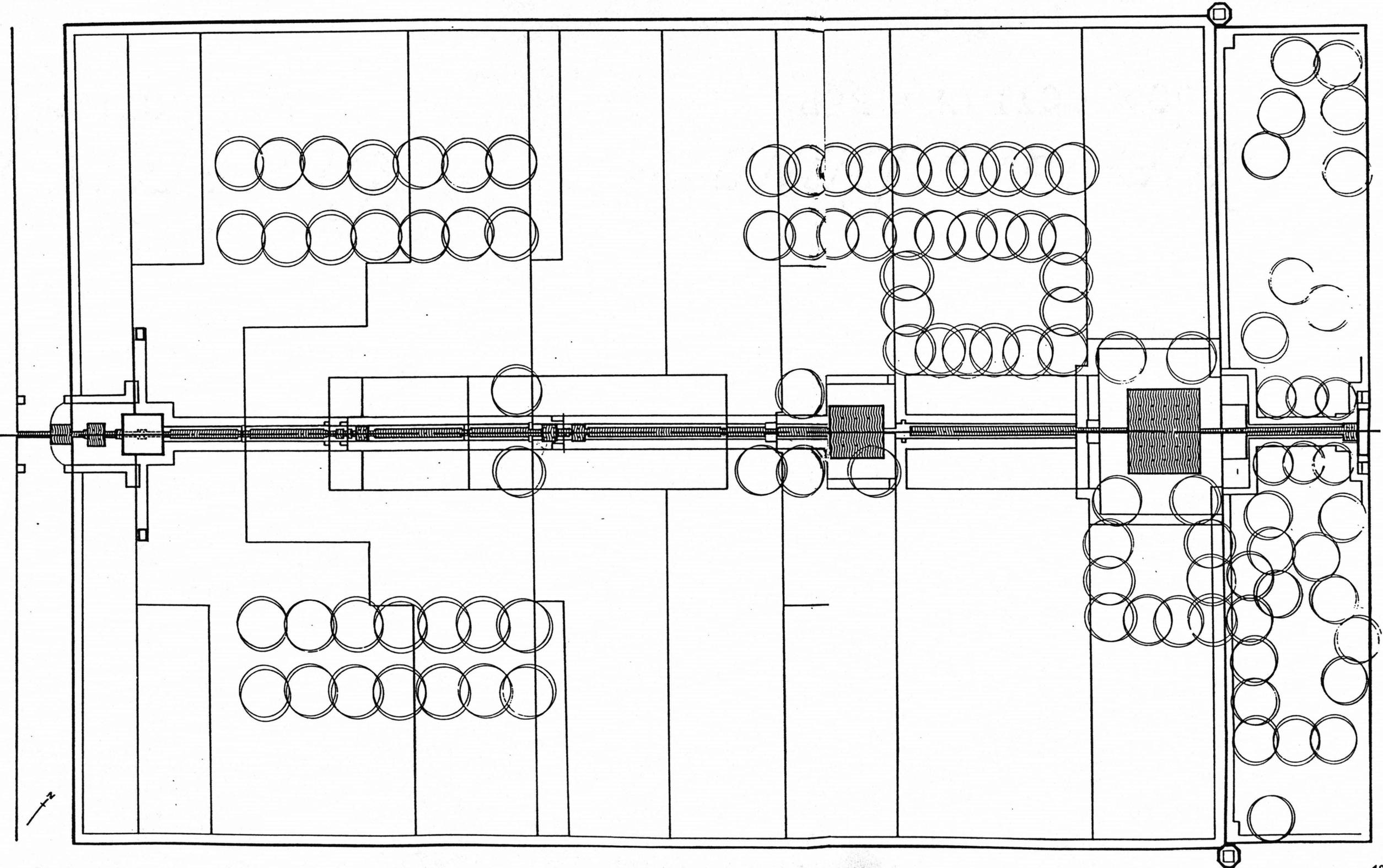
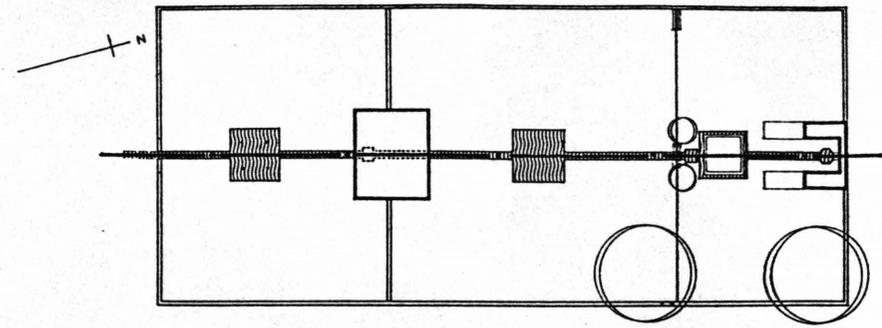
Figure 7. Chasma Shahi (Plan and Axis)

Figure 8. Nishat Bagh (Plan and Axis)

0 50 100 150 300 ft



(Source : The Gardens of Mughul India)



## **The Italian Villa**

Both climate and topography in Italy are irregular. To the north are the flat plains of Lombardy; in the center are river valleys and plains that have mild winters but hot summers; and in the south, the climate approaches tropical. Landscape design developed in three distinct areas: Tuscany, Rome, and across the north from Genoa to Venice. The Tuscan landscape is composed of small hills and valleys dotted with farm buildings and plantations. The Roman Campagna, in contrast, is a wide flat plain of poor farms. The sites are usually on hillsides because of view and climate.

During the Renaissance in the fifteenth century, garden design was influenced by the writings of Pliny and Alberti. It was proposed that the villa should be located on a hillside. Terraces and stairways were recommended to overcome the difficulties of uneven terrain, and an avenue or axis was used to link up all elements and spaces of the plan. With the Baroque, the garden became theatrical, designed for unfolding drama in which people were players. If it were a hillside with abundance of water and a view, the garden might emerge as a giant cascade artificially planned for perspective, with terrace upon terrace for spectacle.

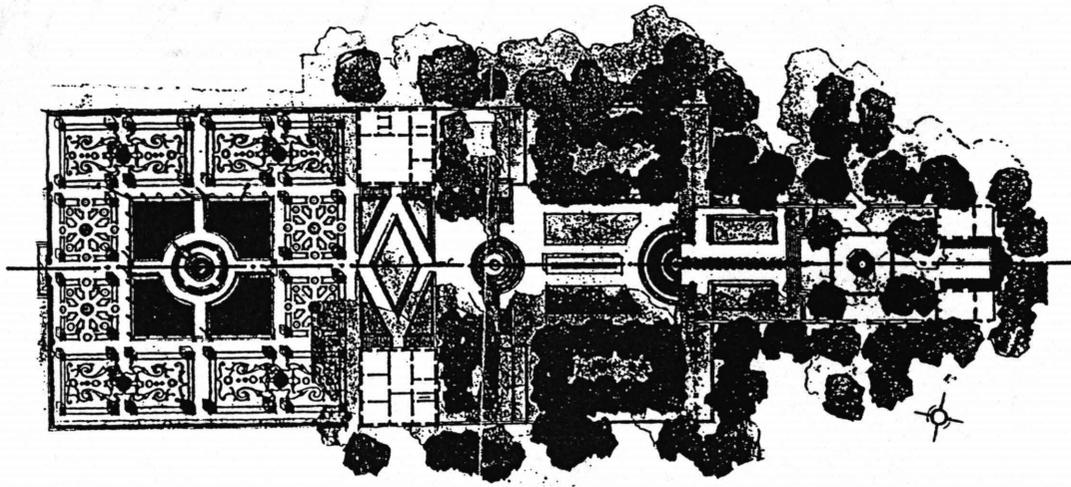


Figure 9. Villa Lante, Bagnaia (Plan and Axis)

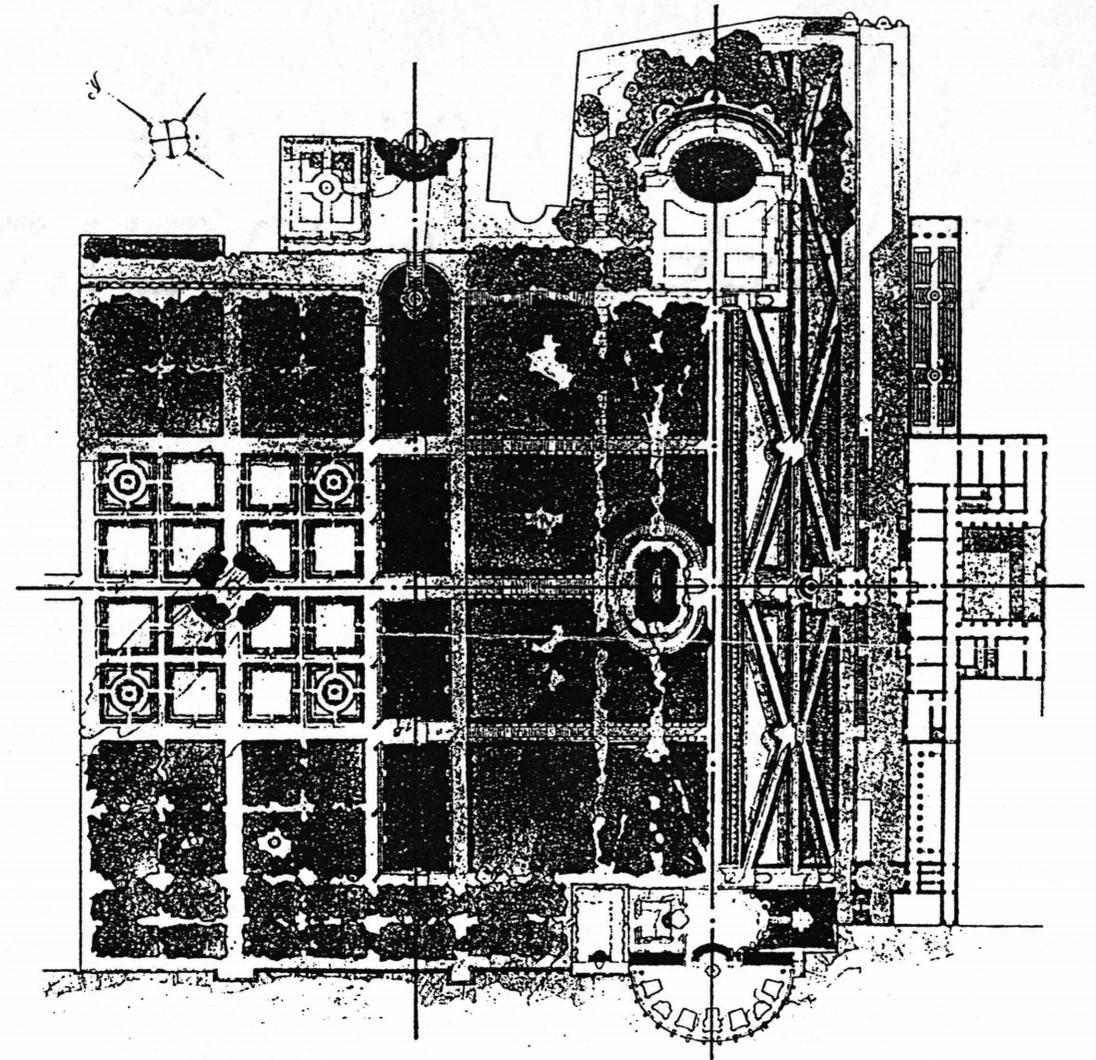


Figure 10. Villa d'Este, Tivoli (Plan and Axes)

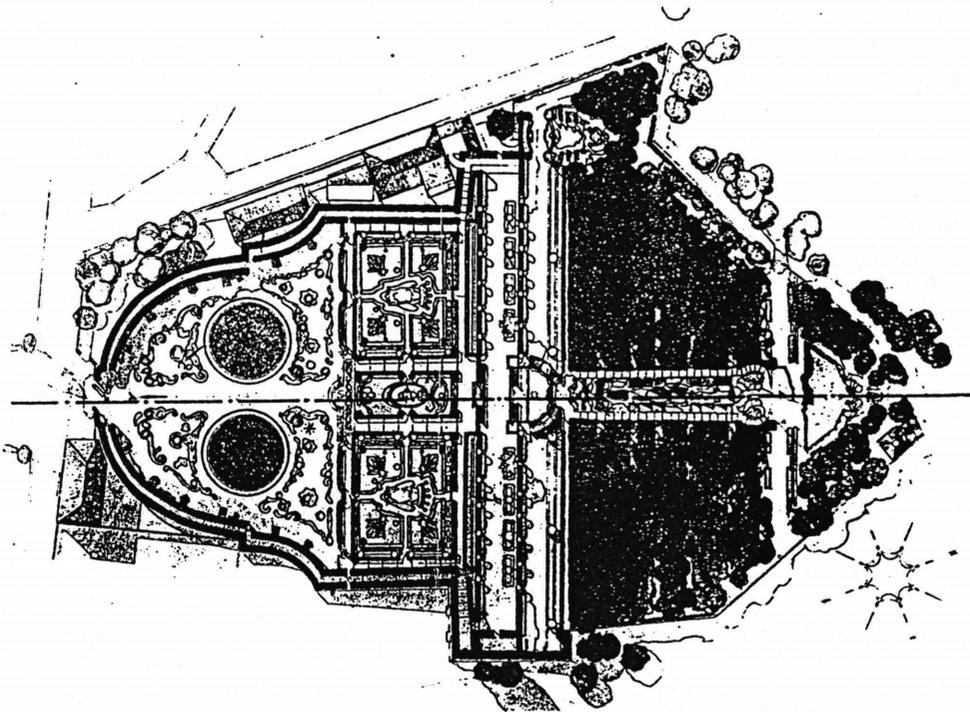


Figure 11. Villa Garzoni, Collodi (Plan and Axis)

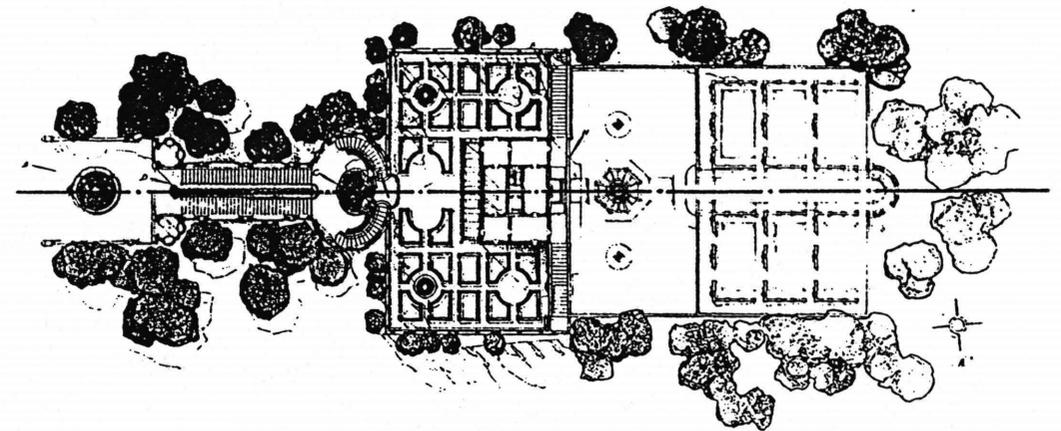
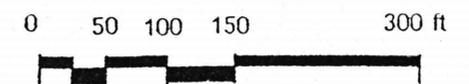
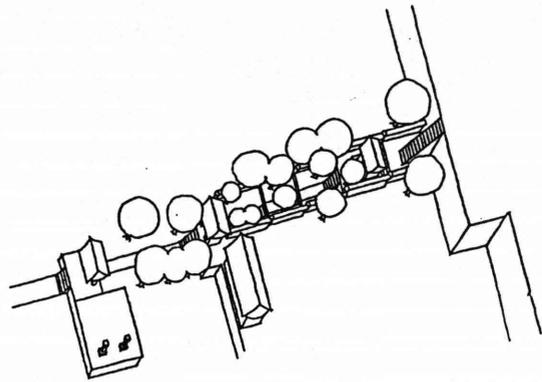


Figure 12. Villa Farnese, Caprarola (Plan and Axis)

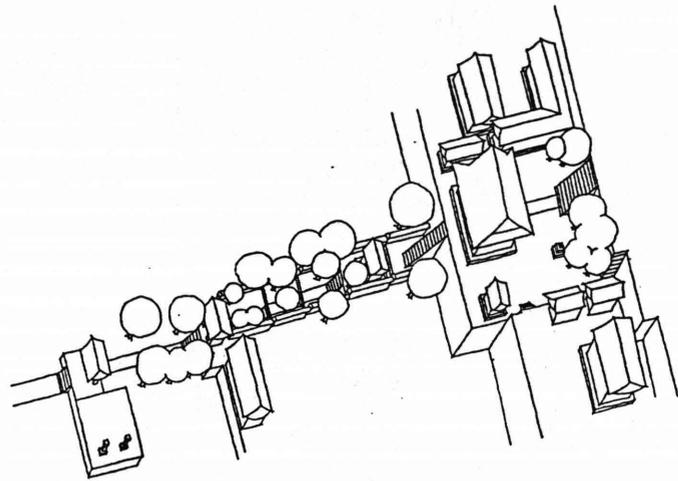


## The Gardens

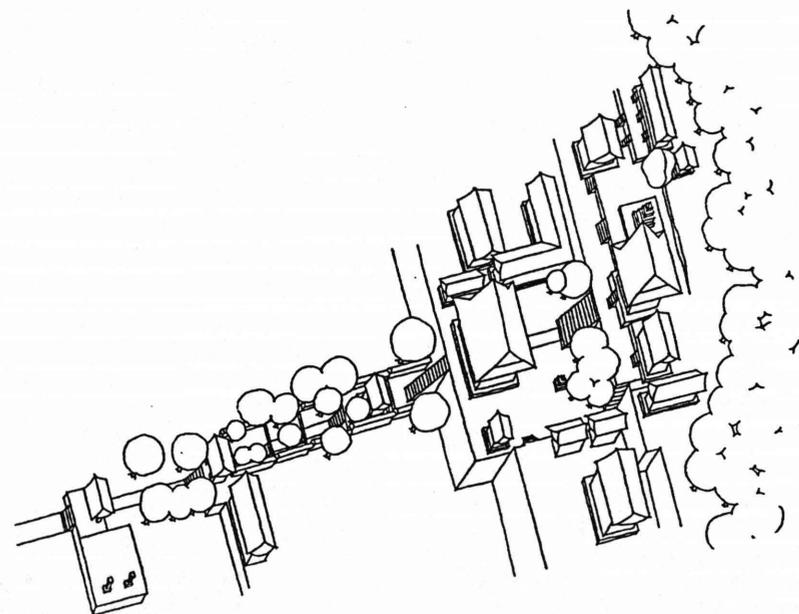
## Bumeosa



The big pavilion screens the next, main space. It makes the transition between spaces clear. The main space is divided into two smaller spaces by a big level change. The lower space is surrounded with buildings. It has a stone tower and a lantern at each side of the axis. Big steps on the axis lead to the higher space.



This space locates the main hall on the axis. Buildings in this space are erected on platforms and are designed to be reached by short flights of steps. Here the view opens to the surrounding mountains. Both higher and lower spaces have some minor spaces on slightly higher levels. Thus, they are visually identified as their own ground levels.



Bumeosa is located on moderate slopes in the mountains. The temple site starts from a gate, after a long and wooded path in the forest. Immediately after the gate, a series of processional spaces begins. It is a linear corridor, defined by trees and walls. It has three successive gates. The ground changes levels at every 20 to 40 feet. The last and highest level change marks the end of the processional space.

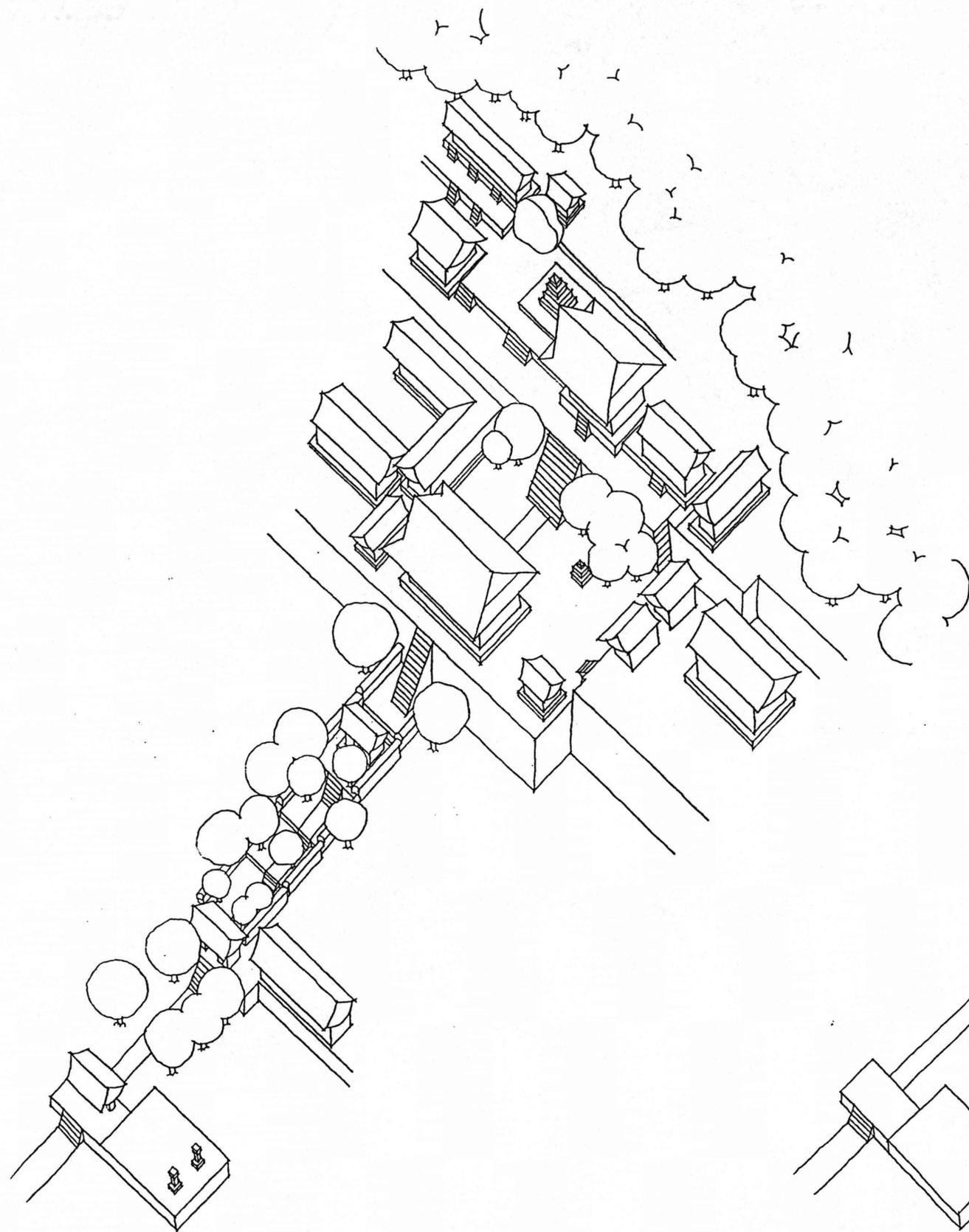


Figure 13. Bumeosa (Overview)

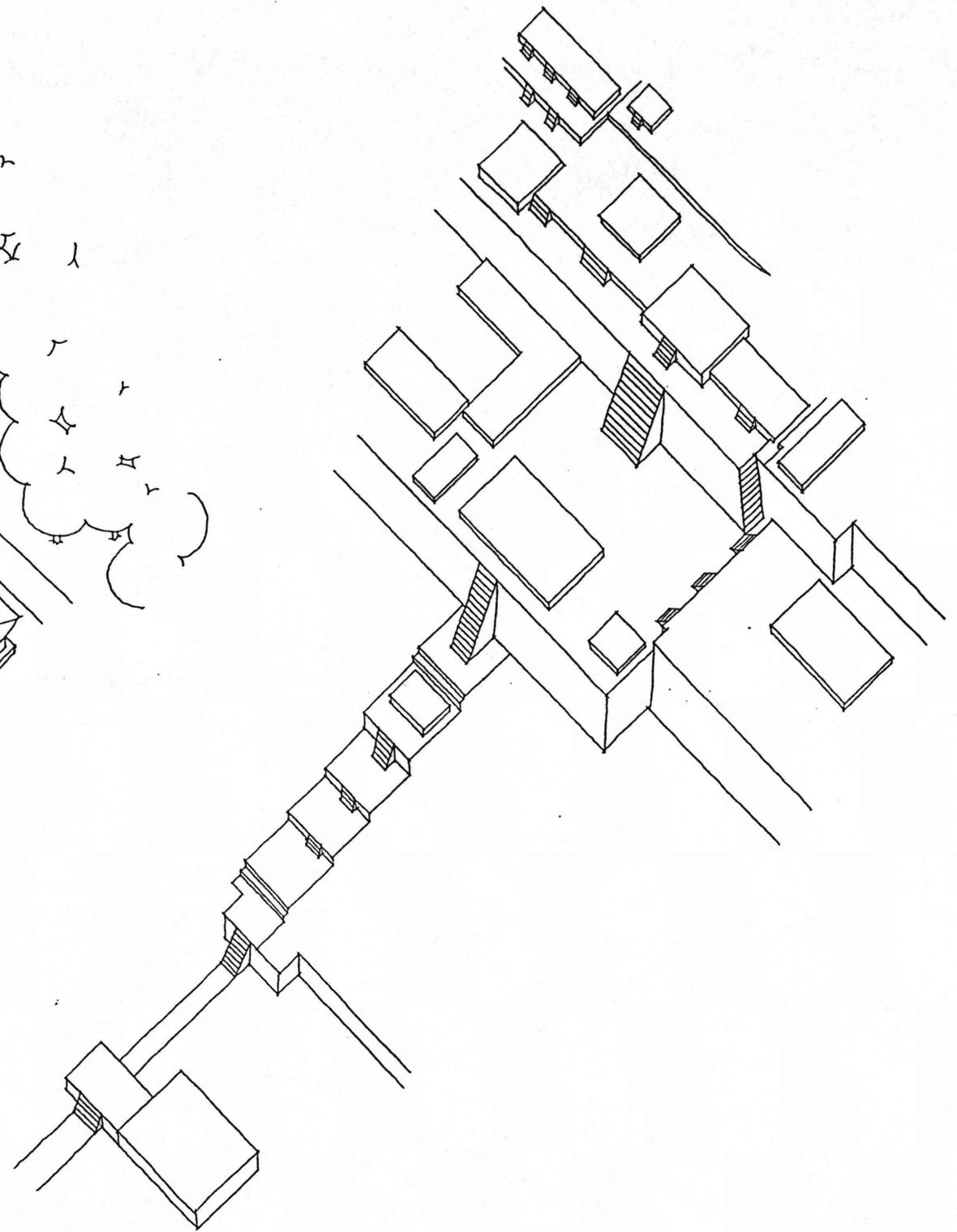
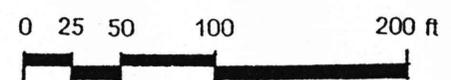


Figure 14. Bumeosa (Terraces)



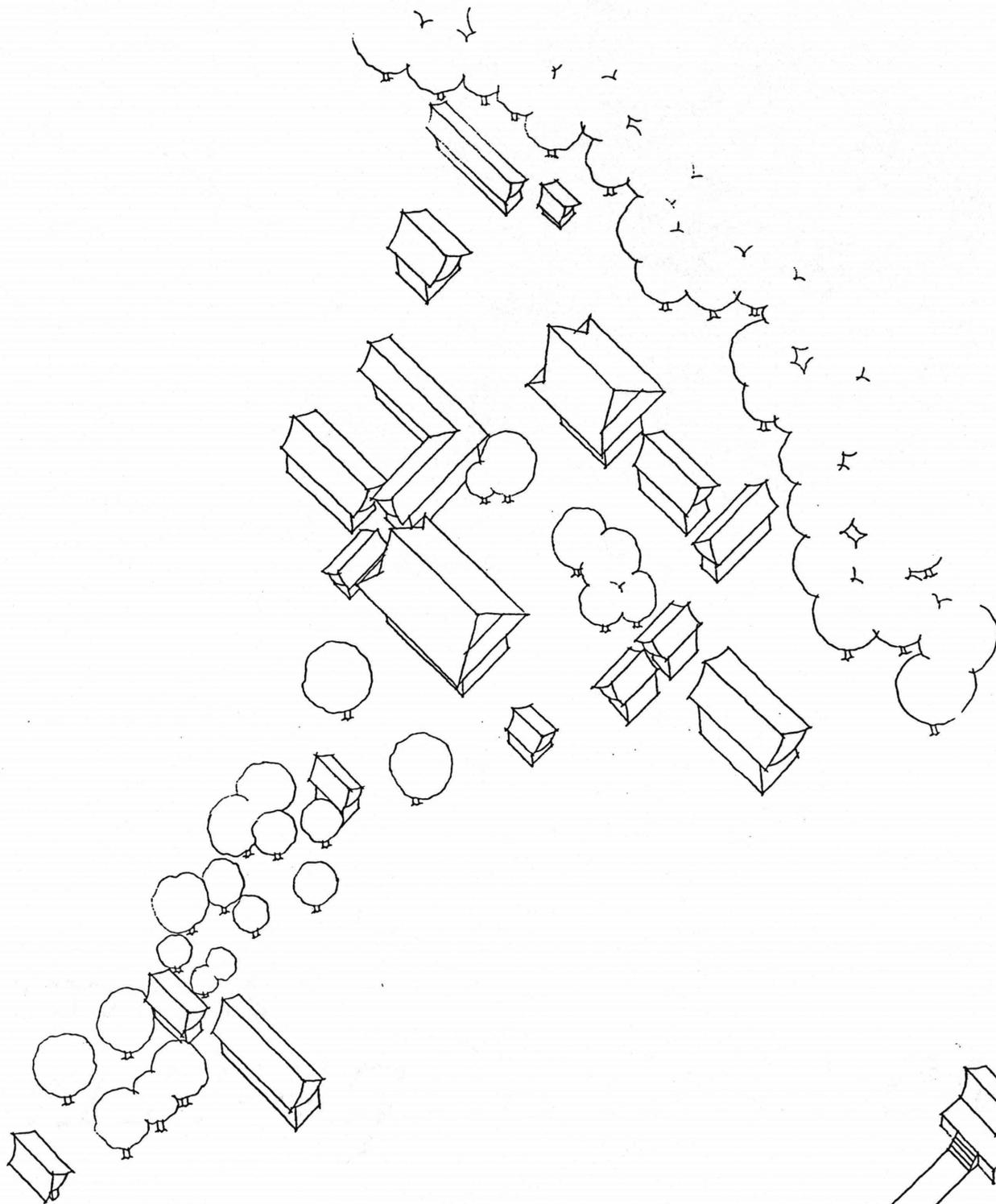


Figure 15. Bumeosa (Buildings and Vegetation)

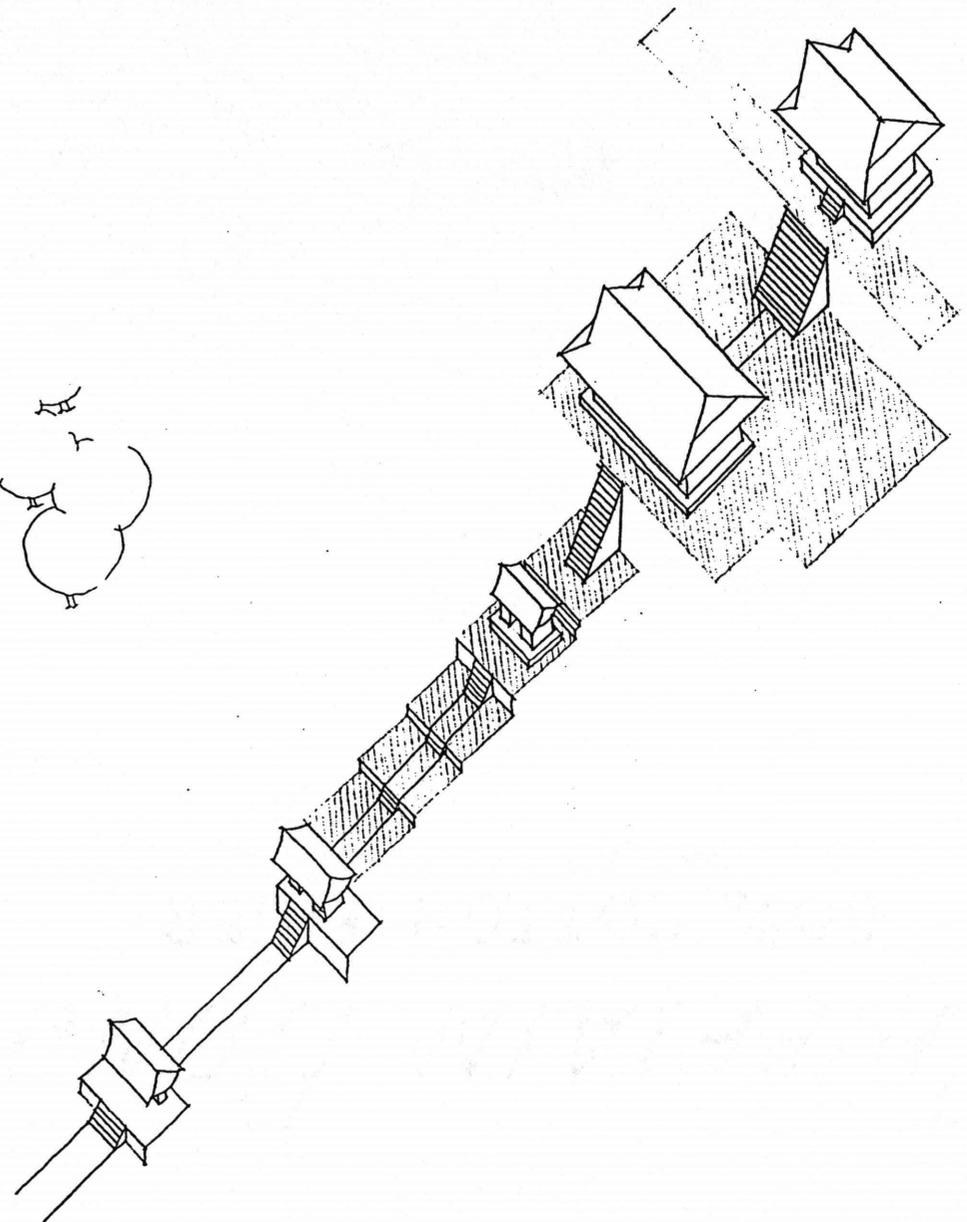
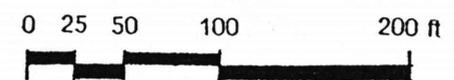
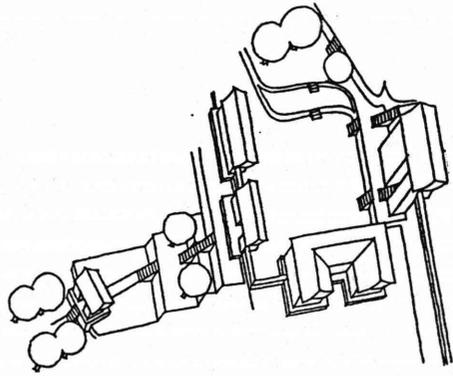


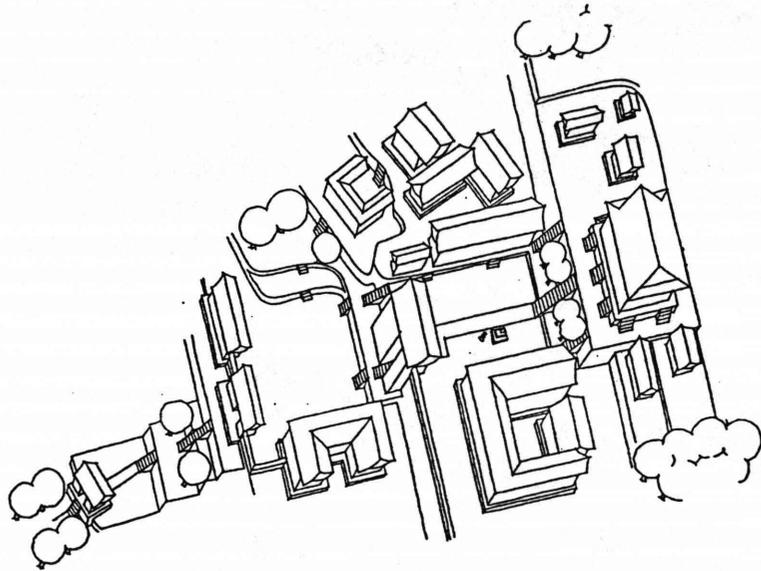
Figure 16. Bumeosa (Major Paths and Transition Places)



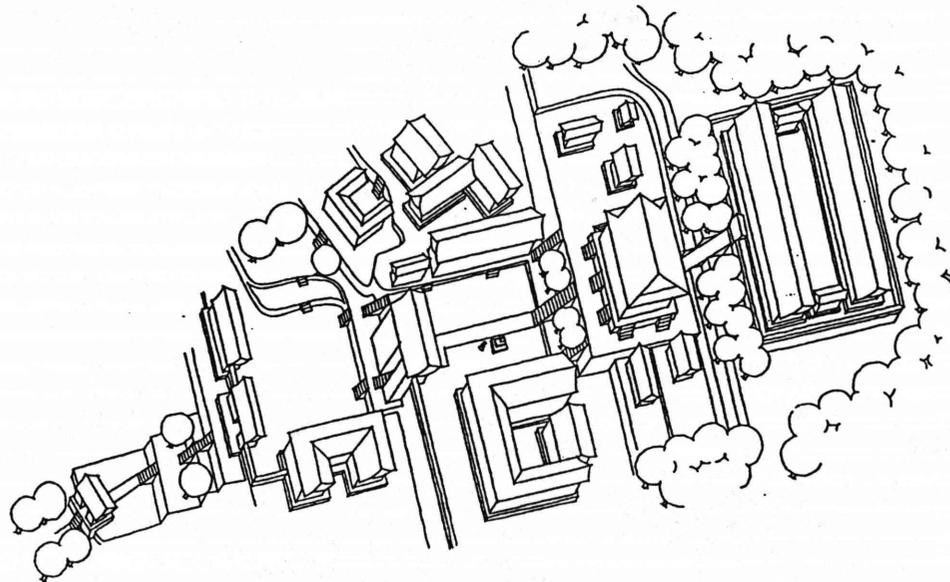
## Haeinsa



Haeinsa is located on a steep slope of a mountain. The processional space between gates is a long, shaded path. The ground rises moderately. A gate combined with steps defines each entrance. At the end of the processional space, steps continue up into a pavilion and thus lead the path through the building to the next space. Here, the main space is completely screened by the pavilion and walls, except the opening for the stairways.



The main space is also divided into two by a large topographic change. The lower space is enclosed with buildings and only at the pavilion is the outward view open. The upper space is accessed by three flights of steps and provides a good open view. On the axis of this space is the main hall, erected on a platform, surrounded by seven flights of steps. Two minor spaces are at the sides of the main hall.



At the back of the hall is an isolated space on a high terrace. It is a sacred storage area for religious books. High steps and an entrance gate mark the transition into this special space.

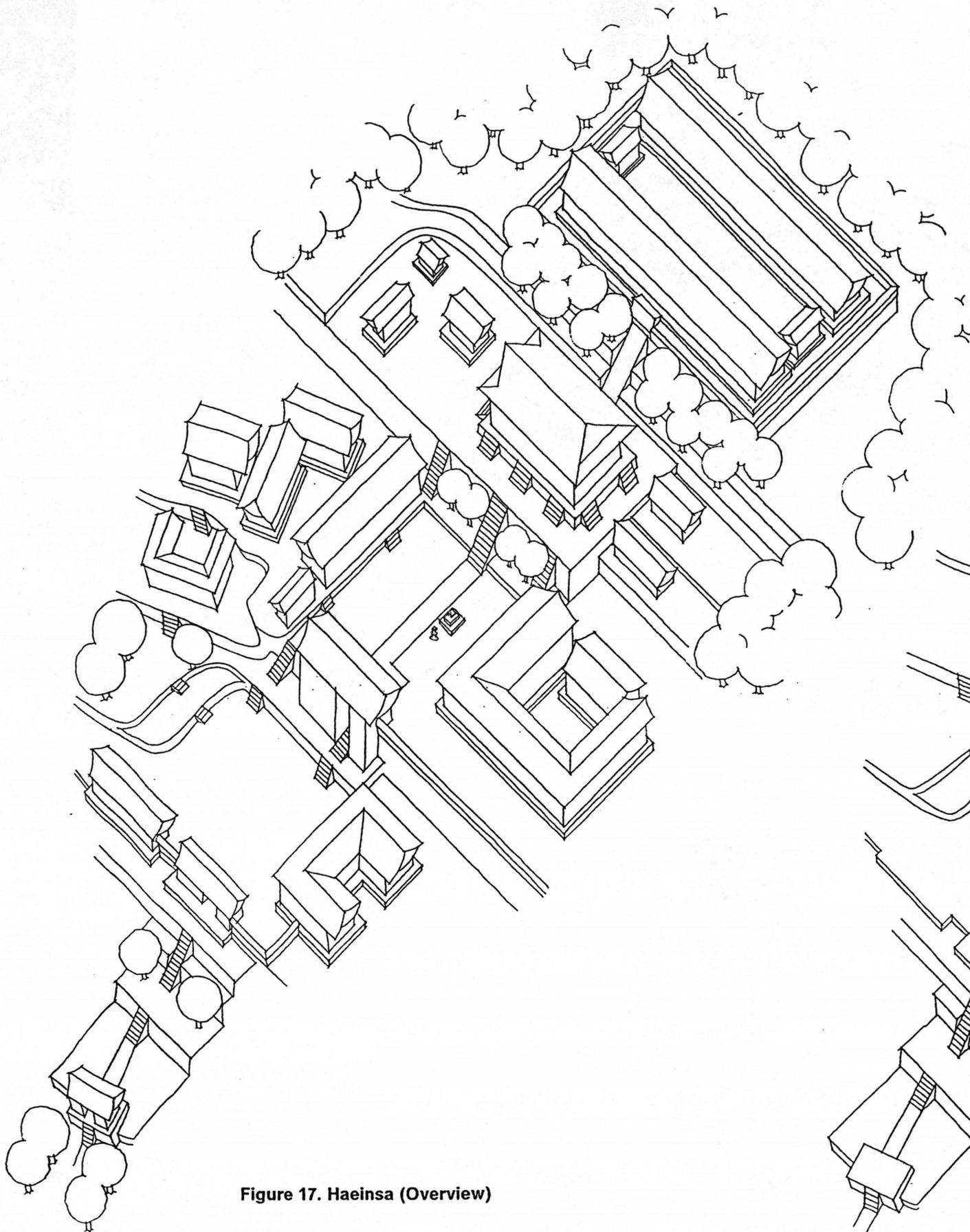


Figure 17. Haeinsa (Overview)

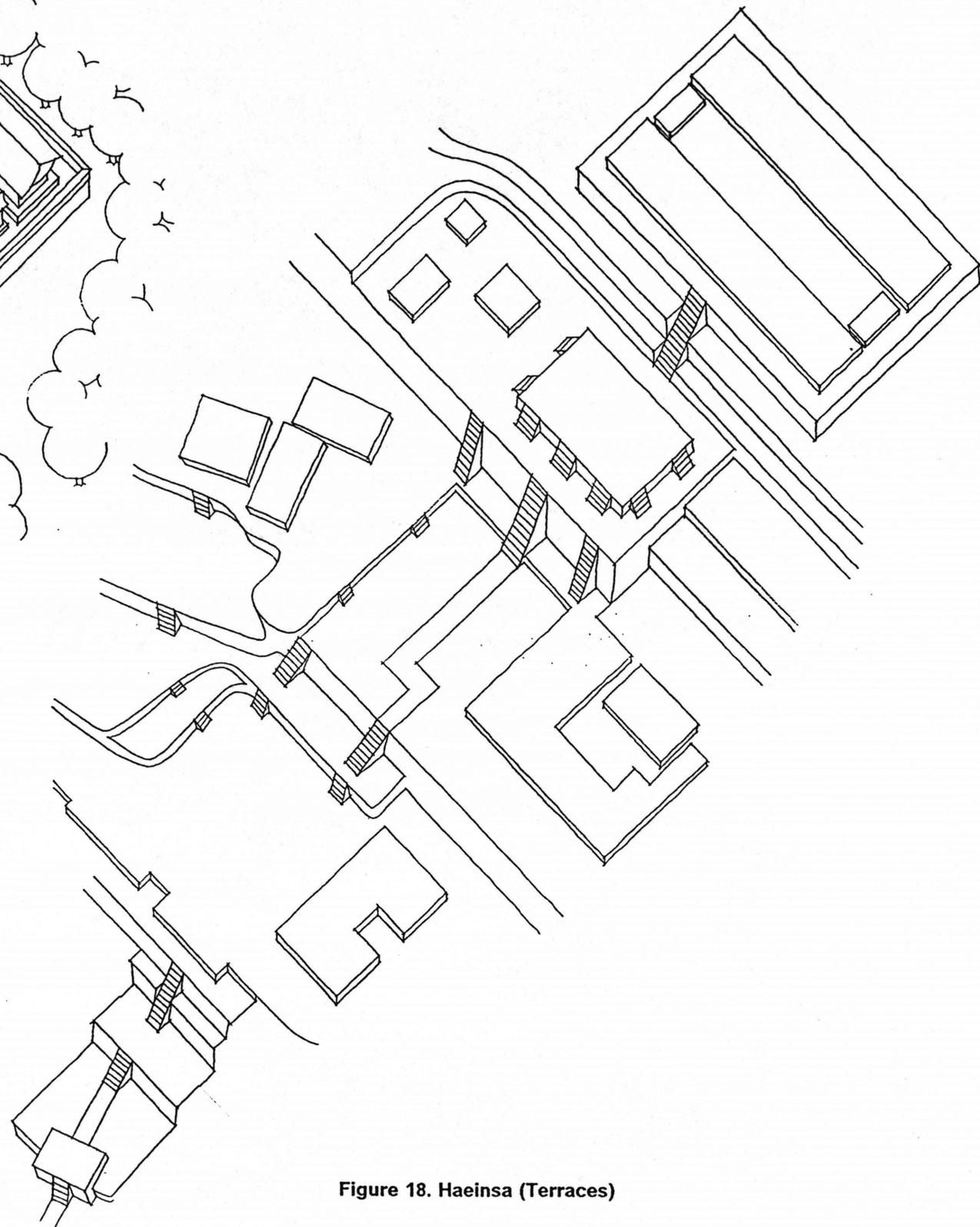
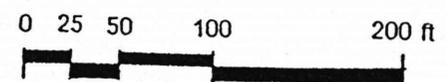


Figure 18. Haeinsa (Terraces)



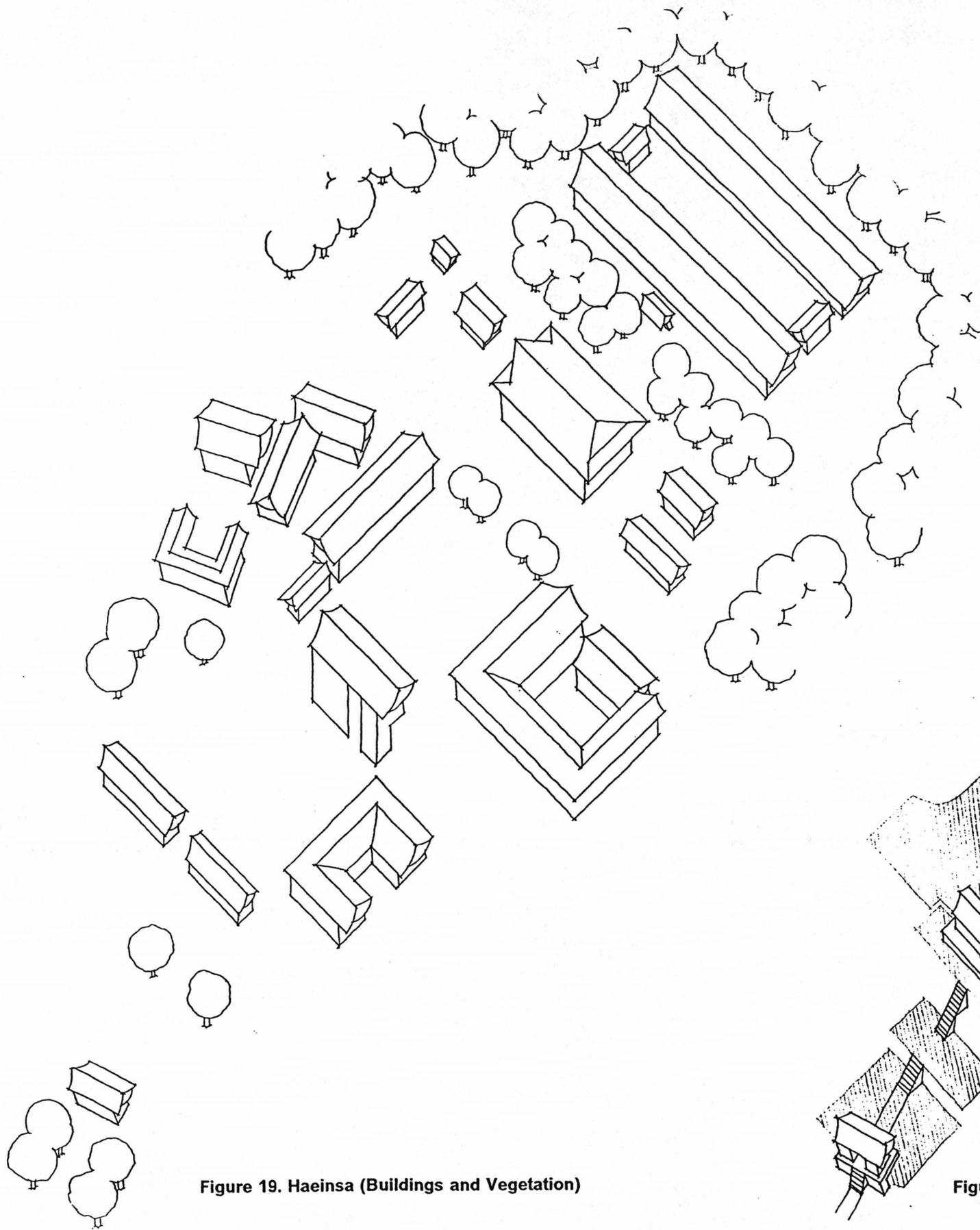


Figure 19. Haeinsa (Buildings and Vegetation)

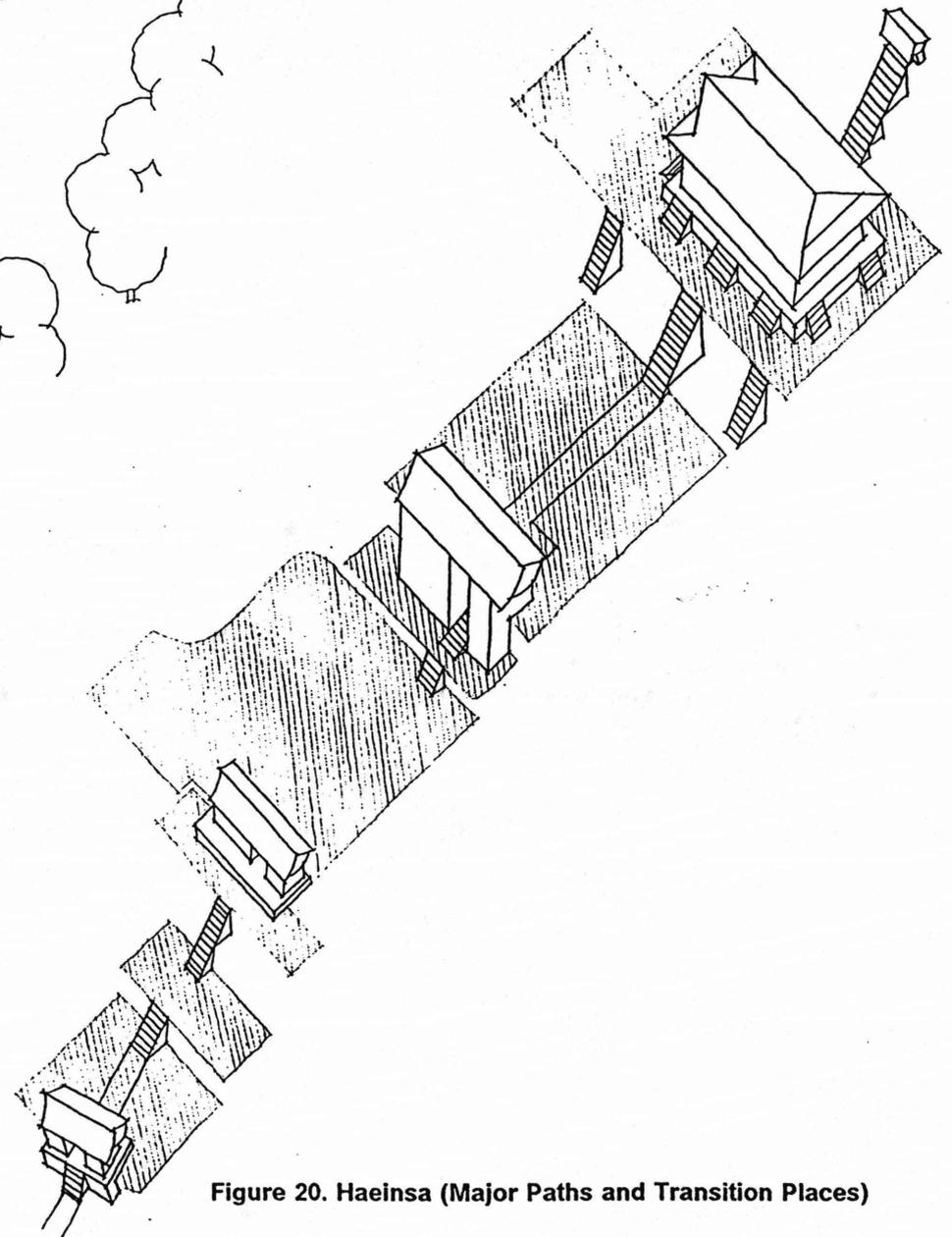
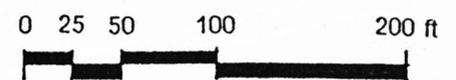
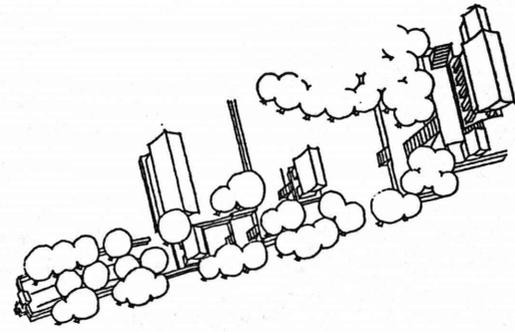


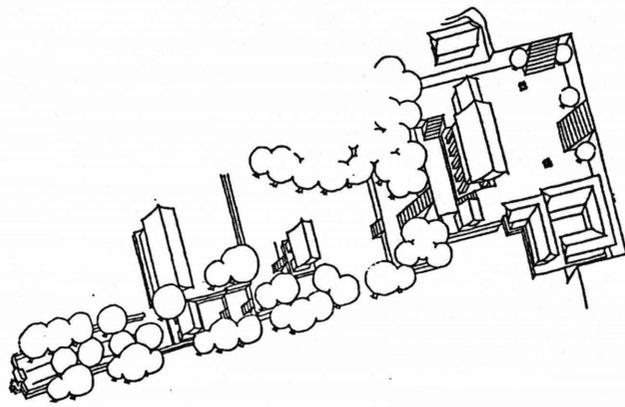
Figure 20. Haeinsa (Major Paths and Transition Places)



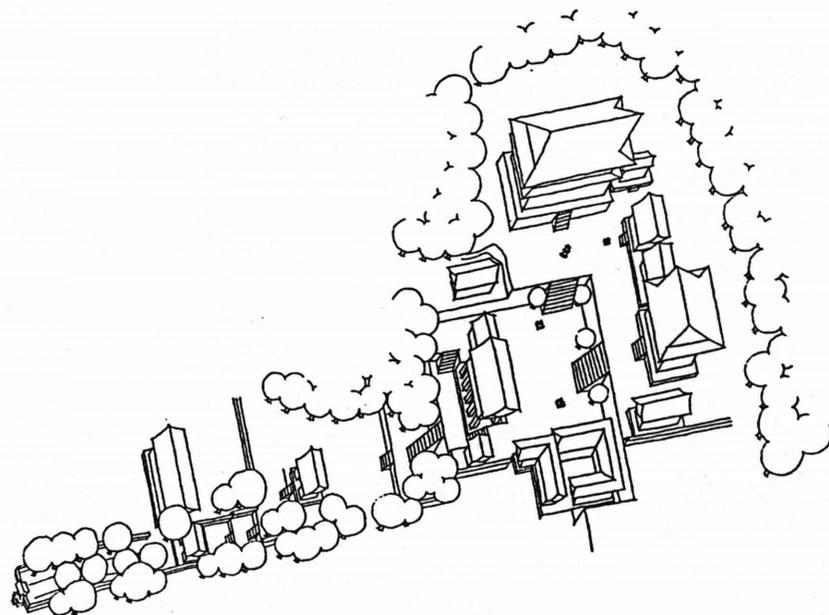
## Hwaumsa



Hwaumsa is located on the steep slope of a mountain. It also has three gates in the processional space. The space between the first and third gates is a narrow corridor enclosed by trees and walls. The ground level rises constantly. After the third gate, the space widens and the level changes more radically. At the end of this space is a big pavilion which screens the forward space completely. Steps at the sides of the pavilion lead to paths to the main space.



The main space is divided in two by a topographic change. After the pavilion, every element in these spaces becomes larger in scale—the size of the spaces, the height of the terrace, the width of the steps and the scale of major buildings.



The upper space is L-shaped and holds important buildings, including the main hall. It provides a good mountain view. Two large flights of steps connect these spaces.

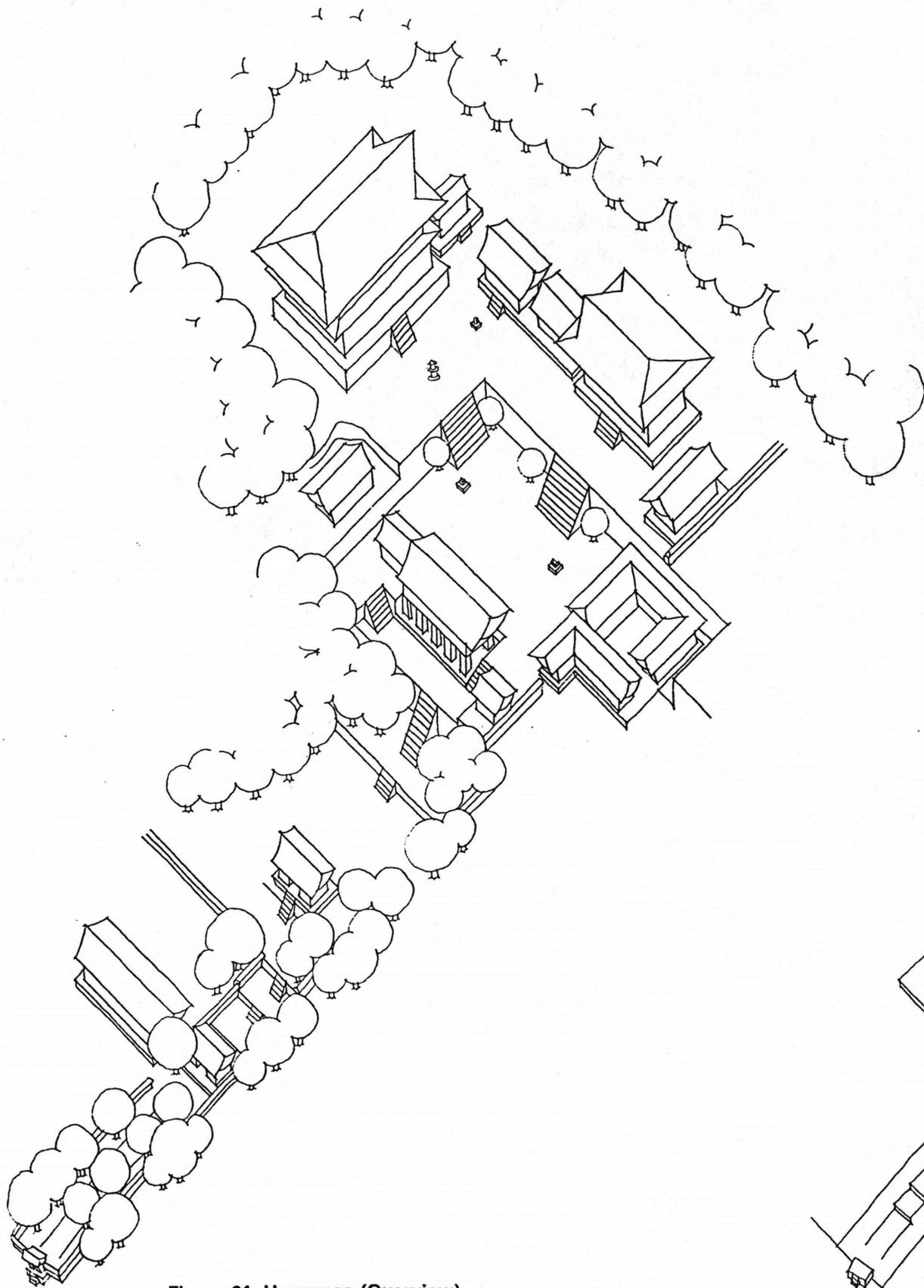


Figure 21. Hwaumsa (Overview)

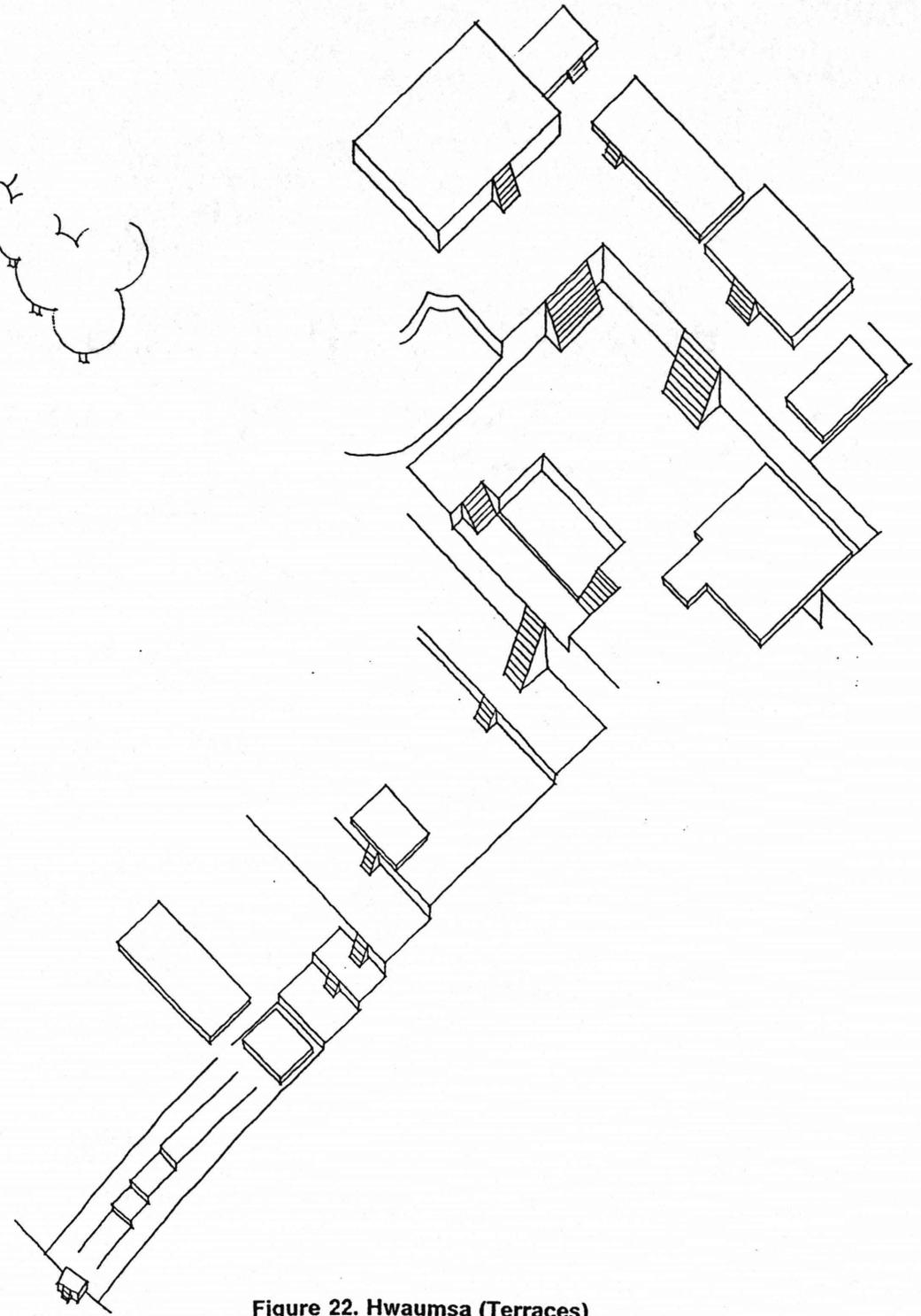
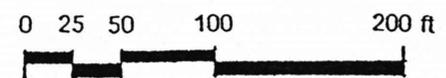


Figure 22. Hwaumsa (Terraces)



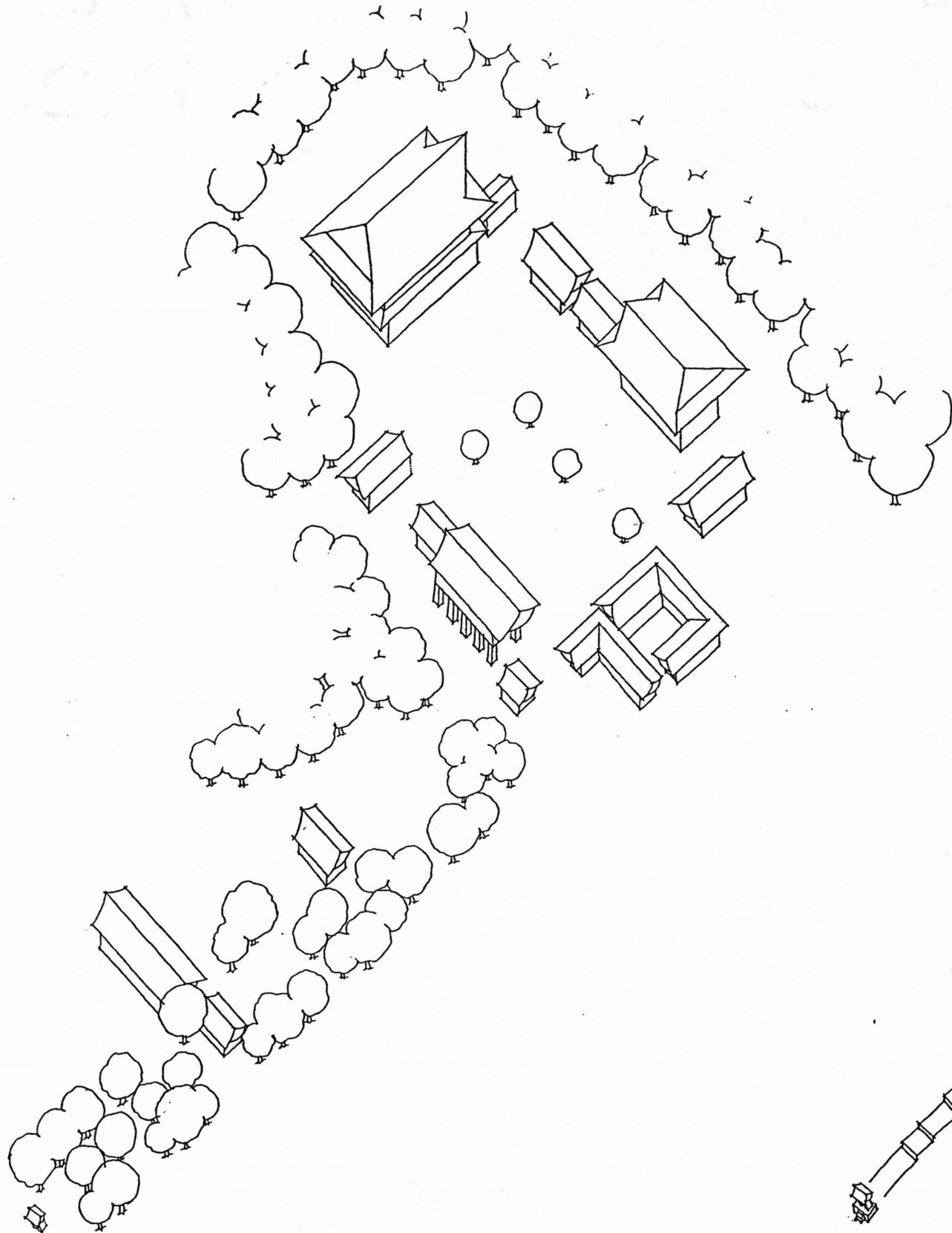


Figure 23. Hwaumsa (Buildings and Vegetation)

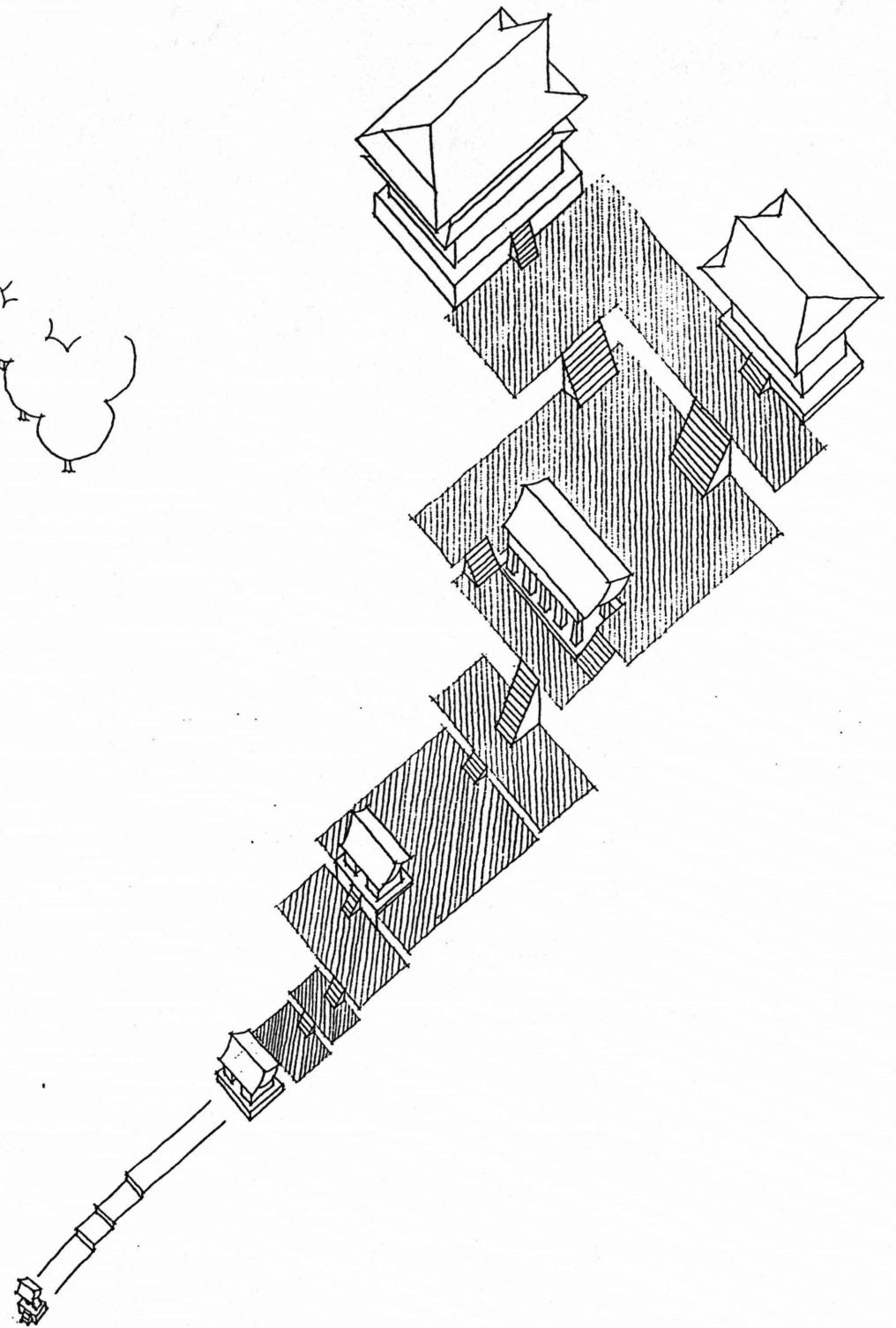
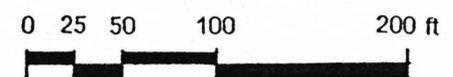
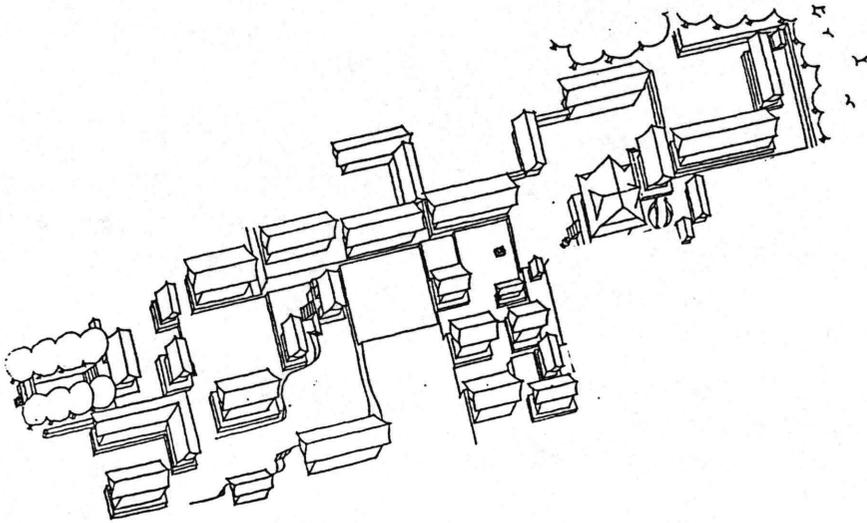
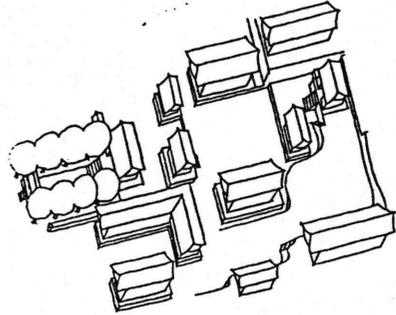


Figure 24. Hwaumsa (Major Paths and Transition Places)

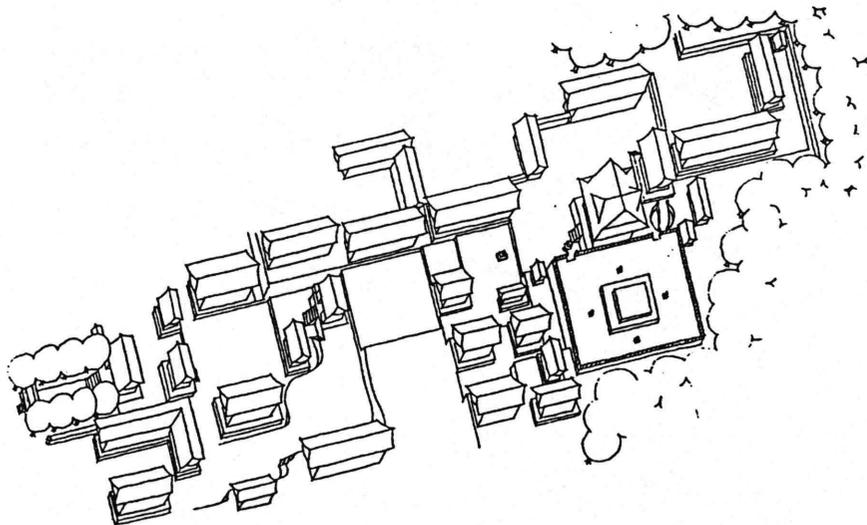


## Tongdosa

Tongdosa is located on a rather flat site on a mountain. A wooded path along a stream leads to a simple gate of pillars and a roof. The temple has three gates along the axis and has low level changes at each gate. The space between the first and the second gate is a narrow corridor. The space widens after the second gate and is surrounded by buildings. If not for the level change at the third gate, it might be hard to tell the boundary between the processional space and the main space.



The main space is a series of linear spaces enclosed by buildings. The ground level rises slightly toward the main hall, with the hall located on a higher ground. The space is extended to the south of the main hall and further leads into a tiny minor space at the corner.



At the back of the main hall is a sacred space with Sari Tower at the center. This is planned so that the Tower is located on the highest area in the temple and can only be reached by high steps. Walls separate it from the other spaces.

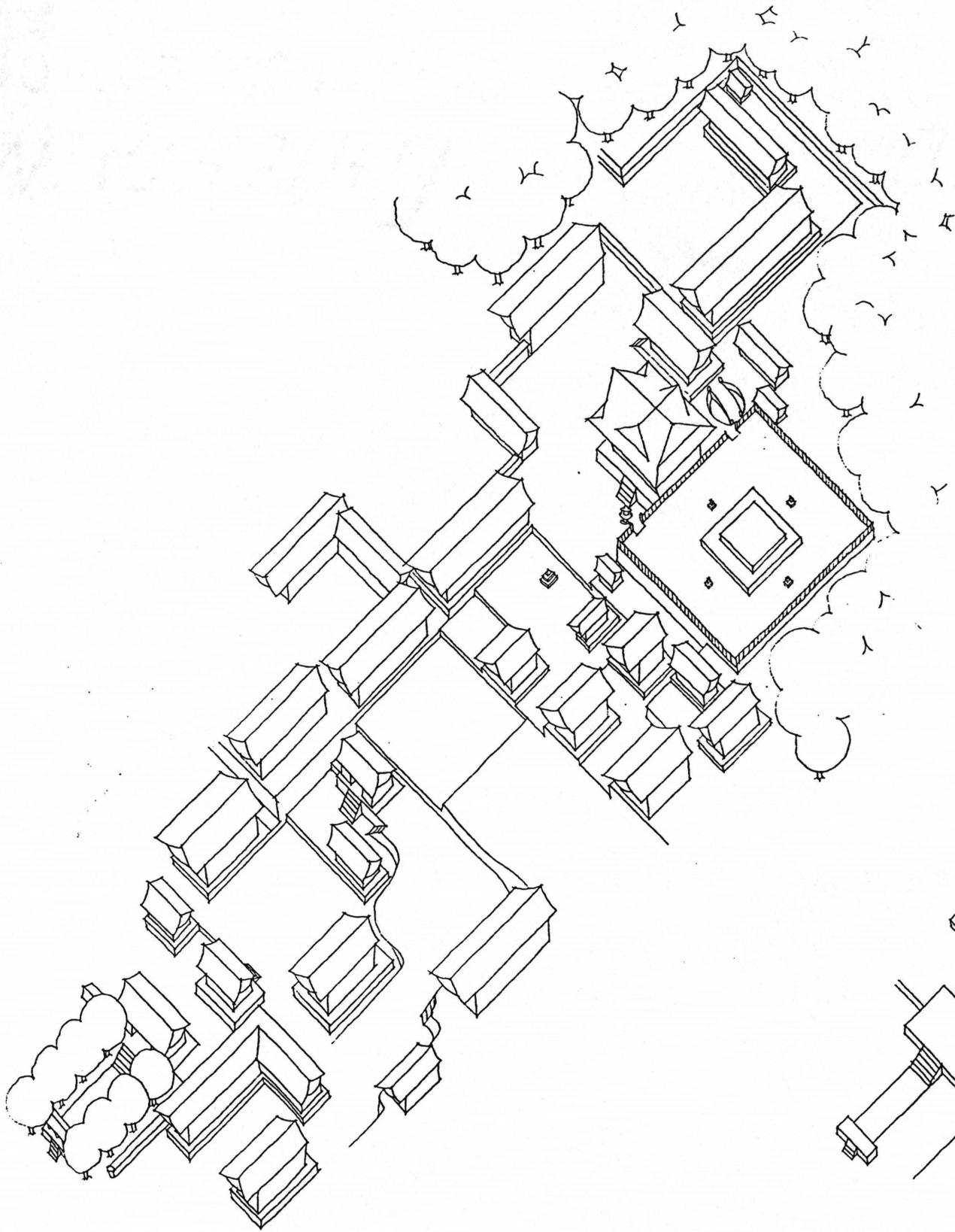


Figure 25. Tongdosa (Overview)

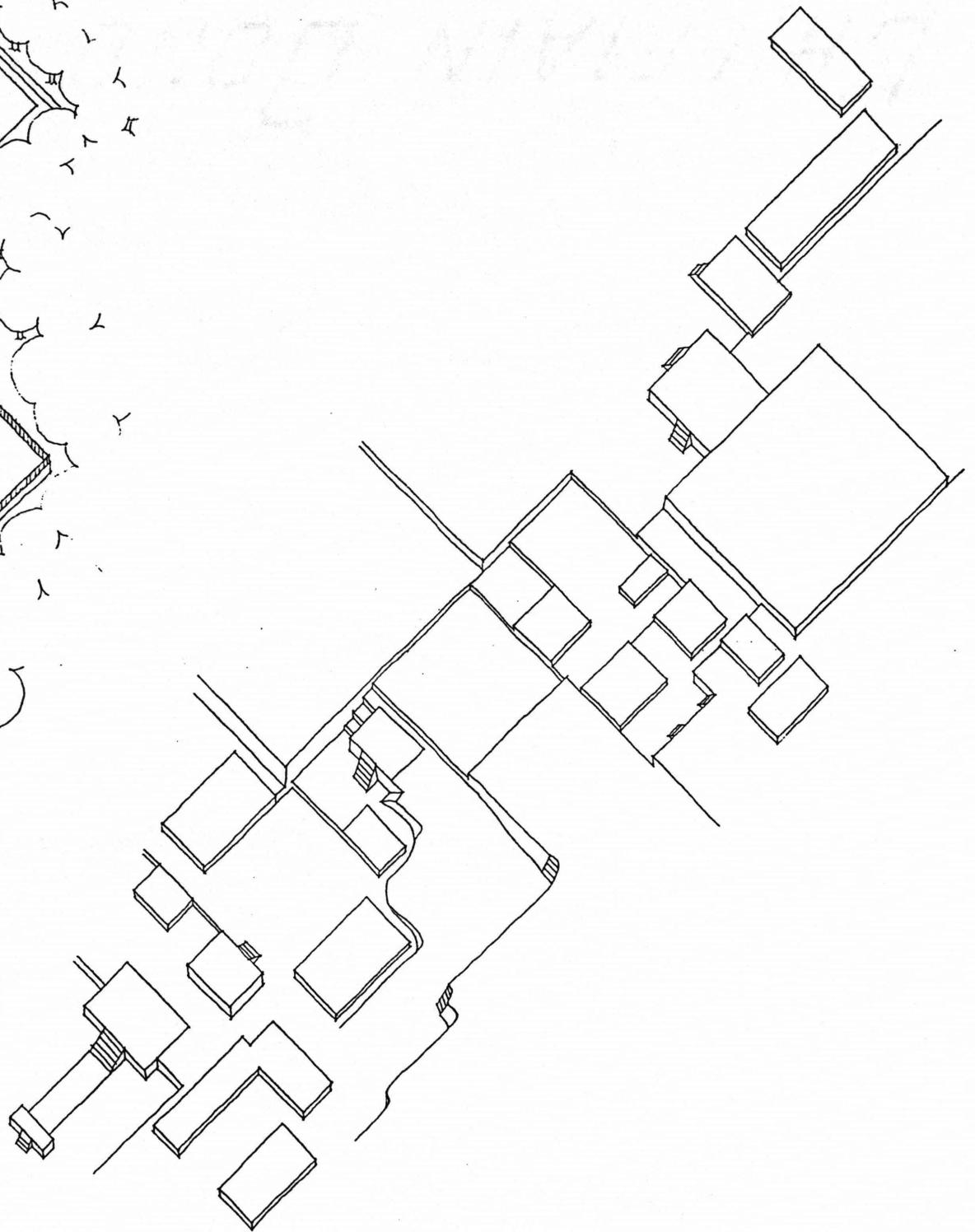
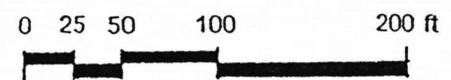


Figure 26. Tongdosa (Terraces)



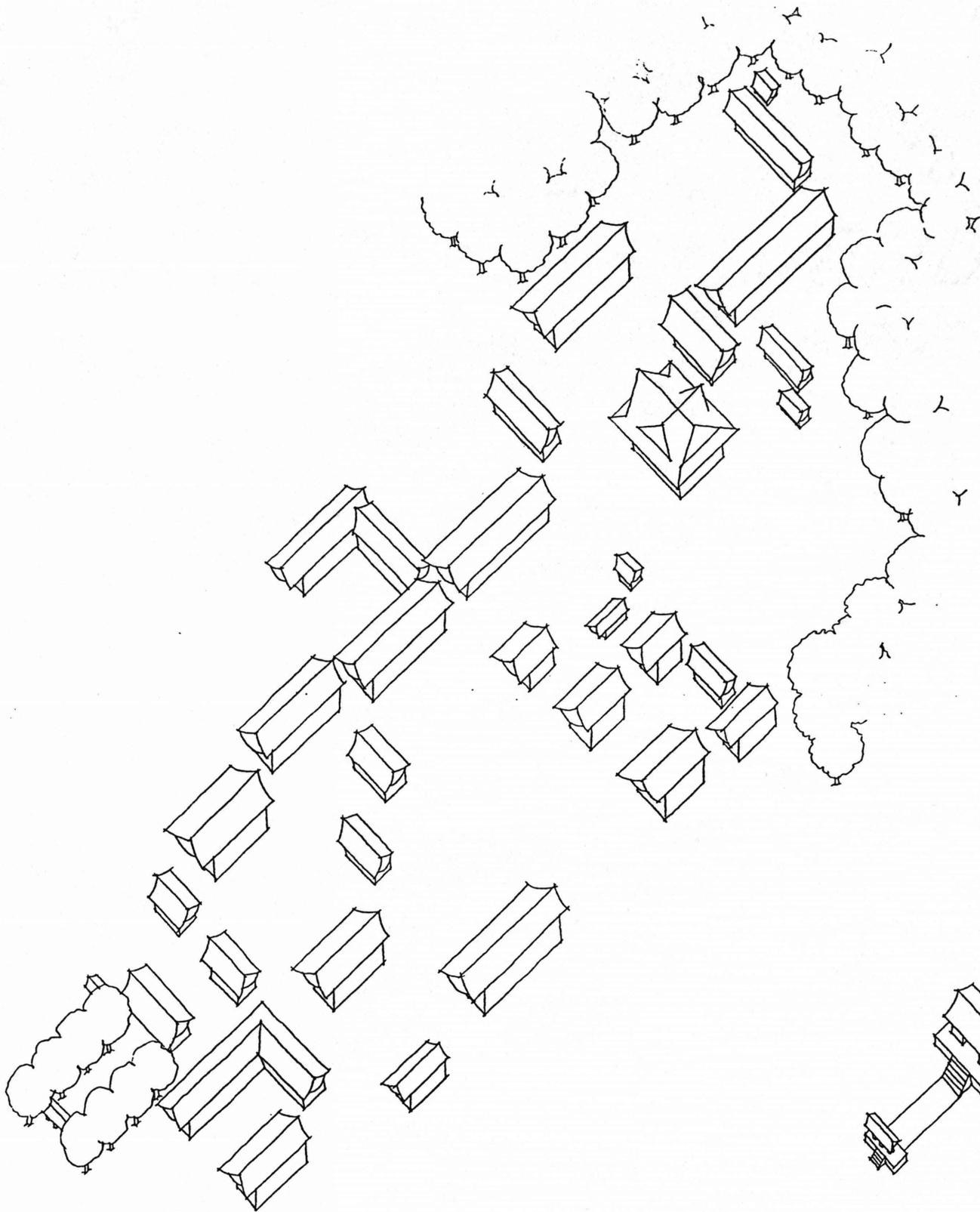


Figure 27. Tongdosa (Buildings and Vegetation)

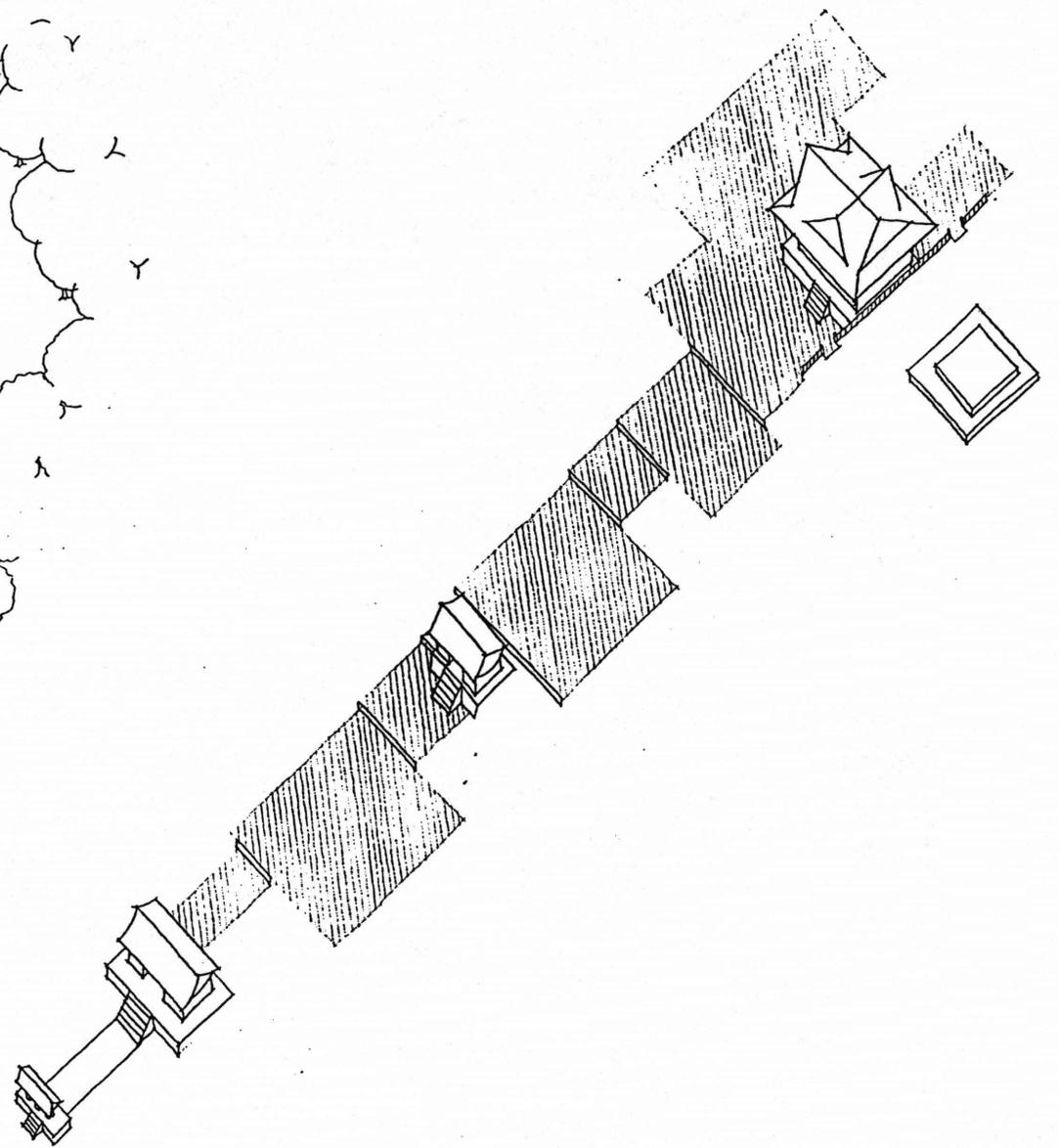
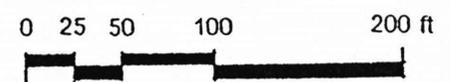
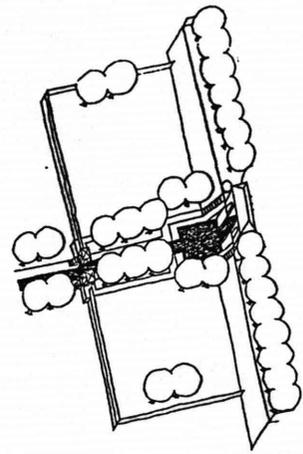


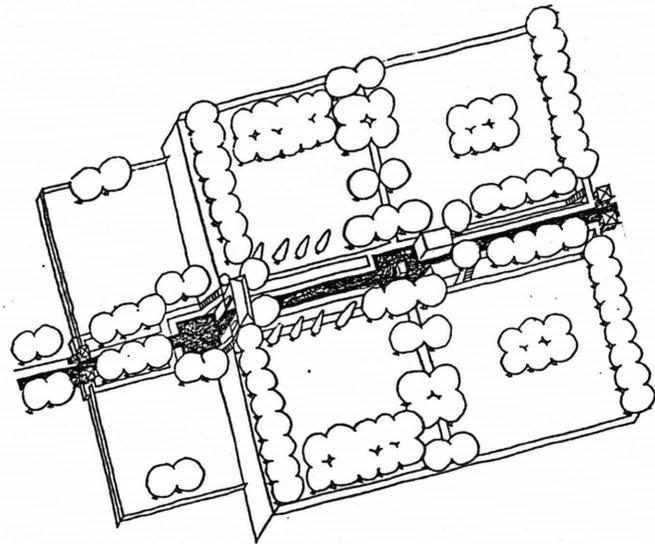
Figure 28. Tongdosa (Major Paths and Transition Places)



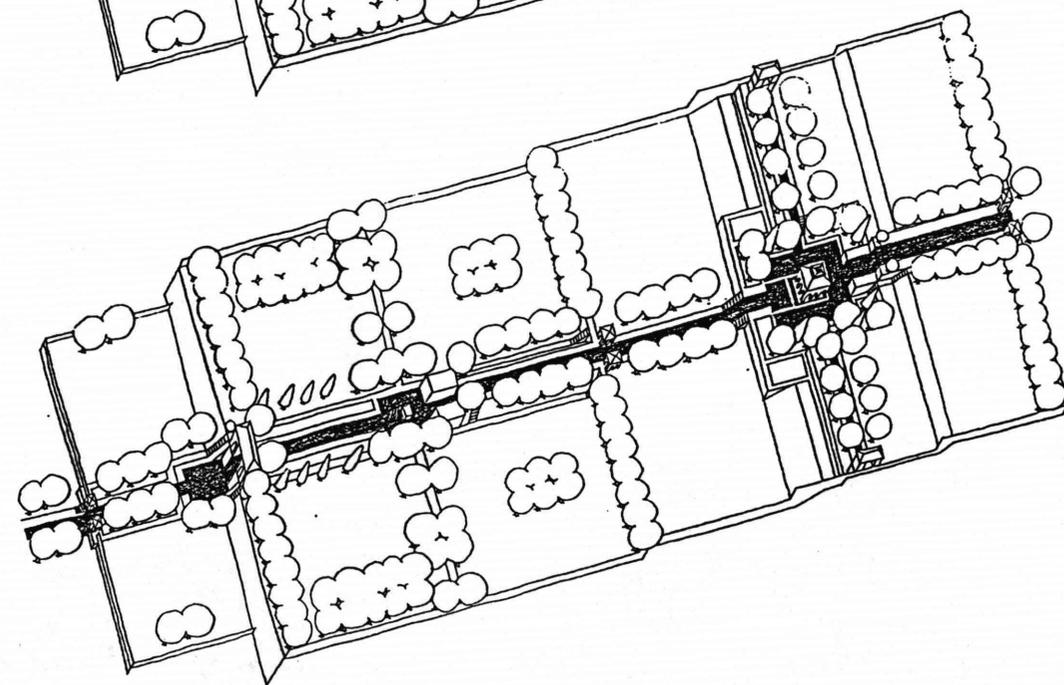
## Shalamar Bagh



Shalamar lies at the head of the canal and is approached by water. It is composed of three square gardens; the public garden, the emperor's private garden and the zenana garden. Its terraces are threaded together by a central water course that continues the line of the approach canal. Entry to the garden is at the lowest level. The first, public garden has a square water basin and a cascade on the axis. A pavilion and rows of trees on the high terrace screen the view to the next garden.



The canal continues into the private garden. The paths at the sides of the canal are heavily shaded by two lines of chenars. Beyond the trees are orchards. Two small pavilions at the end of the raised water canal guard the entrance to the zenana garden.



This garden has a stepped change of level in the middle. At the center of the garden stands a black marble pavilion. It can only be reached by two causeways. Behind the pavilion, a double cascade falls over low walls honeycombed with pigeon-holes. Here, every level change is used to accentuate the downward water movement.

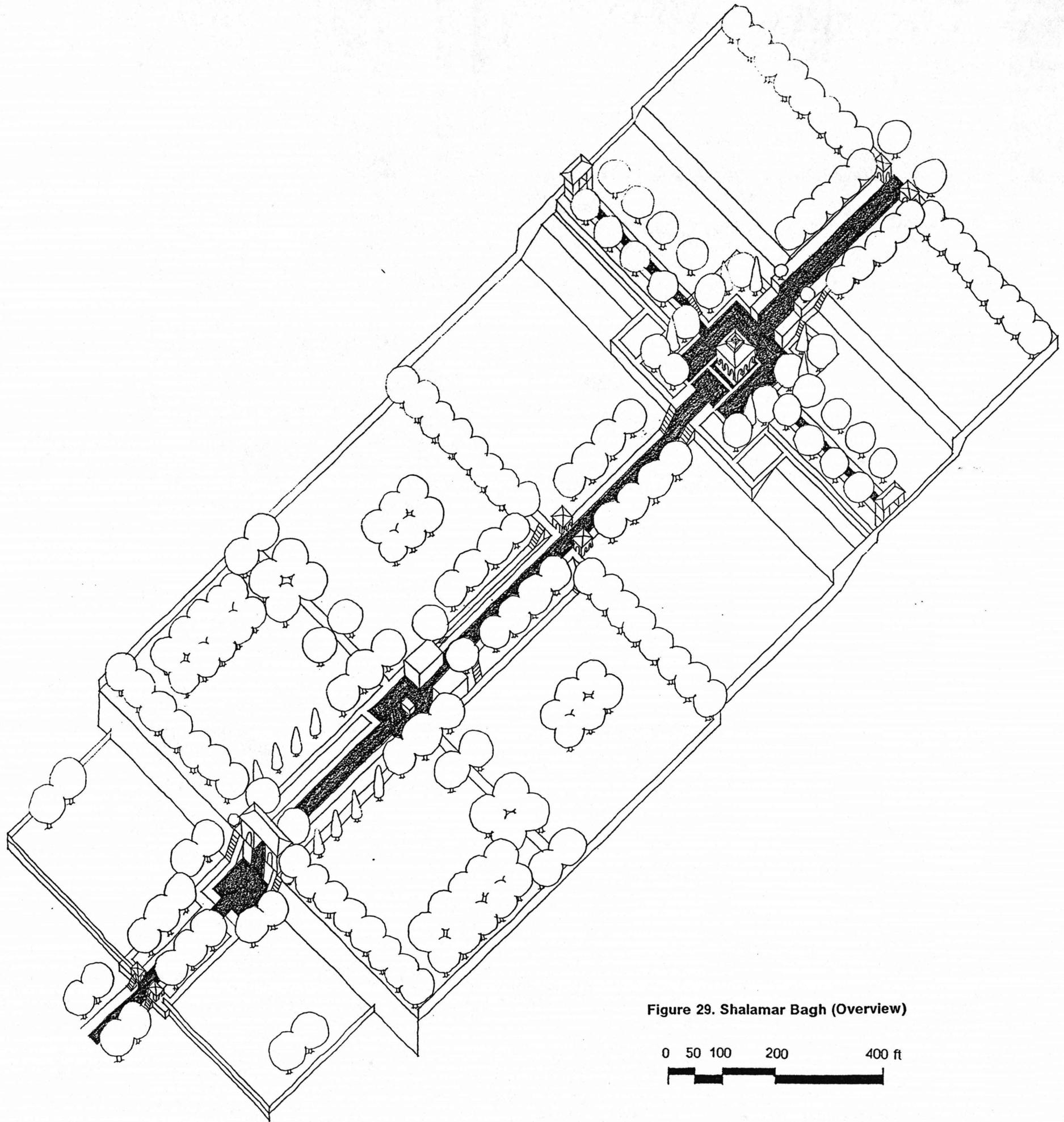
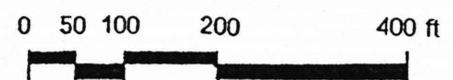


Figure 29. Shalamar Bagh (Overview)



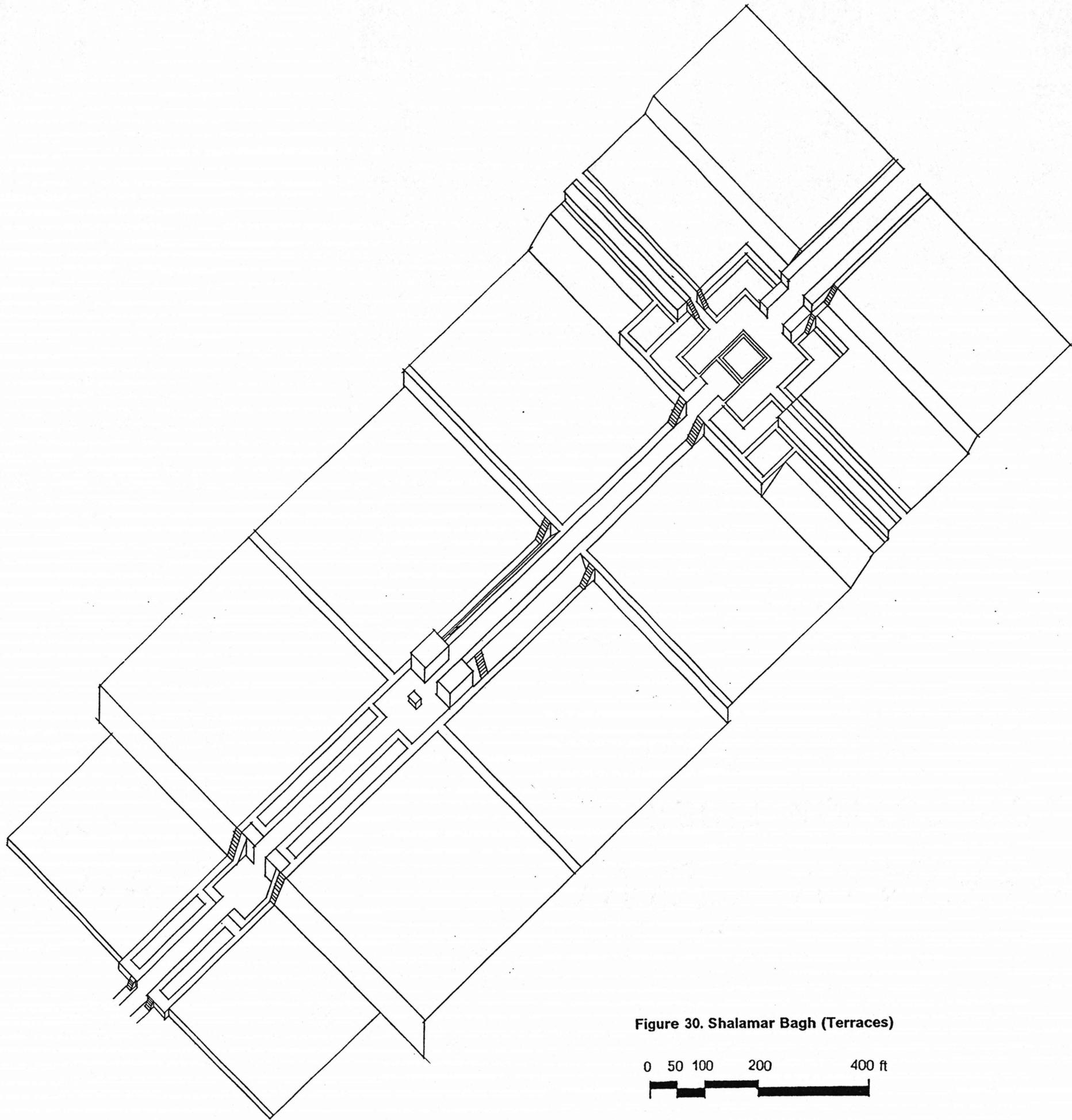
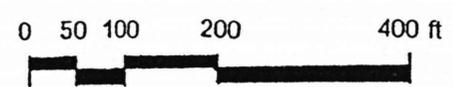


Figure 30. Shalamar Bagh (Terraces)



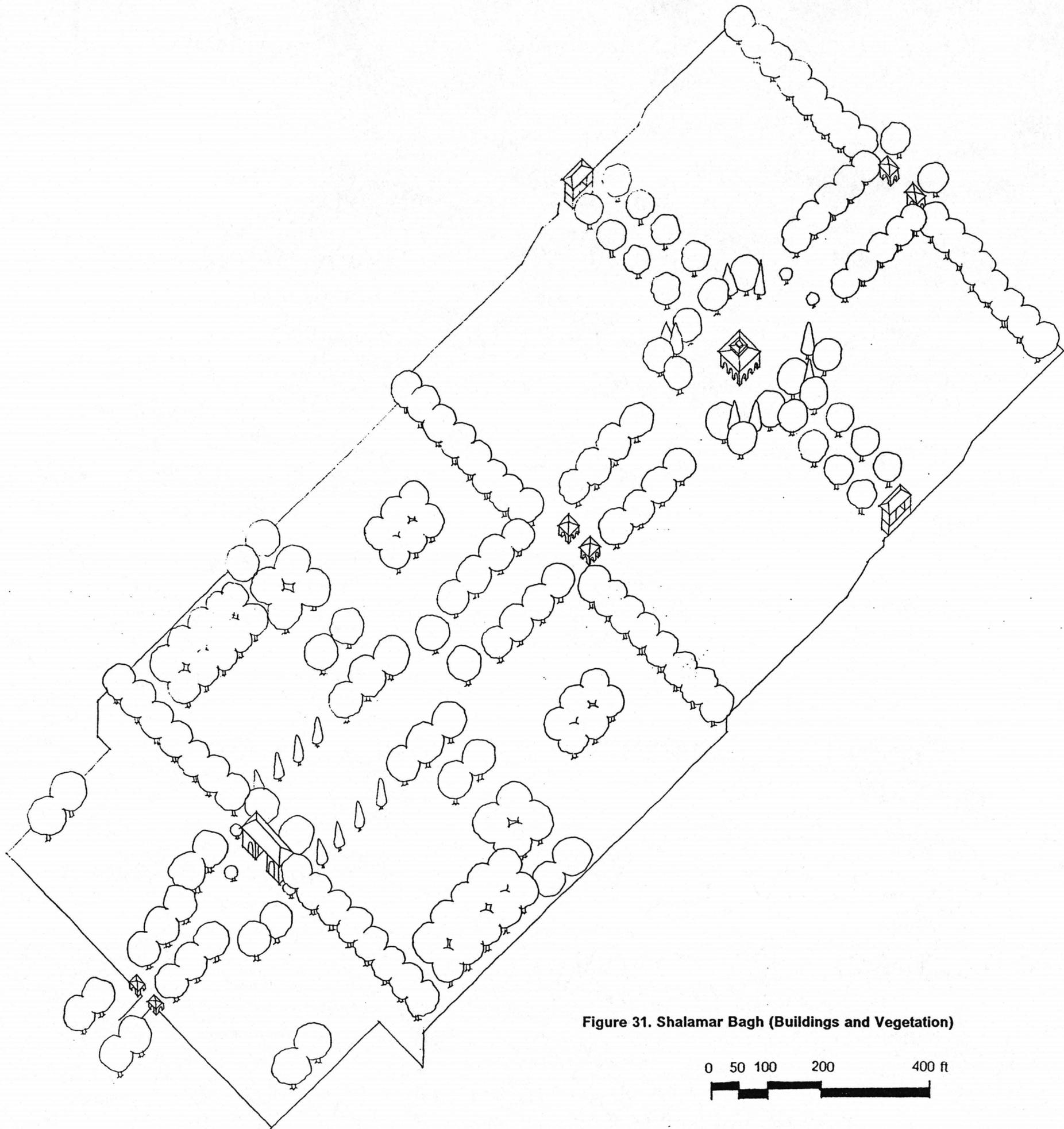
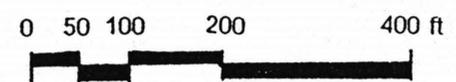


Figure 31. Shalamar Bagh (Buildings and Vegetation)



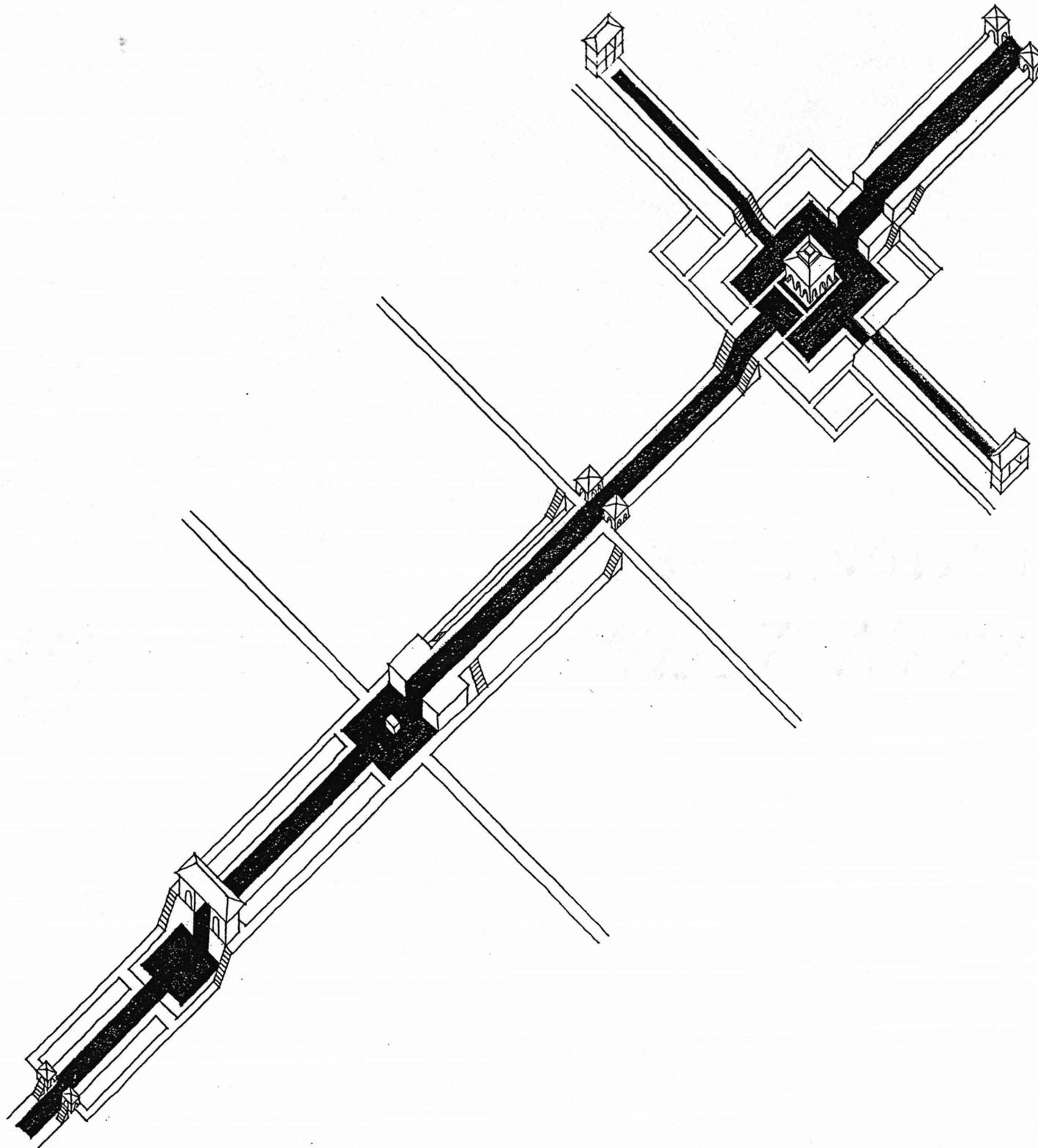
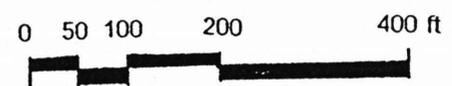
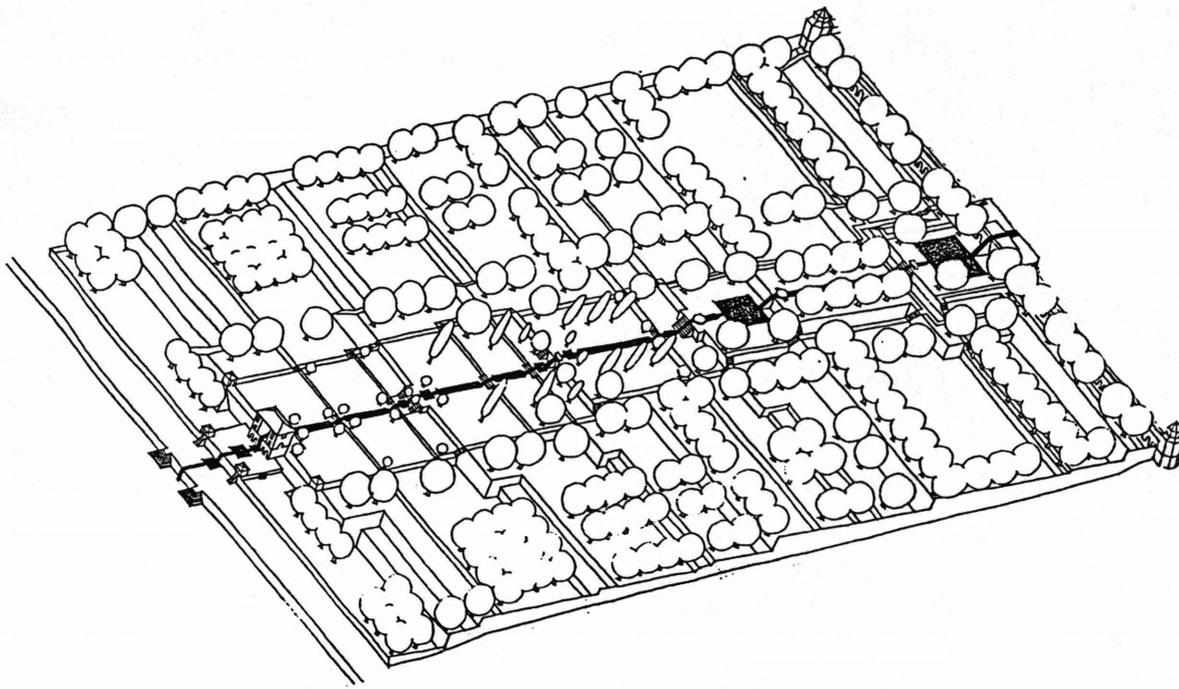


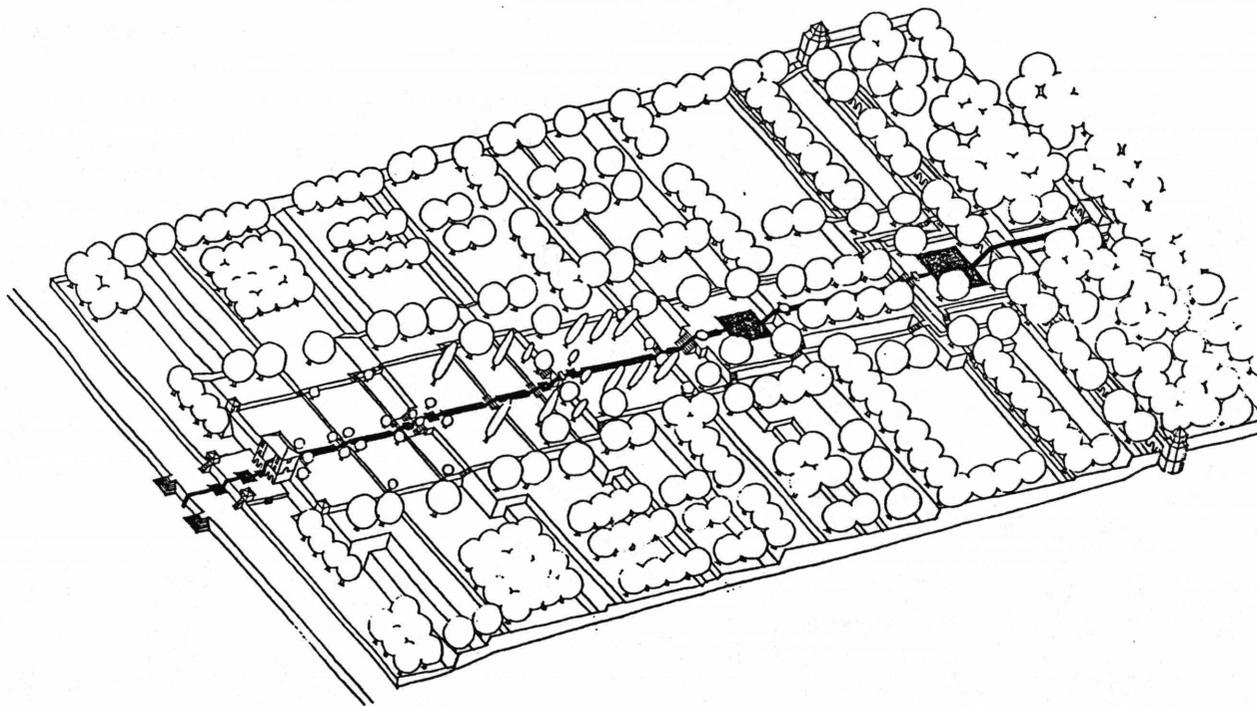
Figure 32. Shalamar Bagh (Major Paths and Transition Places)



## Nishat Bagh



Nishat Bagh is approached by boat and is designed to be seen from water level. It is situated upon an impressive progression of terraces to the background mountains. There were once twelve terraces, one for each sign of the Zodiac. Now the bottom terrace is cut off by the modern road. Since Nishat Bagh was not a royal garden, there are two divisions only; the pleasure garden and the zenana terrace. The pleasure garden is the major part of the garden. The main feature is the great central water course, approximately 13 feet wide. It is treated as a series of canals, each dropping by a cascade to the terrace below. The canals are full of fountain jets, and each change of level is modelled and accentuated by a water chute, by flights of steps, by reflecting pools, or by a number of stone and marble thrones placed across the water.



The zenana terrace on the top is separated from the rest with a large change in level. The retaining wall of the zenana terrace is nearly 20 feet high and running across the full width of the garden. The wall is faced with a series of repeating arches and has three-story gazebos at either end. Here, the whole countryside comes into view, unhindered.

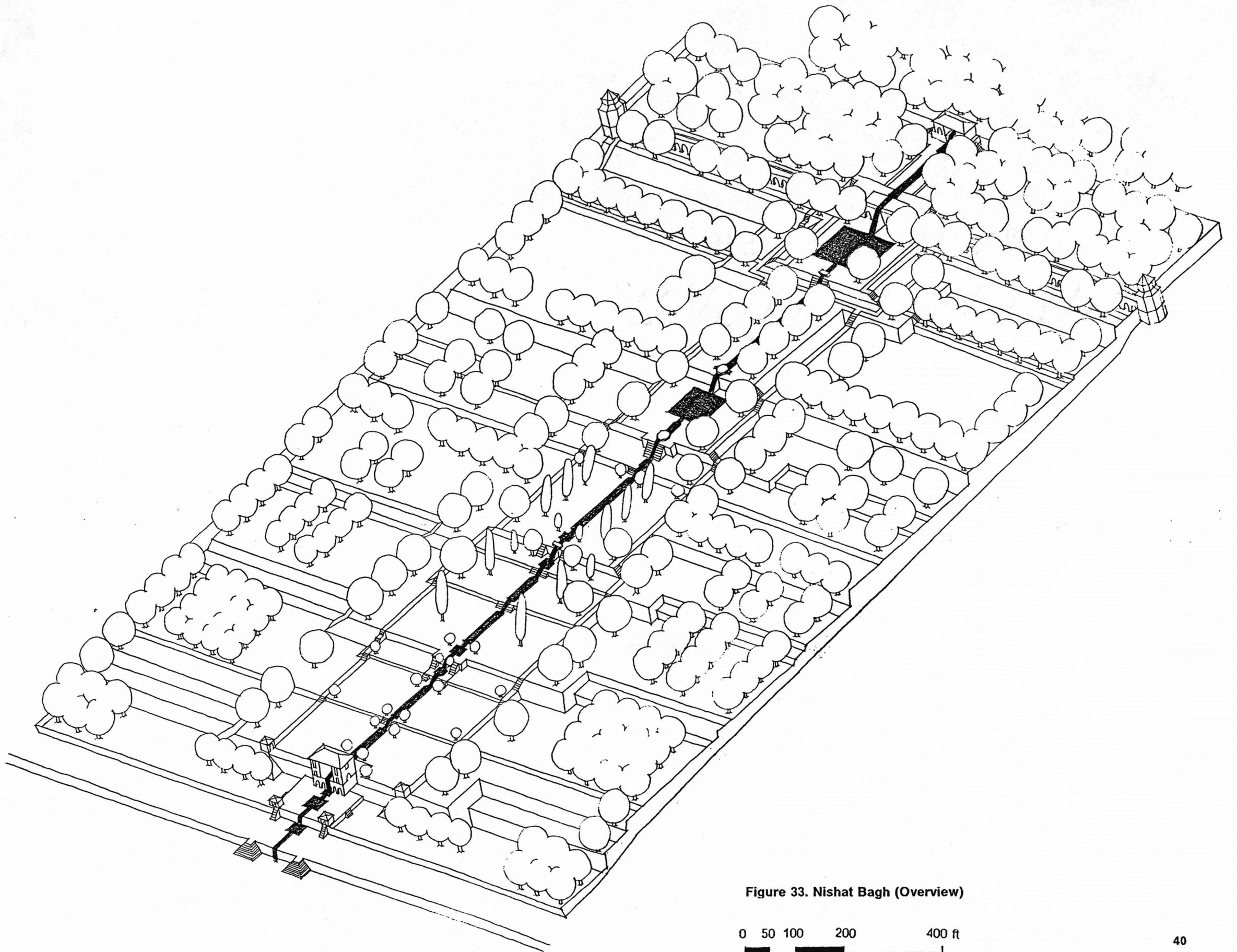
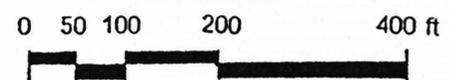


Figure 33. Nishat Bagh (Overview)



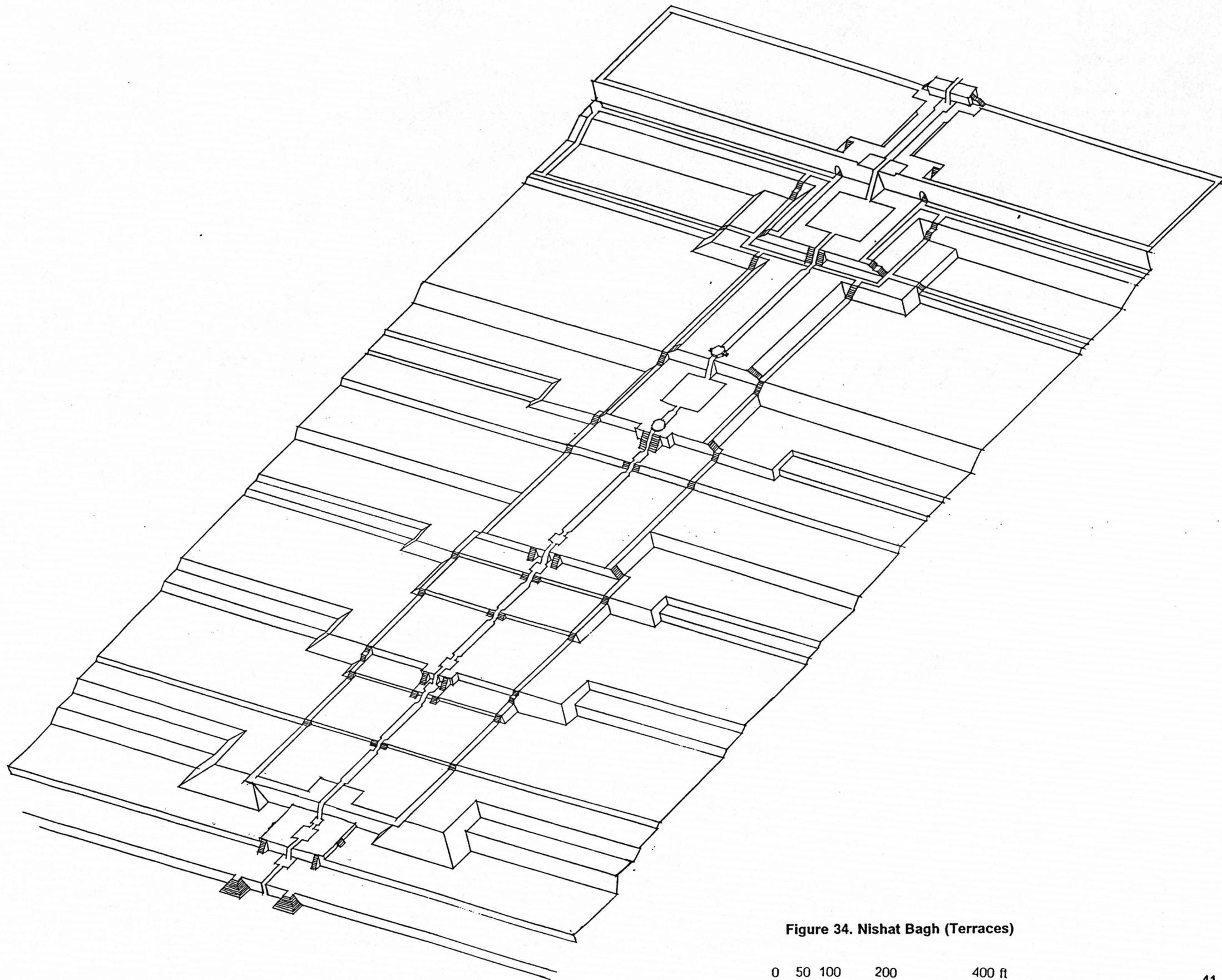
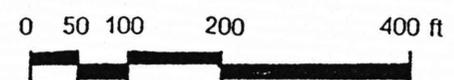


Figure 34. Nishat Bagh (Terraces)



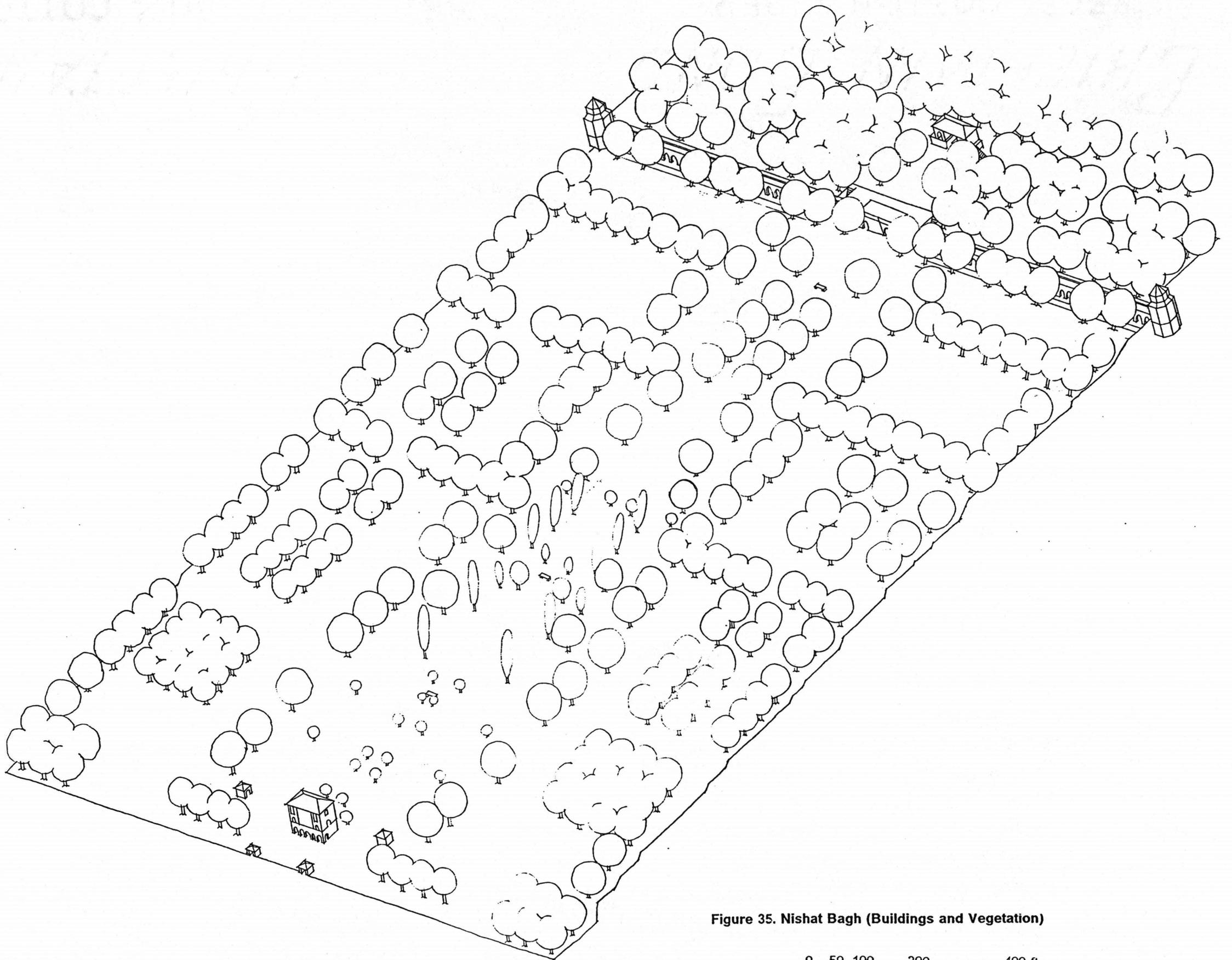
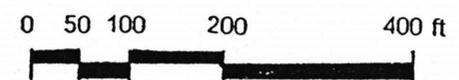


Figure 35. Nishat Bagh (Buildings and Vegetation)



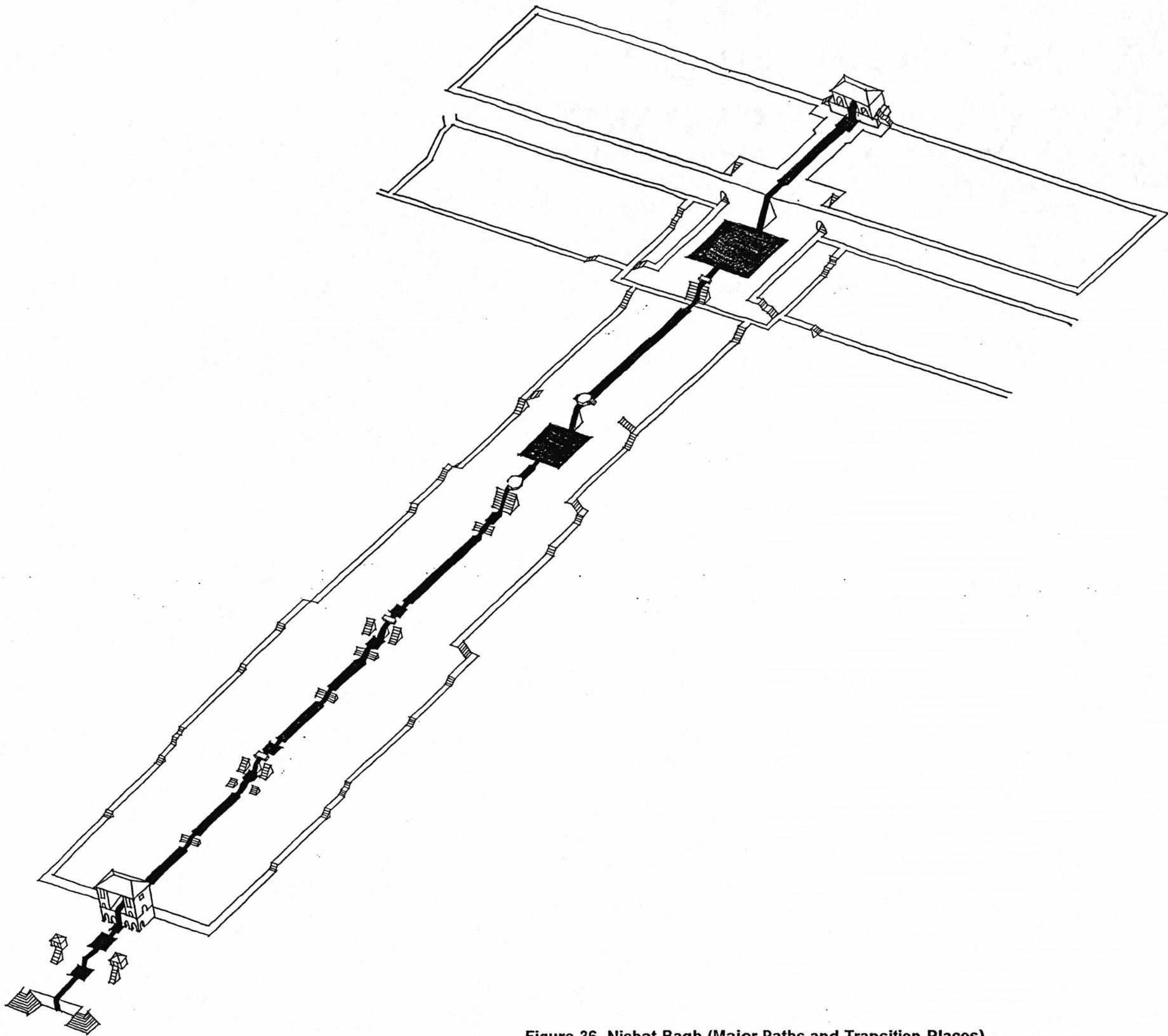
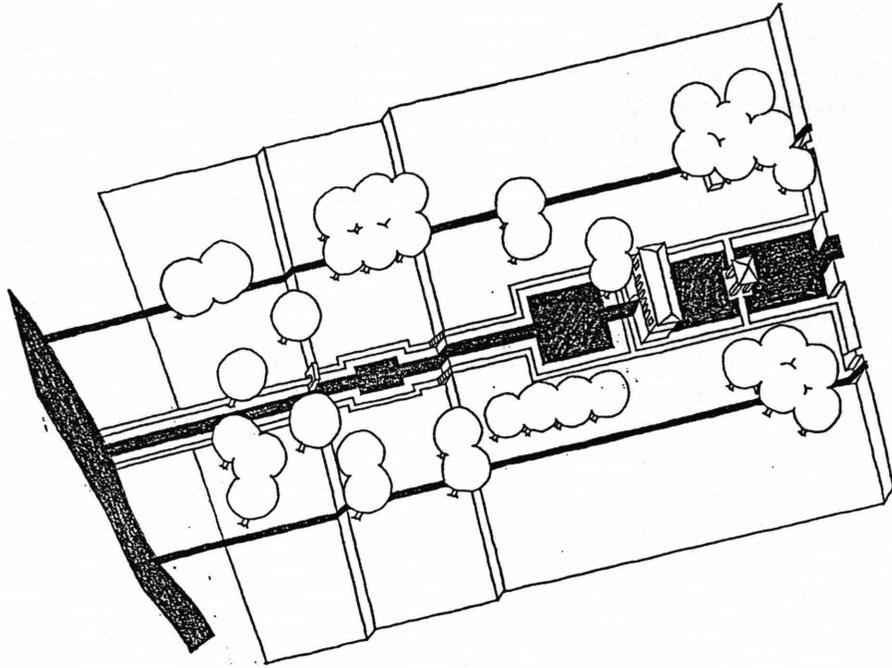


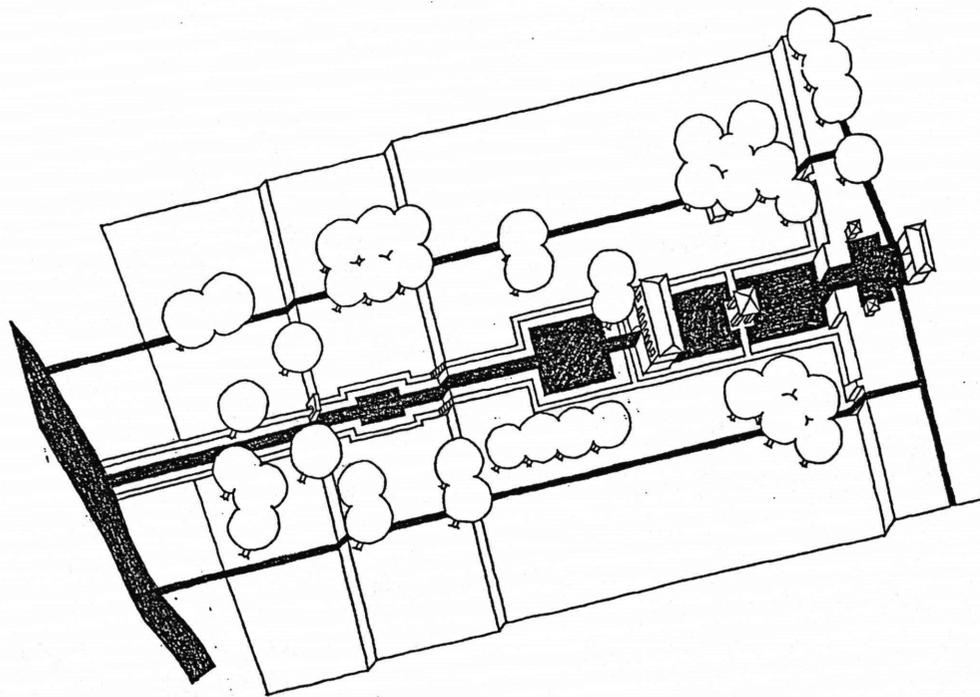
Figure 36. Nishat Bagh (Major Paths and Transition Places)



## Achabal



At Achabal, the gardens lie at the foot of a hill. There are two gardens ; the private garden and the zenana garden. The private garden is levelled into three terraces. It has three water courses which turn into cascades at each level change. The central water course, which flows through water pools and sometimes under a pavilion, maintains the axis of the garden. It is flanked by paths and flights of steps.



A large level change at the end of the wide pool separates the zenana garden from the private garden. A big waterfall at the center and two chadars at the sides use this level change. The waterfall is flanked by two small summer-houses. On this terrace is a pool and a pavilion which houses natural springs. The whole garden is watered by these springs. Here, long views open to the countryside and the mountains beyond.

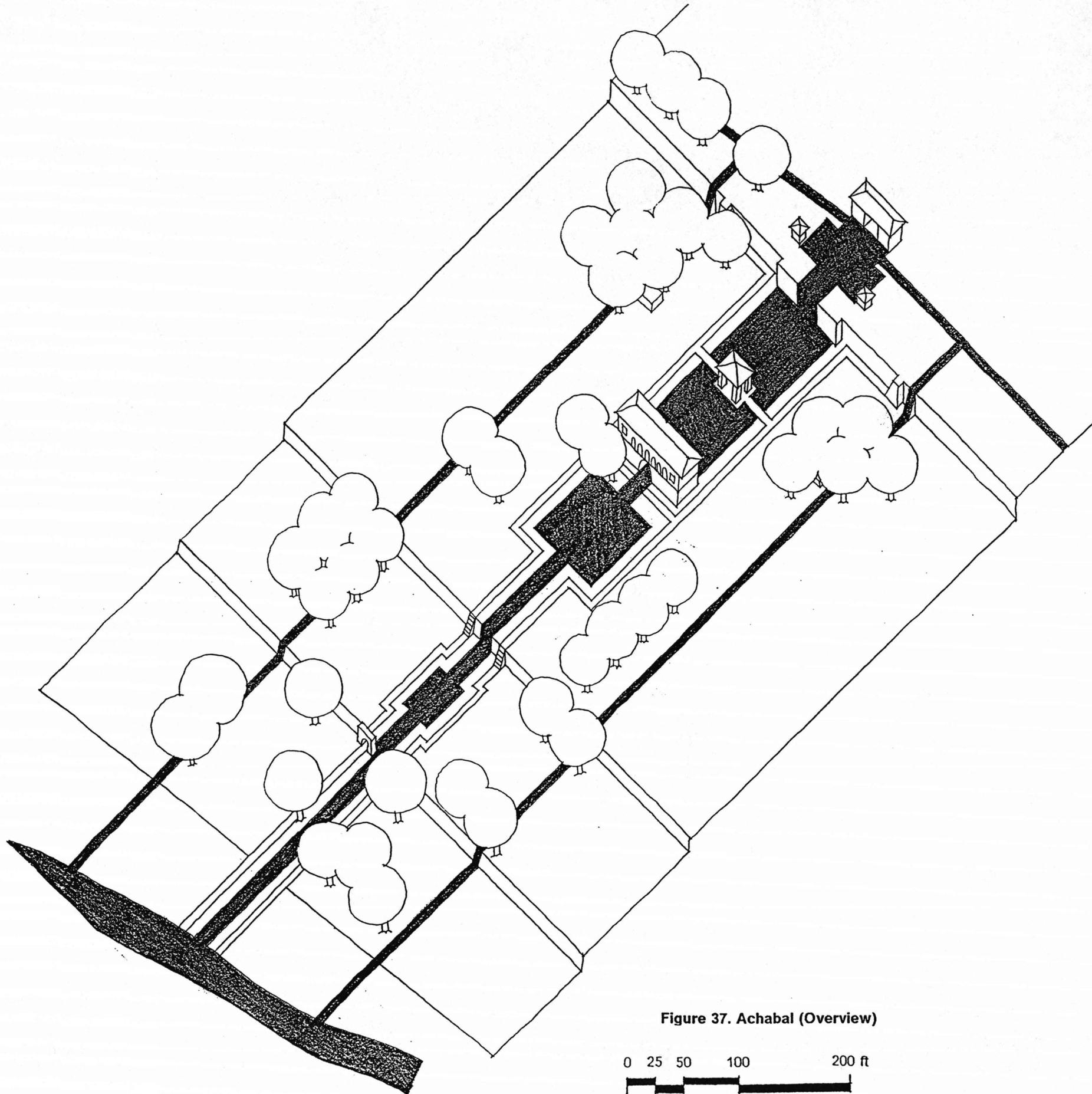
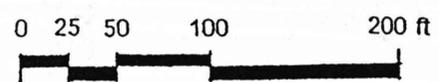


Figure 37. Achabal (Overview)



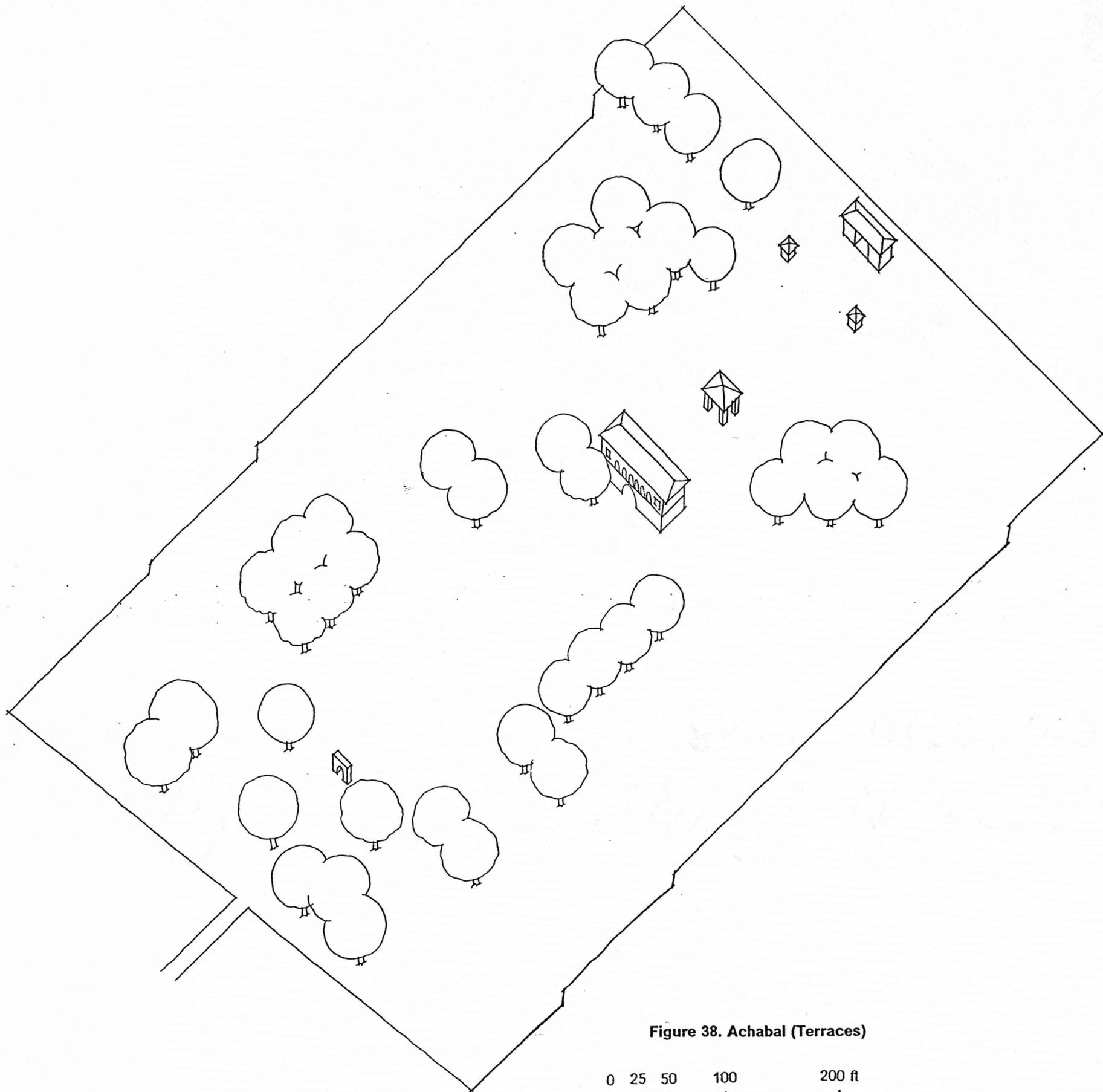
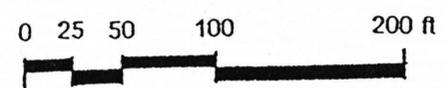


Figure 38. Achabal (Terraces)



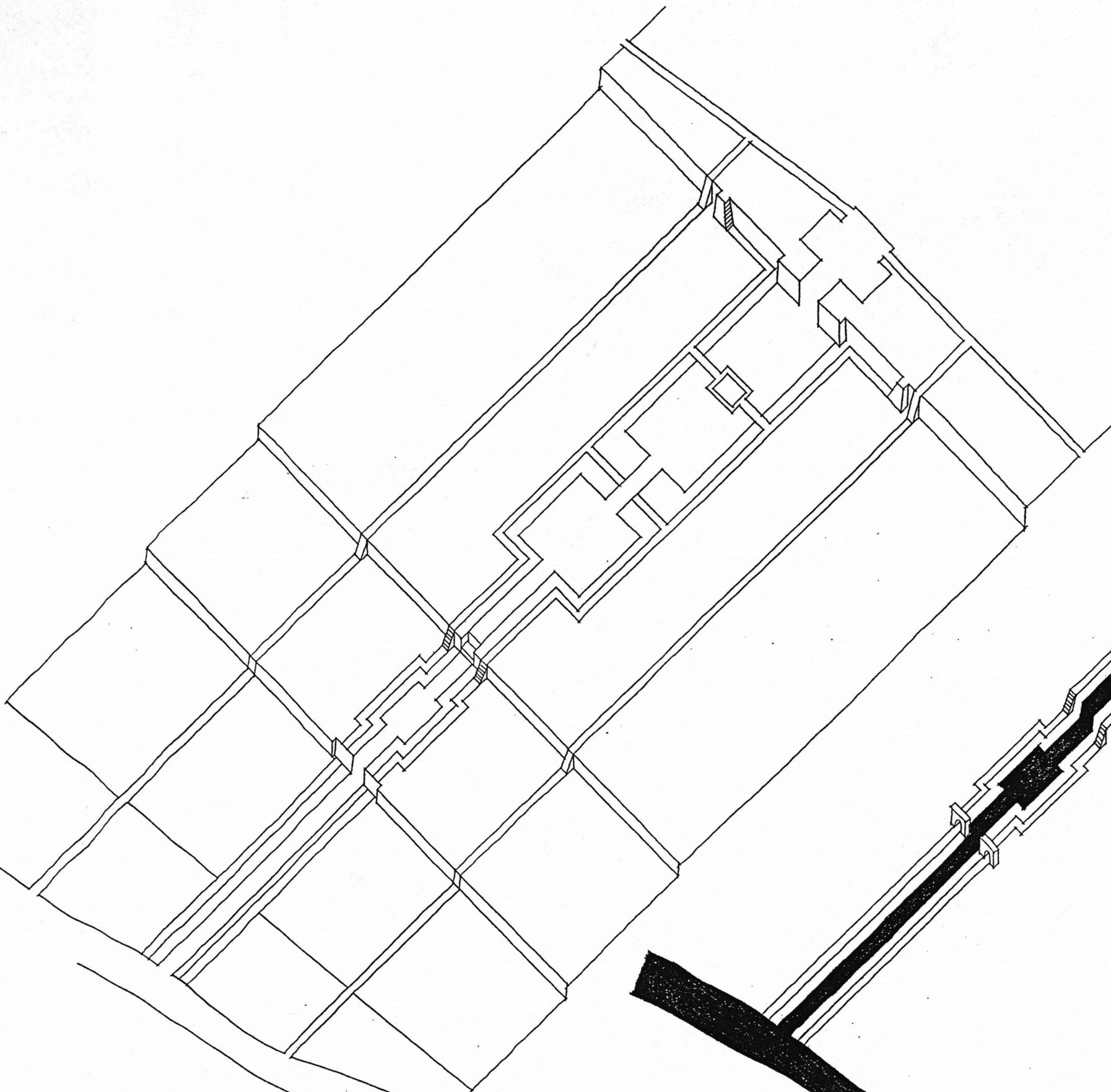


Figure 39. Achabal (Buildings and Vegetation)

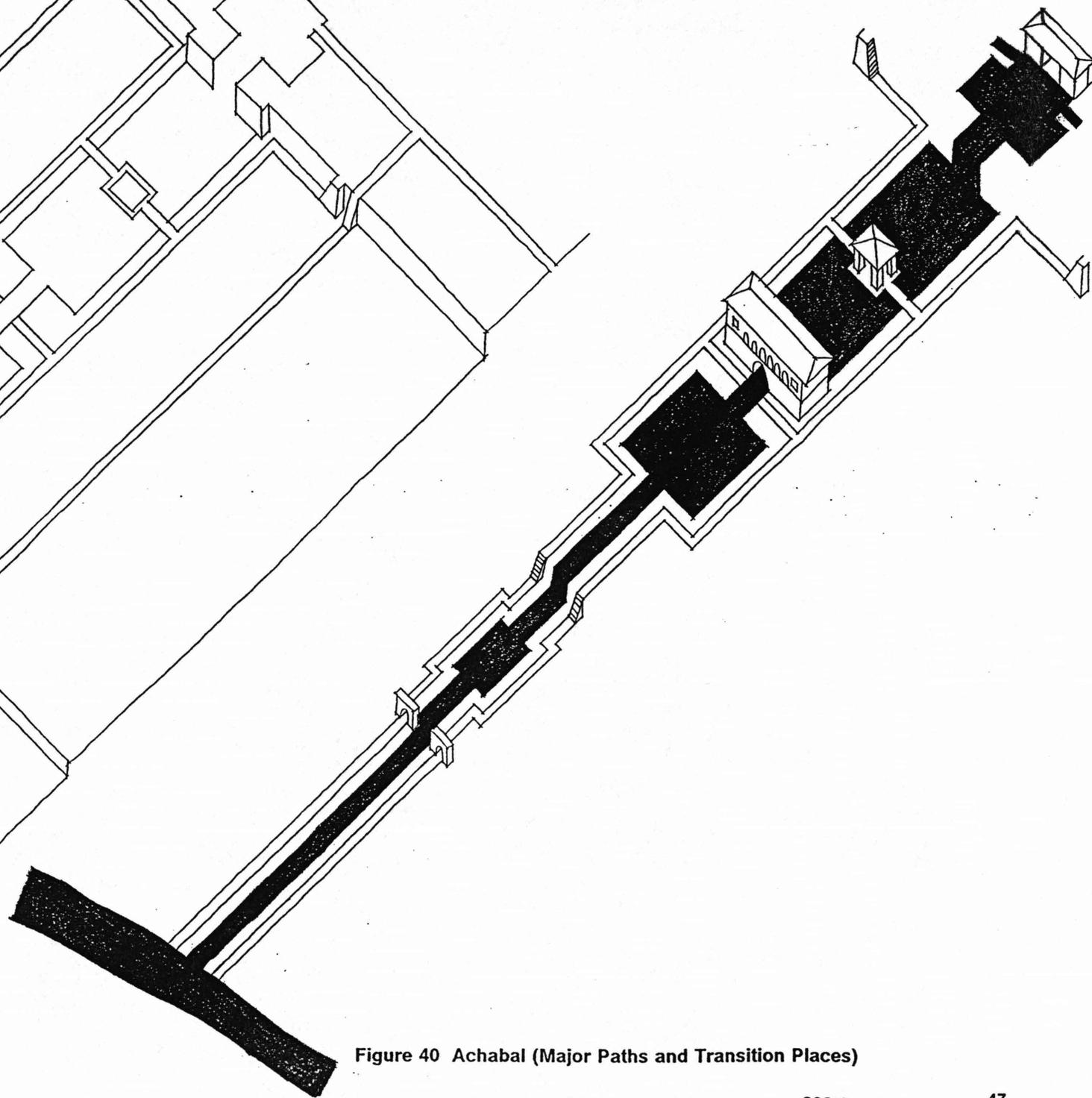
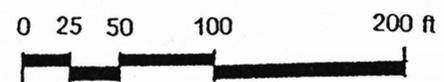
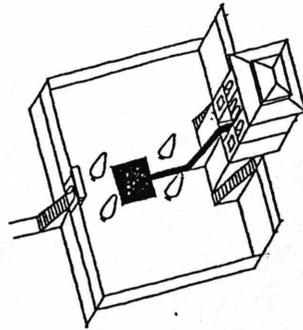


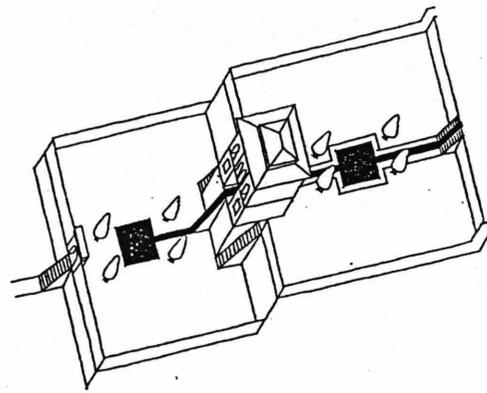
Figure 40 Achabal (Major Paths and Transition Places)



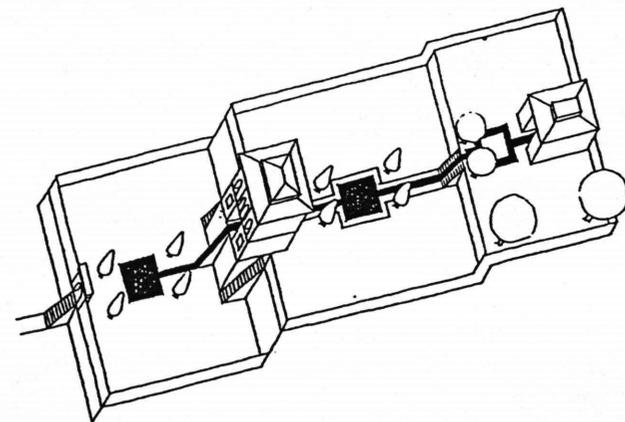
## Chasma Shahi



Chasma Shahi is located at the foot of a mountain and is levelled into three terraces. The approach is by way of a steep flight of steps, culminating in an arch, which is the entrance to the lowest water garden. On the lower terrace is a rectangular water basin and a canal. It is fed from a water chute in the center of a retaining wall approximately 20 feet high. A two-story pavilion is sited in the middle of the level change, and side-steps lead to the next space.



On the upper terrace, again there is a wide rectangular tank, with a single jet and a canal. The forward outlook is cloistered and intimate. By contrast, a backward glance provides a spectacular view of the Lake Dal and the mountains.



From here, a slight change in level leads to the highest terrace. The water starts from a powerful spring on this terrace set in the floor of the upper pavilion.

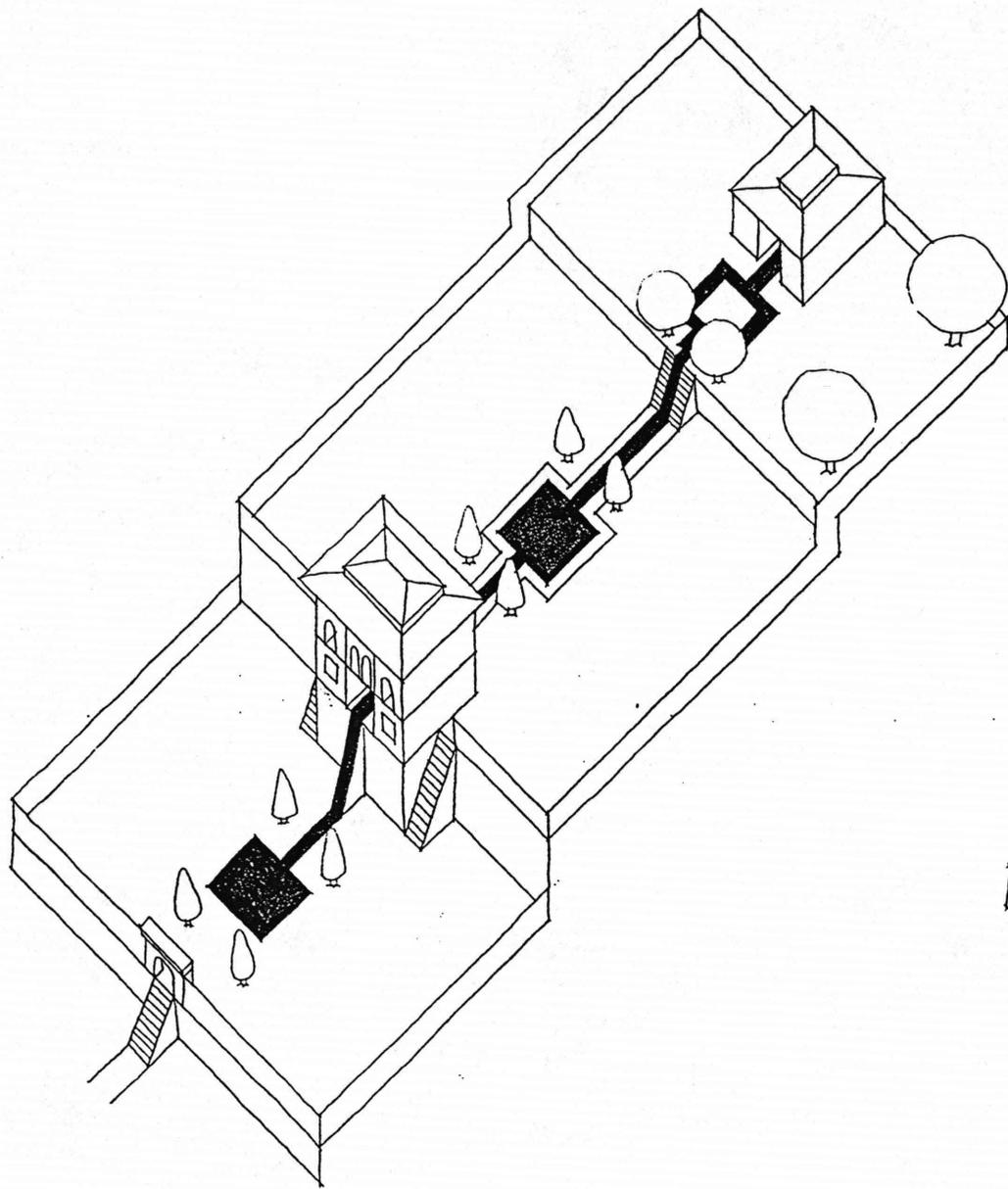


Figure 41. Chasma Shahi (Overview)

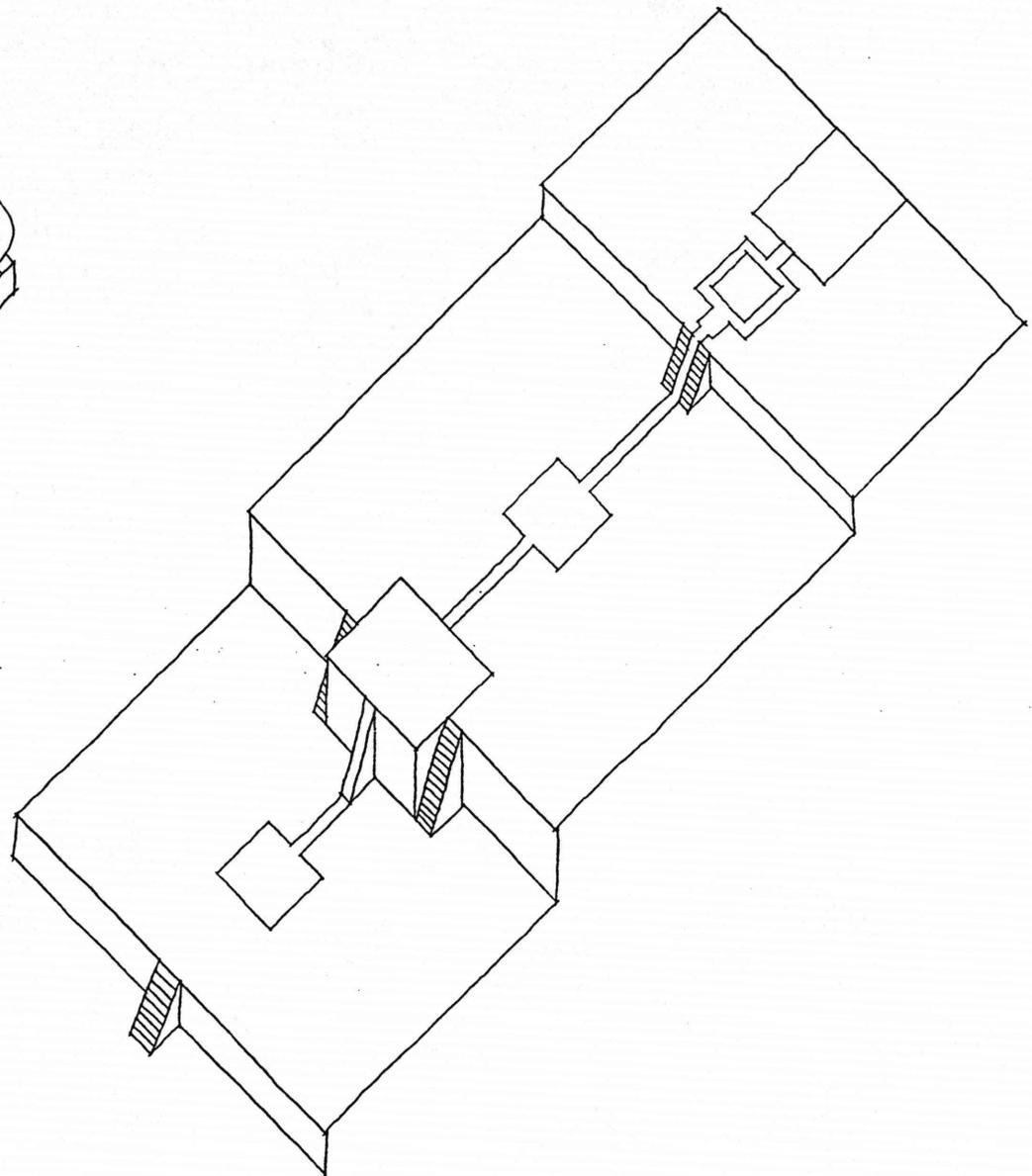
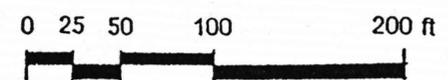


Figure 42. Chasma Shahi (Terraces)



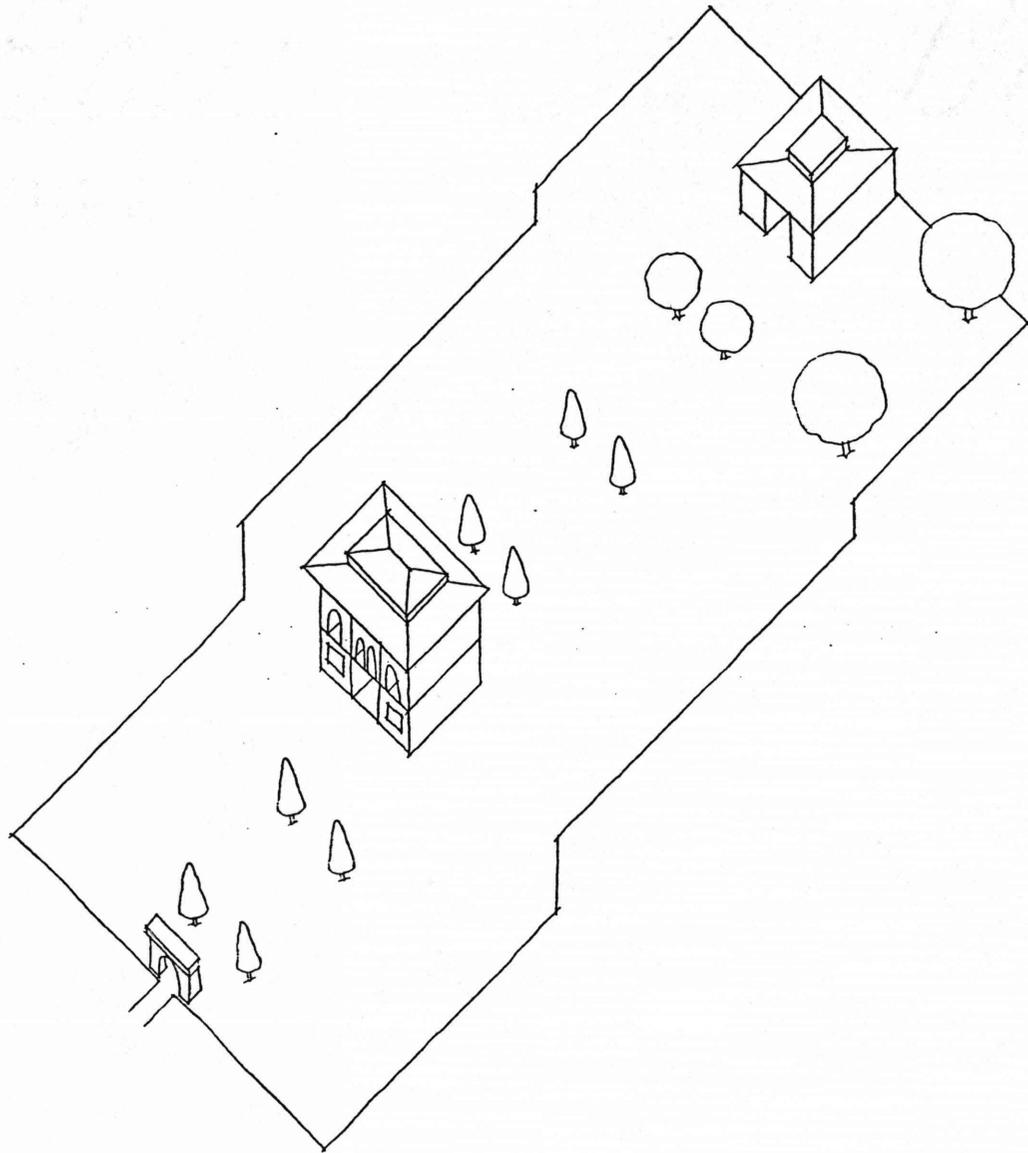


Figure 43. Chasma Shahi (Buildings and Vegetation)

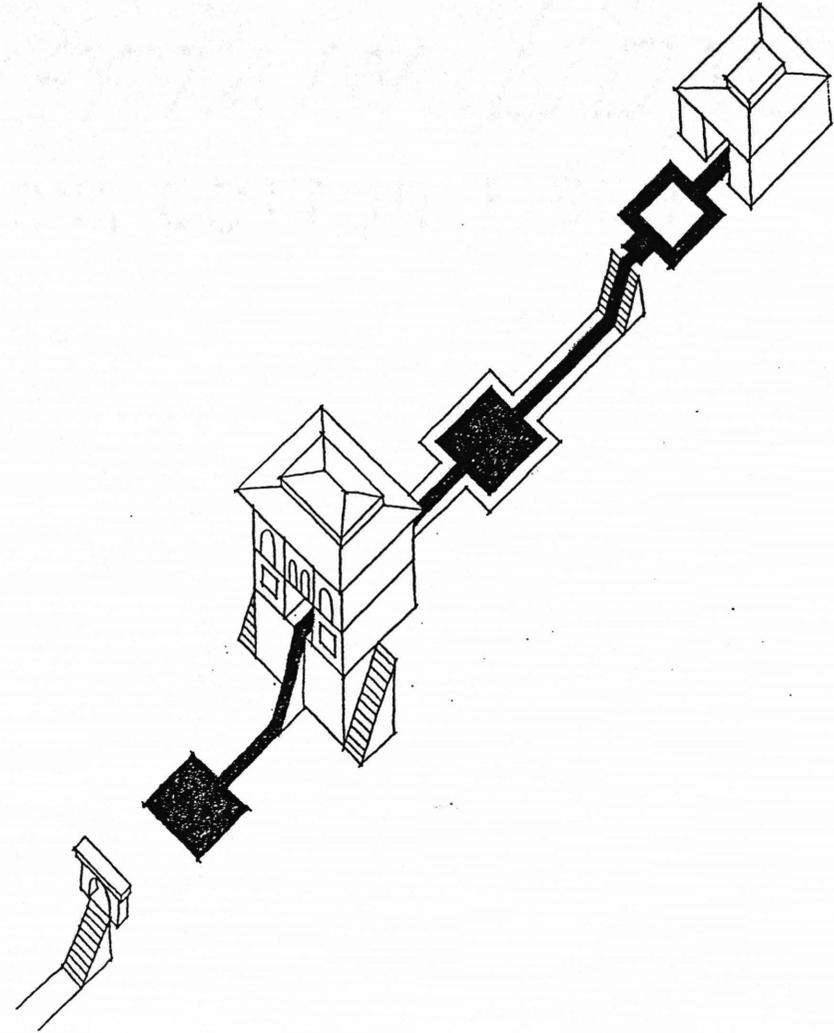
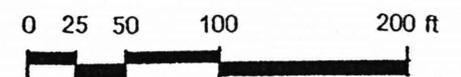
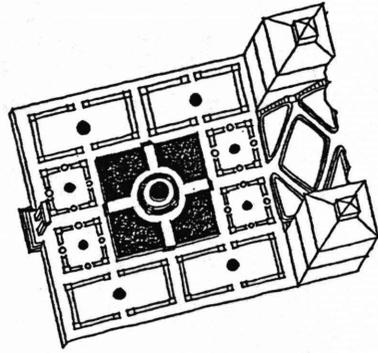


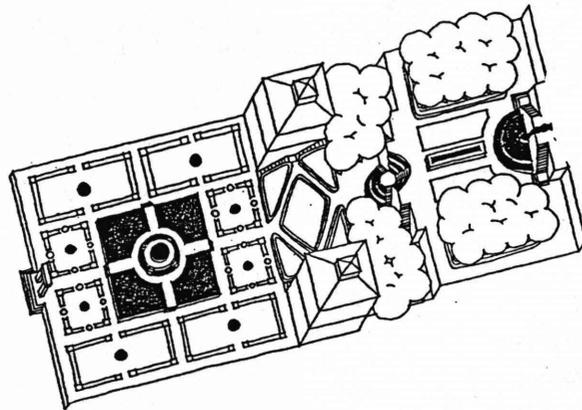
Figure 44. Chasma Shahi (Major Paths and Transition Places)



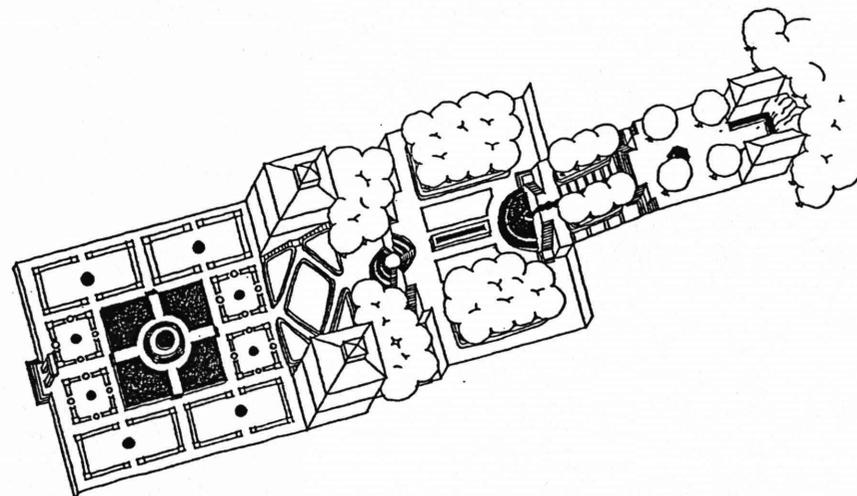
## Villa Lante, Bagnaia



Villa Lante is sited on a steep hillside. The whole is enclosed by walls and situated within a larger wooded park. The entrance is on the lowest level. The lowest garden has the most formal landscaping. It has parterres and a large, square pool in the center. It is the most open and the largest space in the whole garden. From this terrace, a sloping plane of grass ascends between the twin casini to the second level of the ground. The slope has diagonal hedges in the middle and two flights of steps at the sides.



The second terrace has, as its major element, a circular water feature. Built in a series of concentric circles that rise to the next level, the fountain visually connects the upper and lower terraces. The steps, cut into the fountain from each side, lead to the upper terrace. On the third terrace is located a piece of stone furniture at the center and shady grass areas at the sides. At the end of this terrace is another circular fountain. The side stairs, combined with the fountain, lead to the next space.



The space is enclosed by hedges and trees. In the center is a long sloping cascade called the Water Chain. At both sides, between cascade and hedges, are ramped steps. At the very top of the cascade, a final few steps lead to the villa's fourth terrace. This is the most enclosed, shaded natural space in the villa. In the center is an octagonal fountain, and in the rear corners of the shady space behind the fountain are two open-fronted pavilions. Between the two shelters is a fountain which resembles a grotto and woodland cliff.

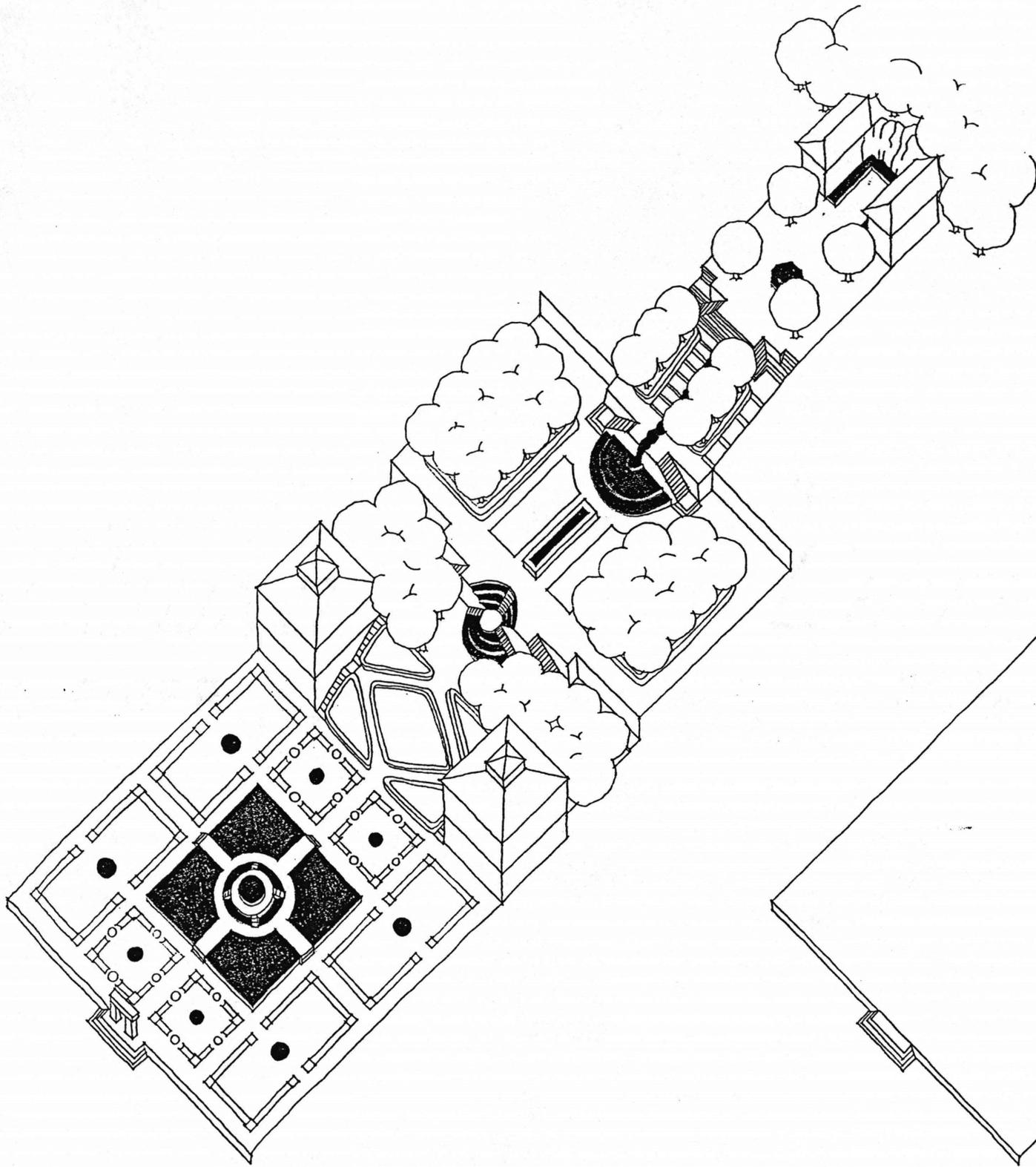


Figure 45. Villa Lante (Overview)

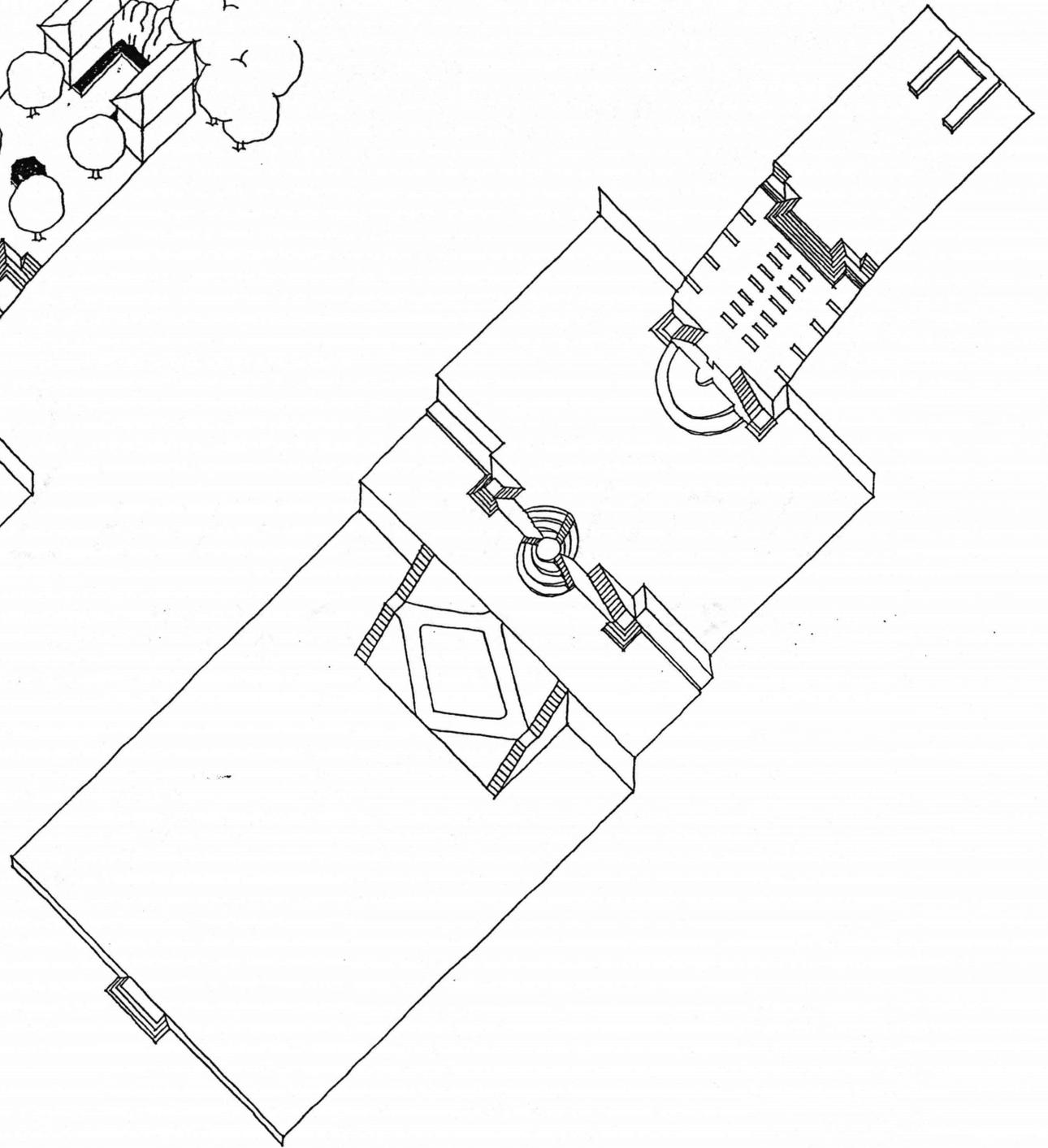


Figure 46. Villa Lante (Terraces)

0 25 50 100 200 ft

A scale bar with markings at 0, 25, 50, 100, and 200 feet. The bar is a thick black line with vertical tick marks at each interval.

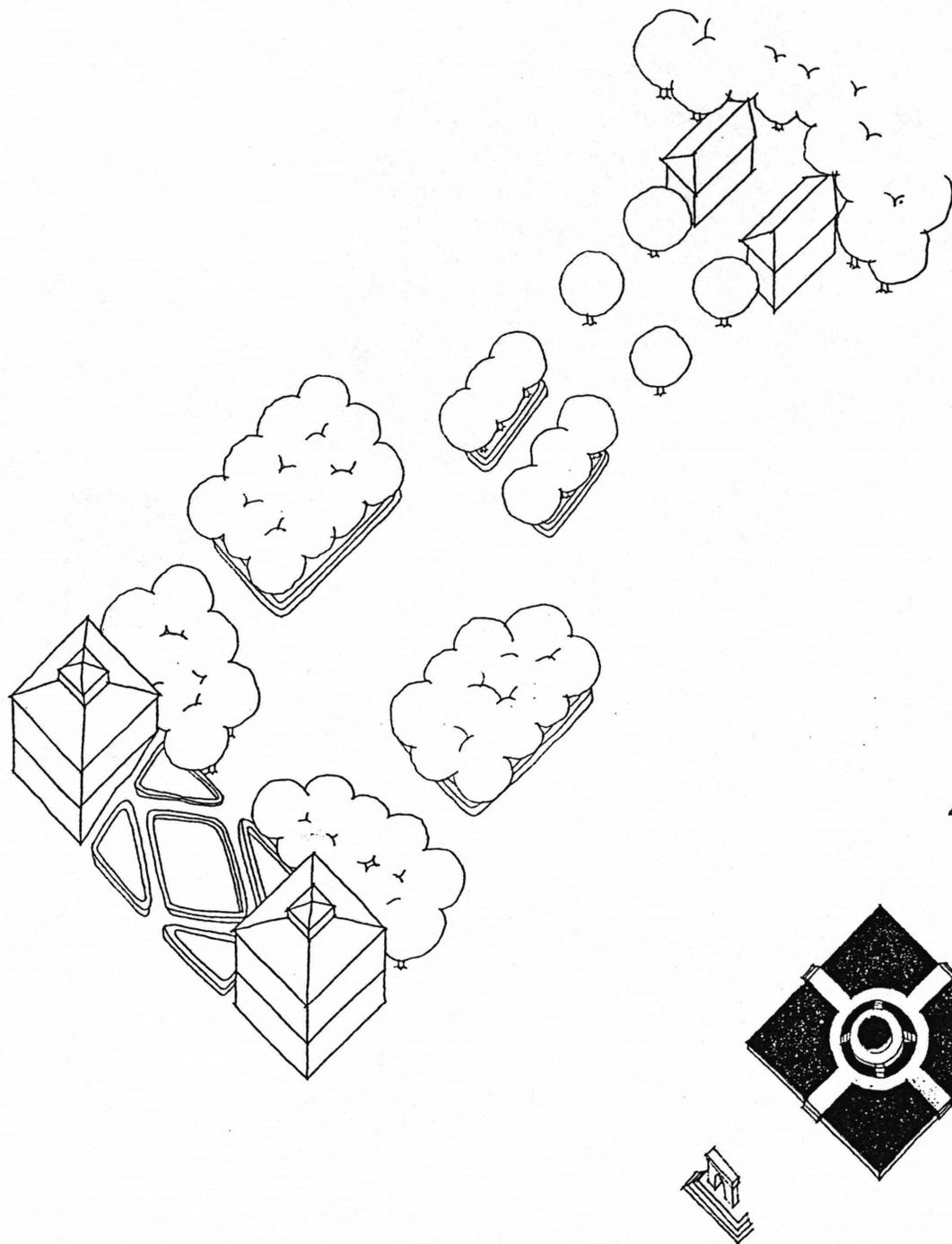


Figure 47. Villa Lante (Buildings and Vegetation)

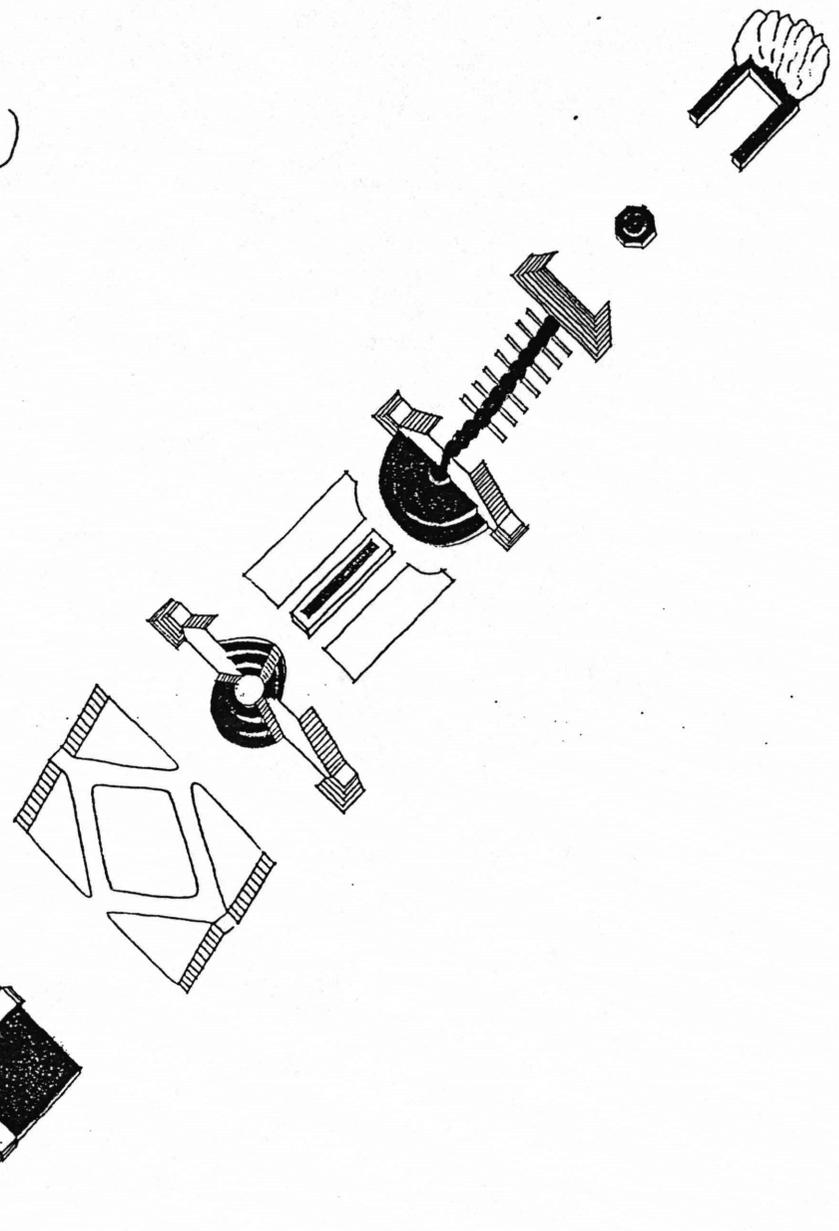
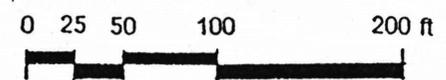
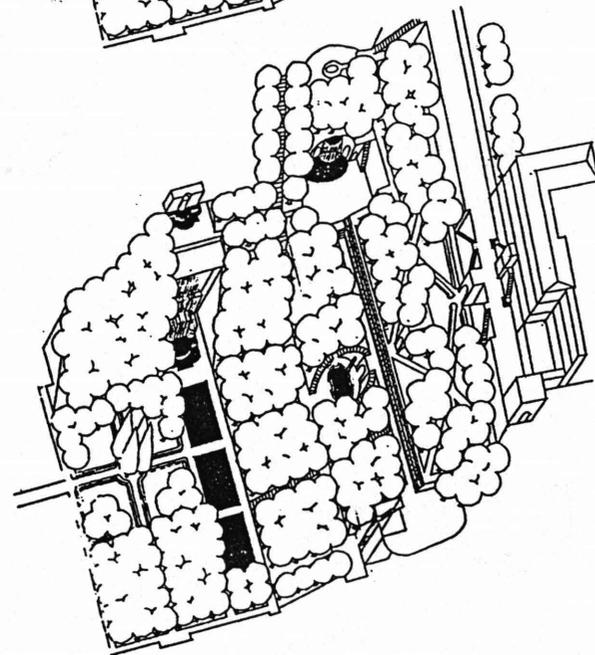
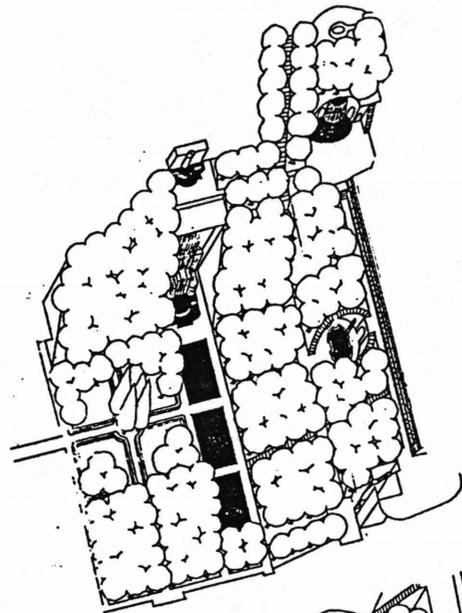
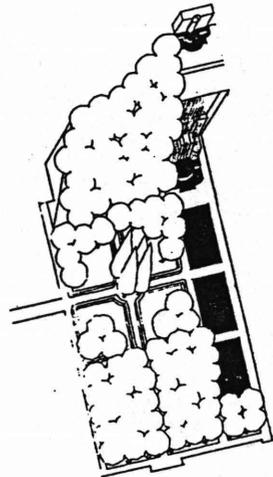


Figure 48. Villa Lante (Major Paths and Transition Places)



## Villa d'Este, Tivoli

Villa d'Este is sited on two steep—southeast and northeast—slopes. The garden is strongly axial—one main axis, two minor and several cross-axes. The approach is from the lowest level. The lower garden is a flat and grassy terrace, partially covered with trees at both ends. Beyond this, the pools and the water organ on the northeast slope form the first main cross-axis.



From here, the steep incline ascends to the terrace. Three sets of stairs are laid on the wooded slope; one set of stairs continues the main axis and the other two, the secondary paths. These stairs have stepped balustrades, which have a continuous stream of bubbling water. Ascending the slope, the central stairs are diverted into two oval flights around the Fountain of the Dragon. The stairs reach to the second largest cross-axis, Lane of the Hundred Fountains, in the middle, and two large fountains at the ends. This place is full of water movement and sound.

On the slope above the Lane, diagonal paths lead upward through thick woods. At the ends and intersections of these paths are small grottoes built into the slope. Running along the top of this wooded slope is a crosswalk, called the Cardinal's Walk. On the main axis over the Cardinal's Walk is a loggia, called the Fountain of Pandora. Two pairs of stairs on its sides lead to the highest terrace. On this terrace is the villa and the Secret Garden. Here is a spectacular vista of the whole garden.

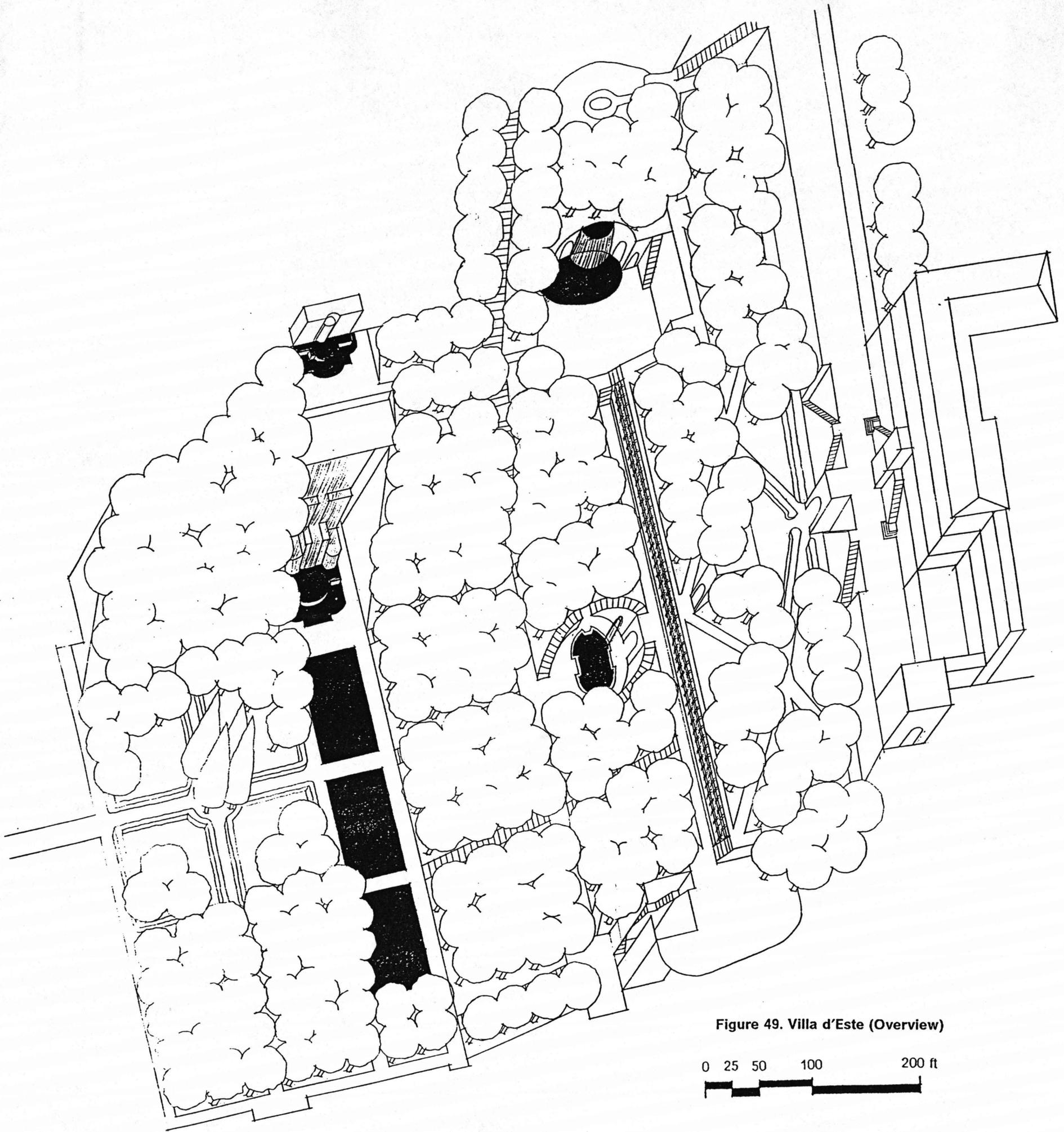
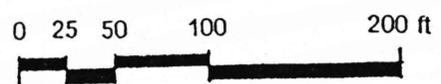


Figure 49. Villa d'Este (Overview)



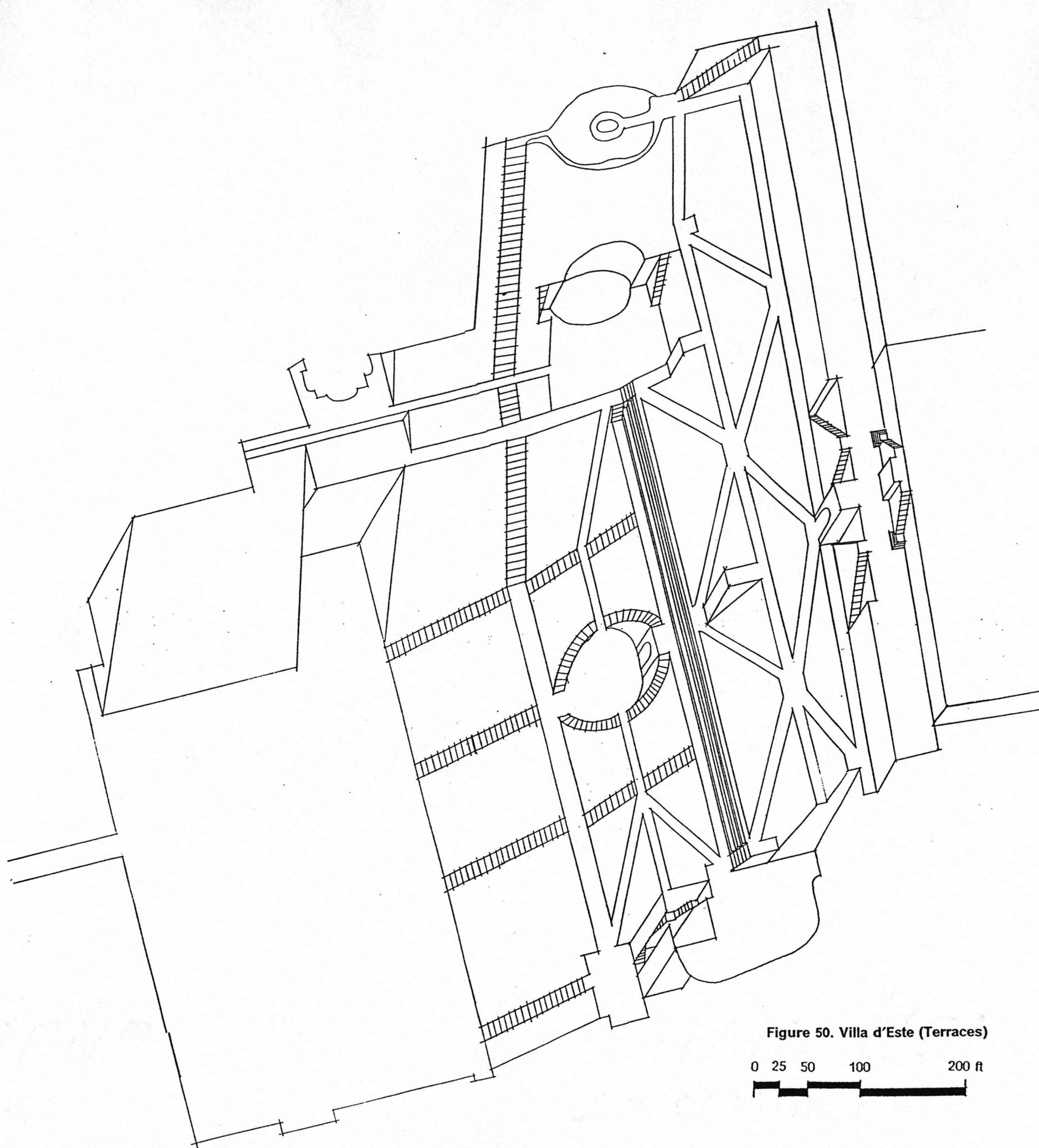
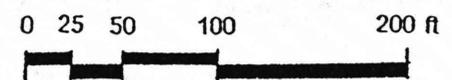


Figure 50. Villa d'Este (Terraces)



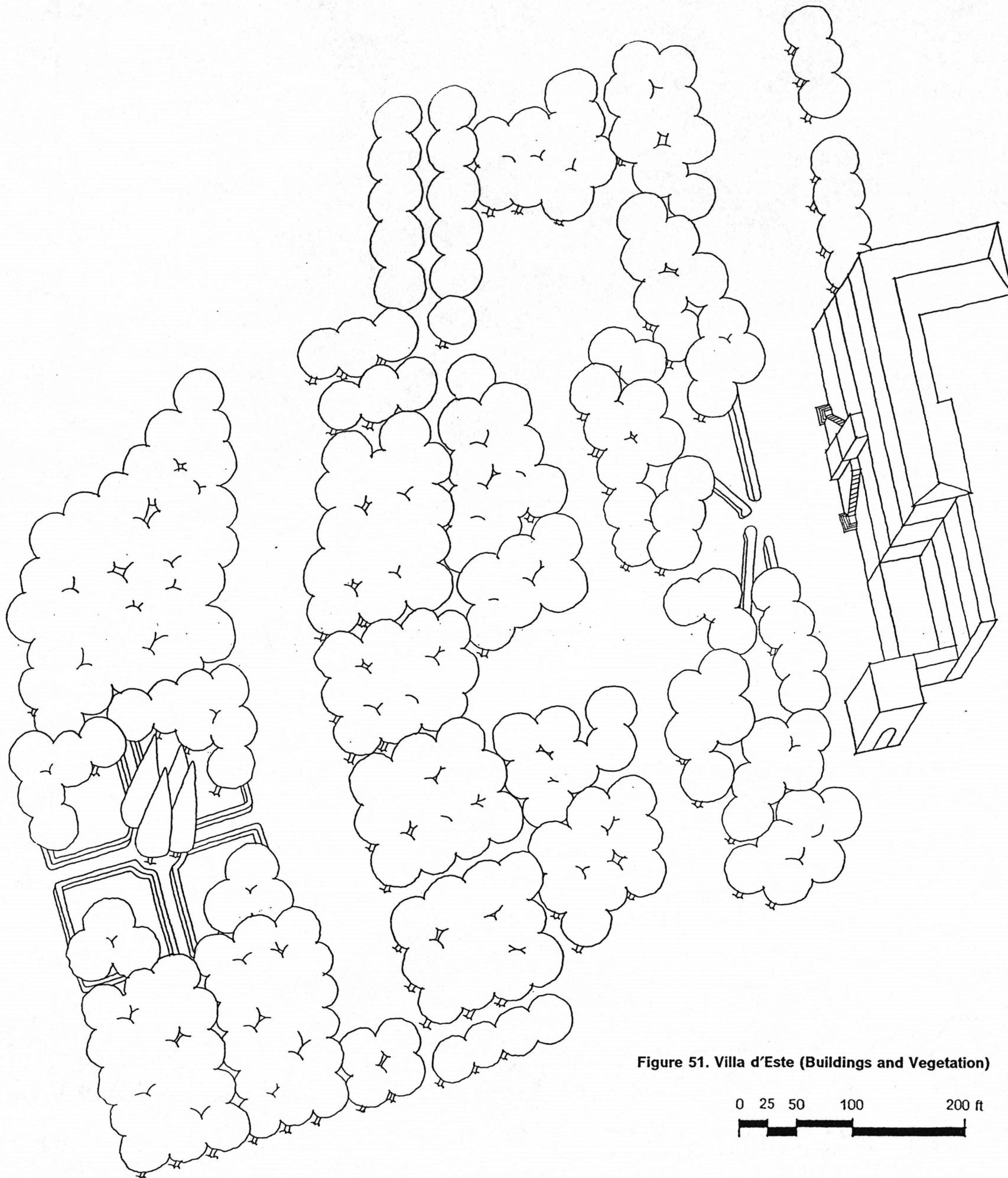
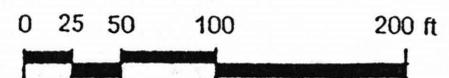


Figure 51. Villa d'Este (Buildings and Vegetation)



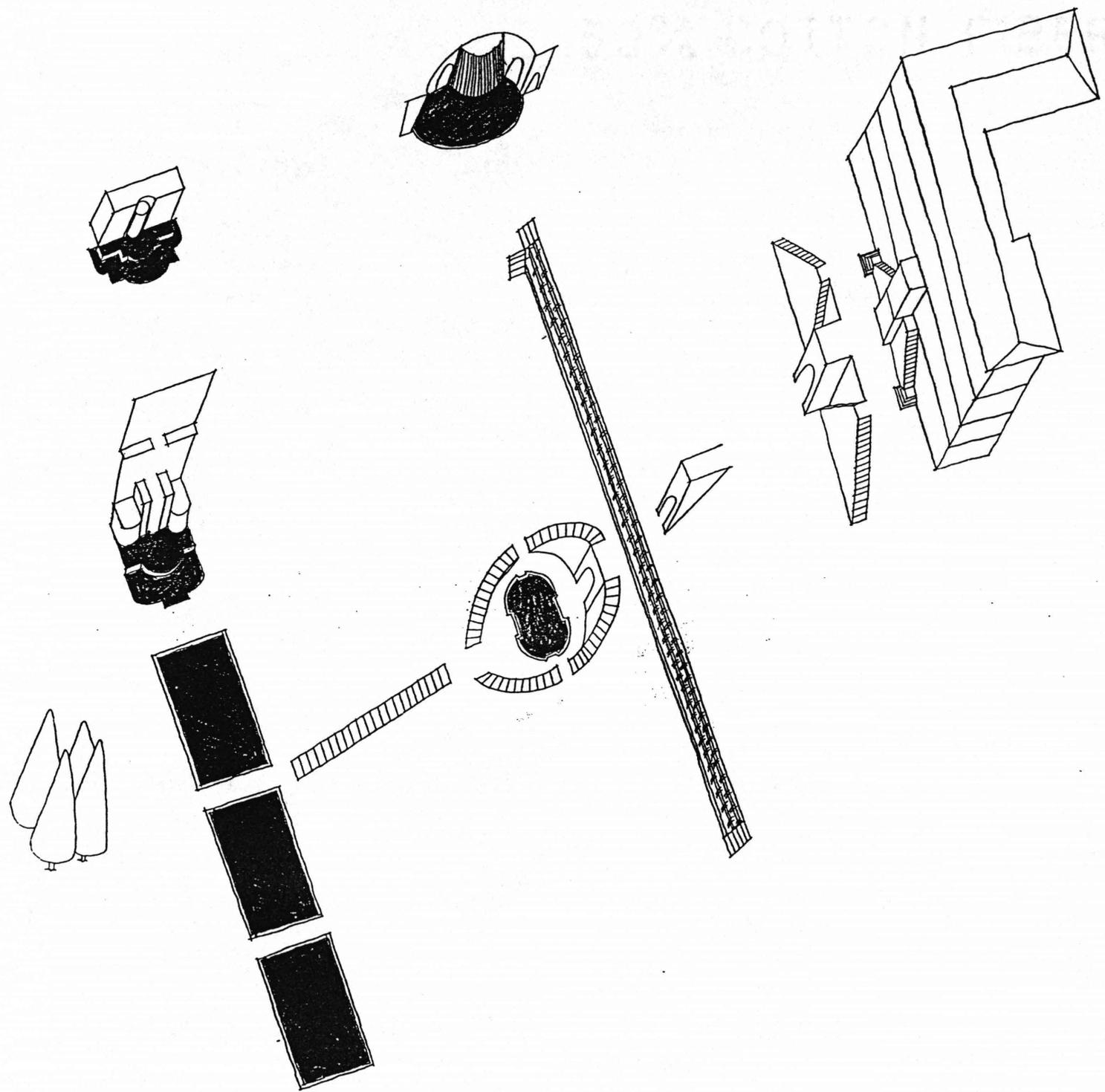
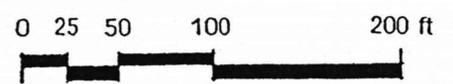
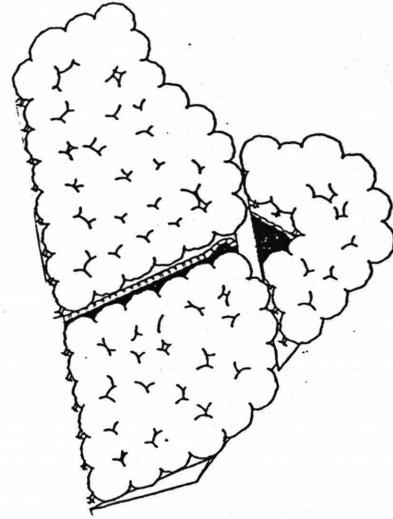


Figure 52. Villa d'Este (Major Paths and Transition Places)

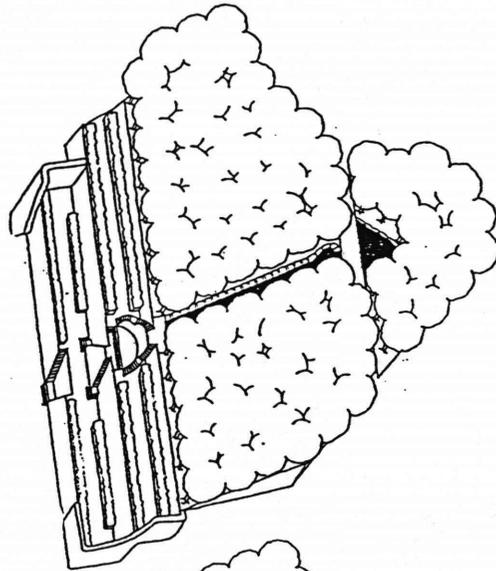


## Villa Garzoni, Collodi

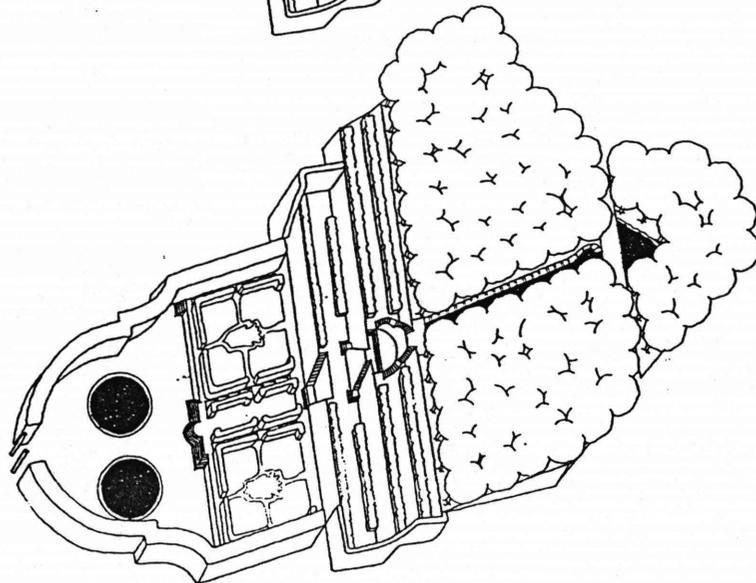
Villa Garzoni is sited on a steep hillside. The house is separated from the garden, sitting high up on one side of it. The way from the house purposely leads through the dark over-hanging bosco to the top of the cascade. Here, the great vista appears. There is a water cascade in the center between the wooded slopes. Ramped steps at the sides lead downwards.



The central complex of stairs connects three narrow terraces. It leads slowly to the foot of the garden.



On the bottom terrace is a broad and enclosed arena of parterres and fountains. It has fine and formal landscaping. Thick hedges shape the boundary of the garden.



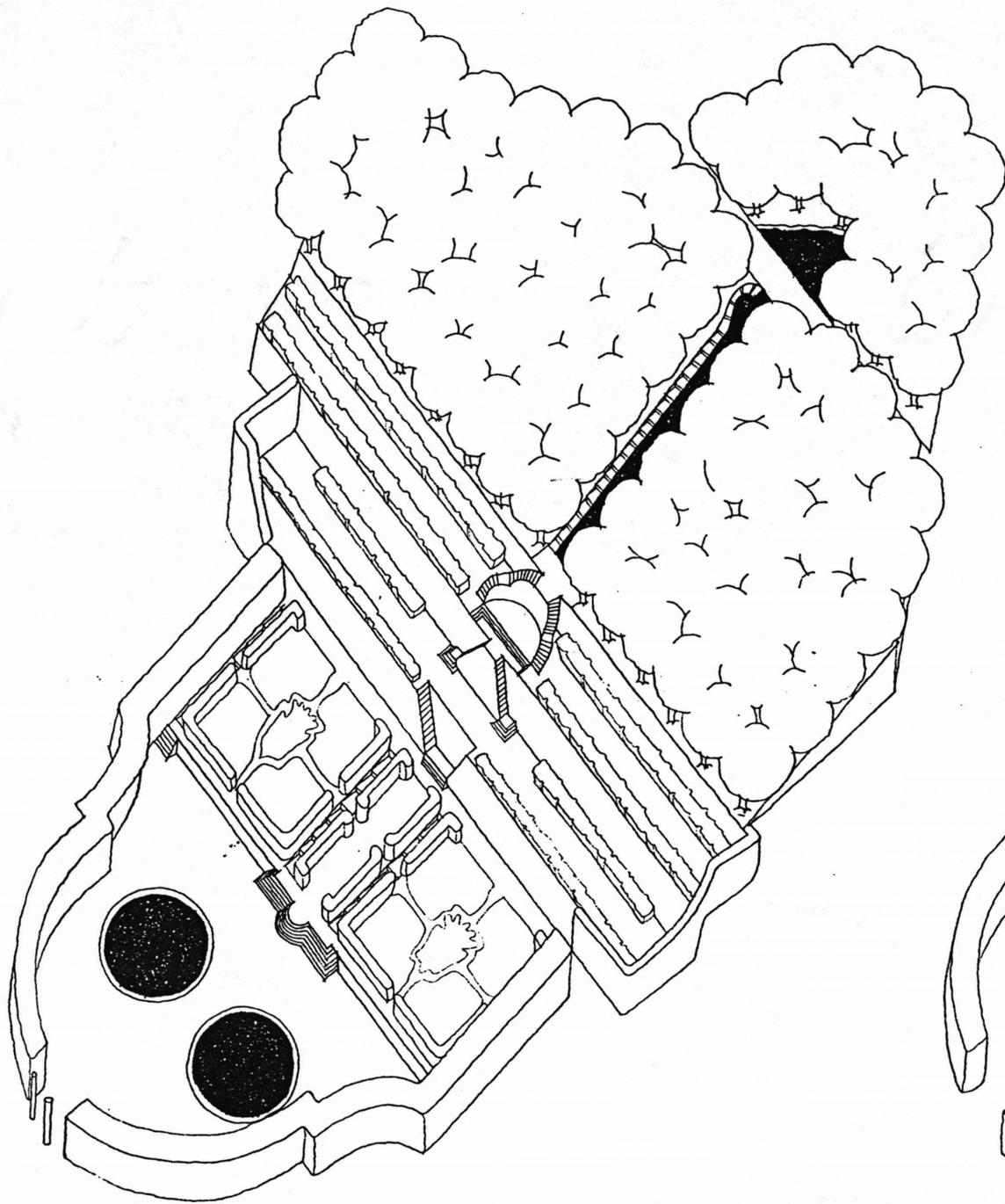


Figure 53. Villa Garzoni (Overview)

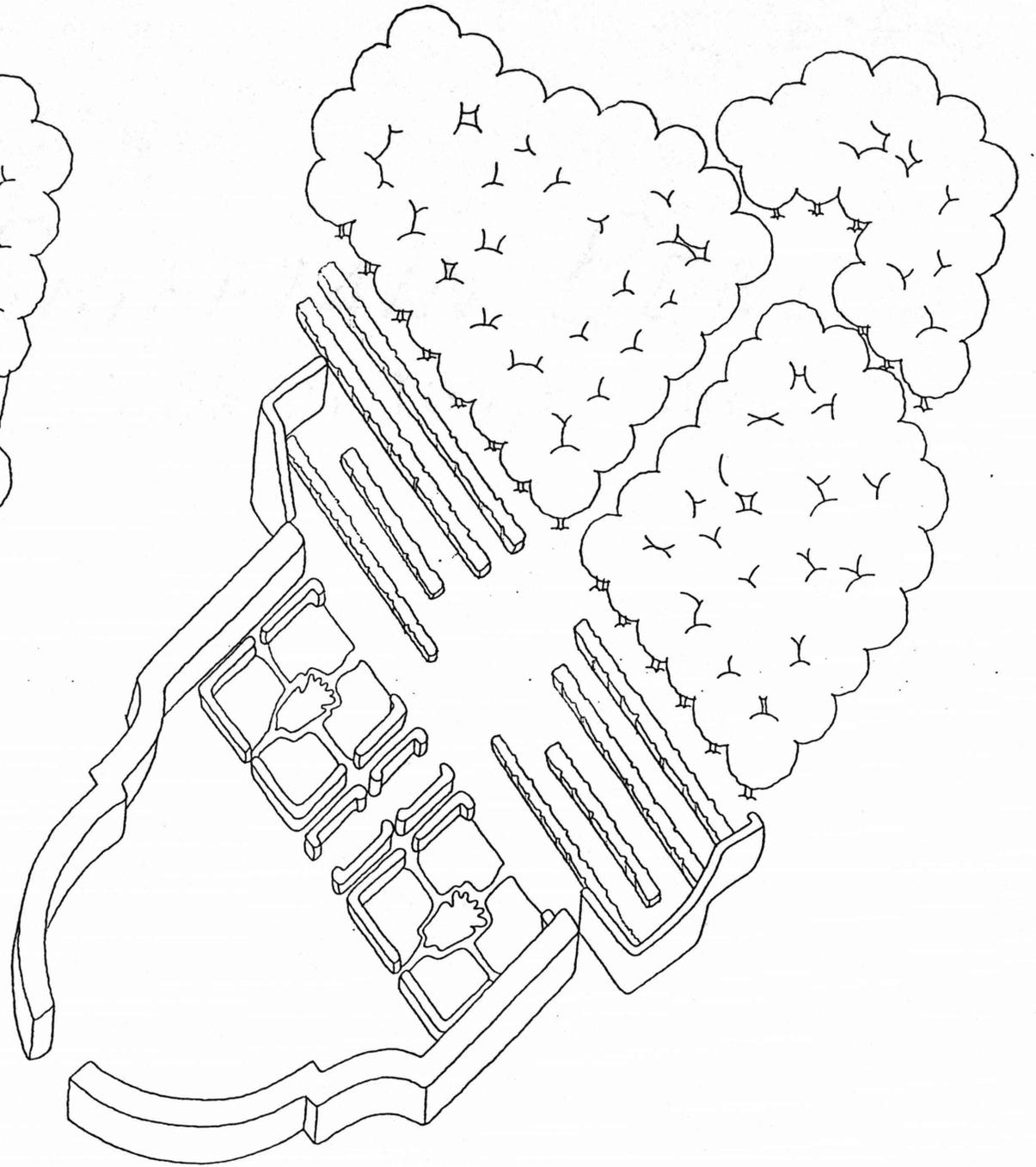
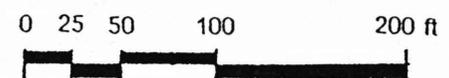


Figure 54. Villa Garzoni (Terraces)



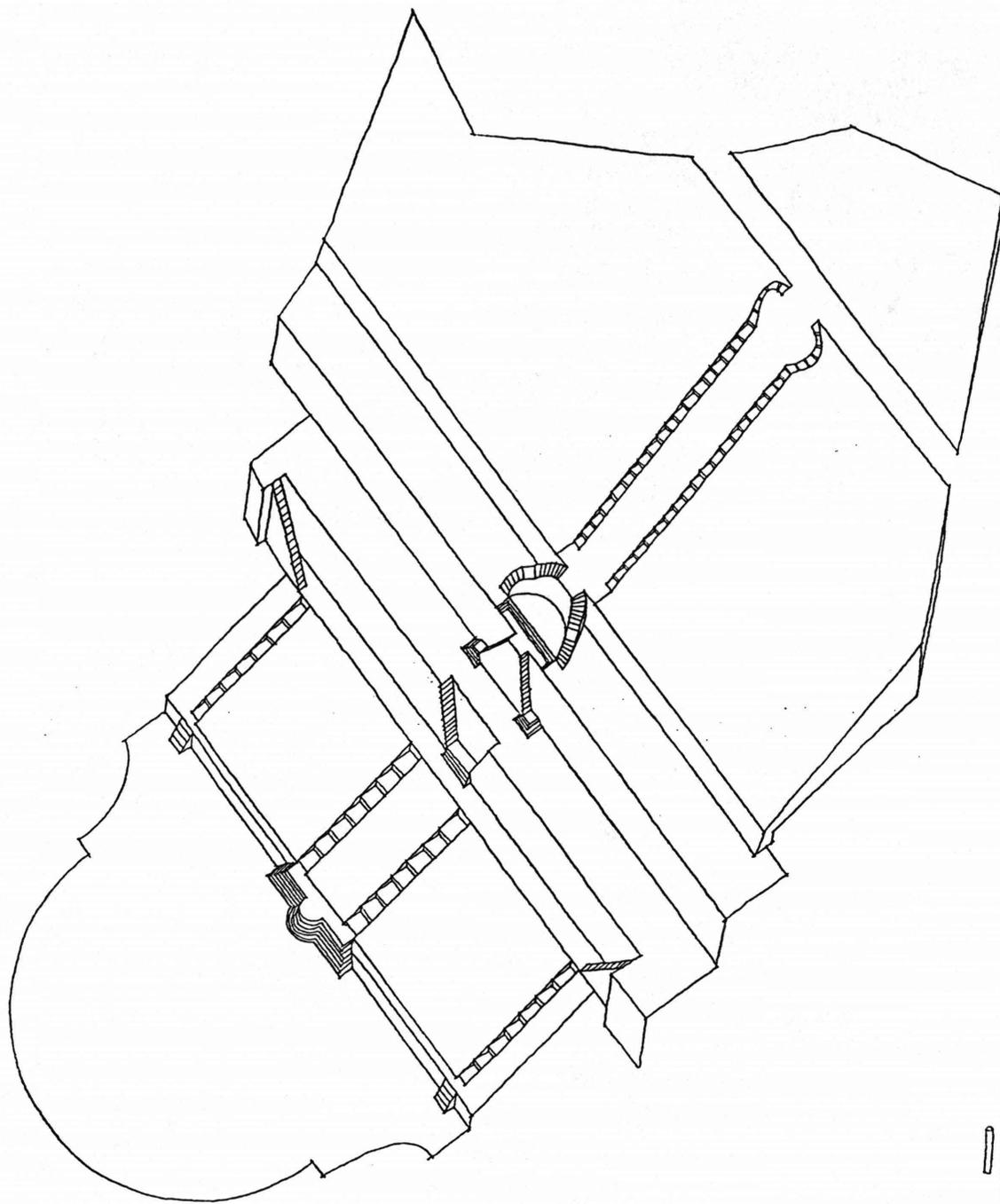


Figure 55. Villa Garzoni (Buildings and Vegetation)

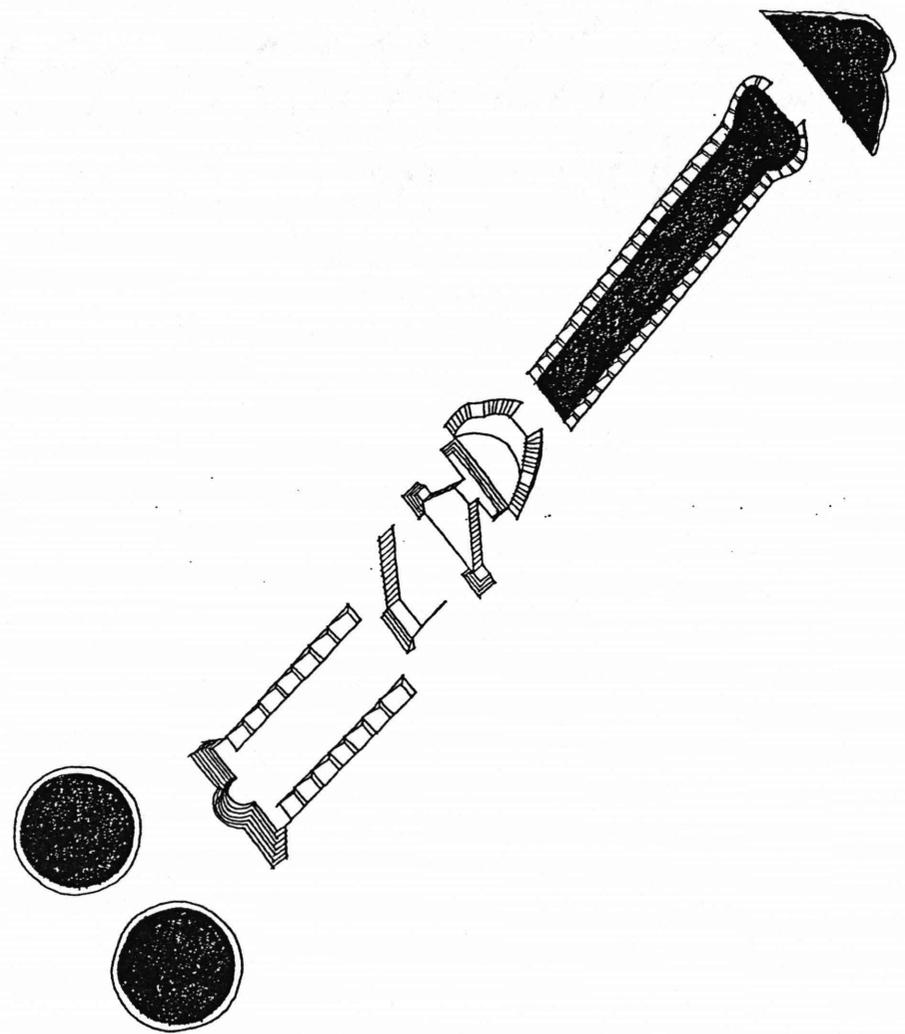
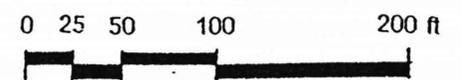
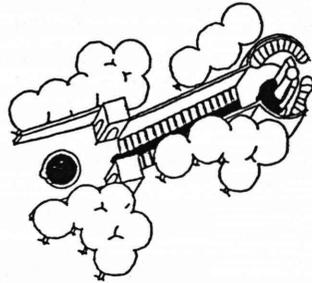


Figure 56. Villa Garzoni (Major Paths and Transition Places)

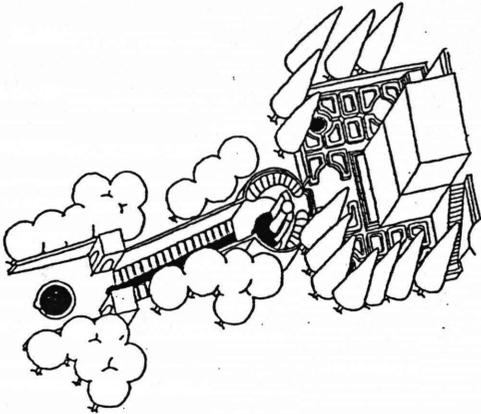


## Villa Farnese, Caprarola

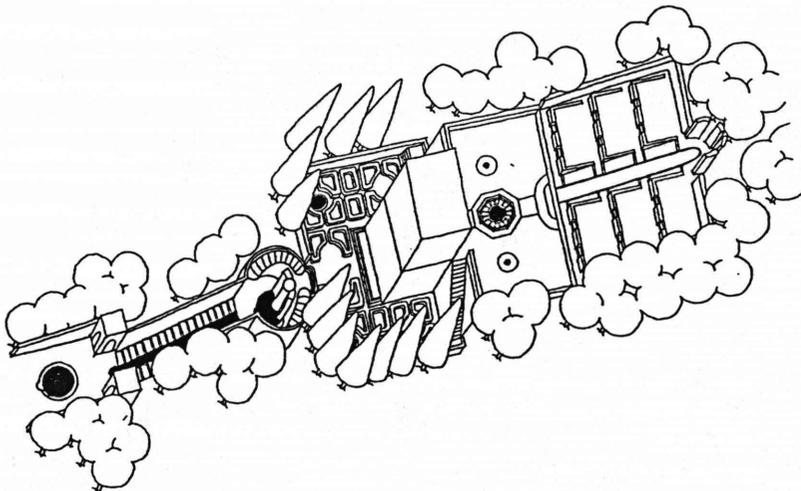
The Villa Farnese is located on a steep hillside. It is approached through a wooded path climbing gently up the hill. This villa starts with a square entrance which has a circular basin in the center. At the inner corners of the square are twin pavilions. Between the pavilions is a steep slope having a chain cascade on its center-line. At both sides are ramped steps, bounded by paneled stone walls. Although the water of the cascade descends, the path on either side mounts towards the casino. The ramped steps lead to a circular terrace. Here a water basin at the center and curving stairs at the sides compose an architectural feature. A pair of curving stairs lead to the next level.



This terrace is a rectangular box garden delineated by walls with built-in seats. It is an open and highly articulated space. There is a two-story casino on the axis. A pair of stairs against the back retaining wall lead to the next terrace.



This terrace is quite simple. The casino is one-story high, and the garden is in two nearly equal parts. The first, touching the casino, is a flat, grassy rectangle with a central fountain and two smaller basins at the sides. Higher up is a tilted area, divided into three successive terraced planes, with access steps at several points. A broad panel leads back on the center-line to a semi-circular gateway, opening into the surrounding forest. This triple-terraced area with its six distinct sections is for the cultivation of flowers.



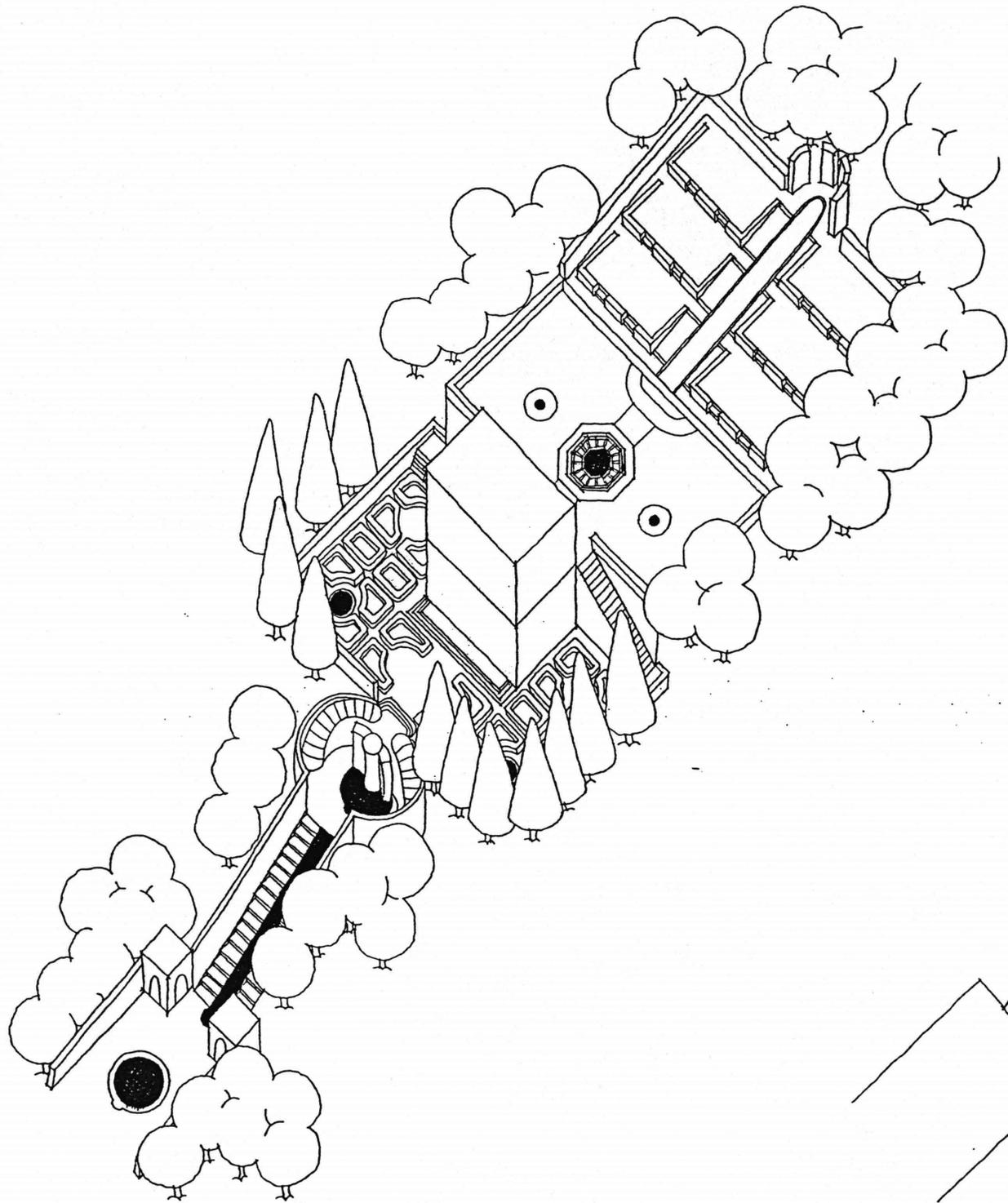


Figure 57. Villa Farnese (Overview)

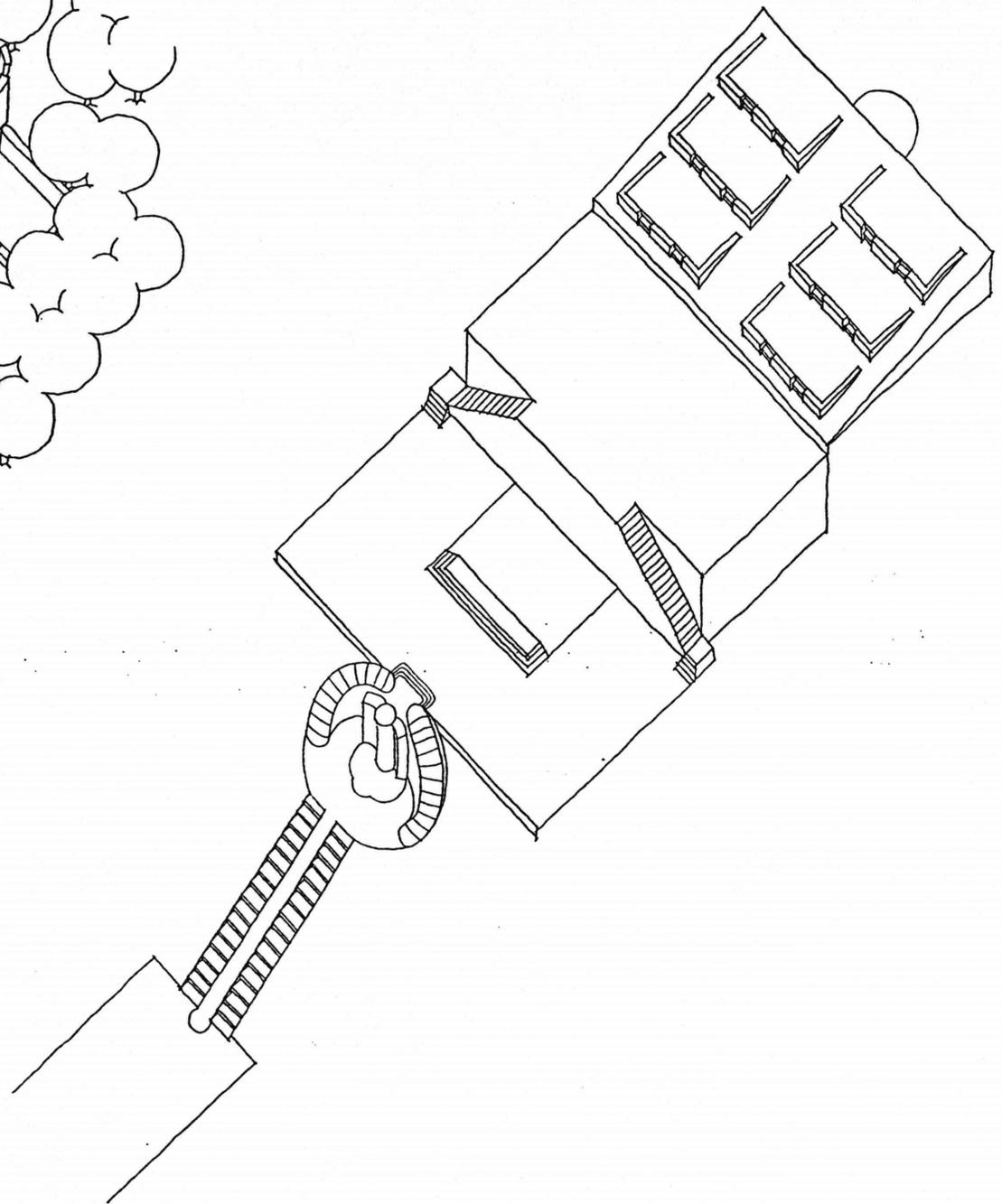
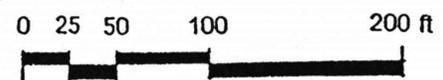


Figure 58. Villa Farnese (Terraces)



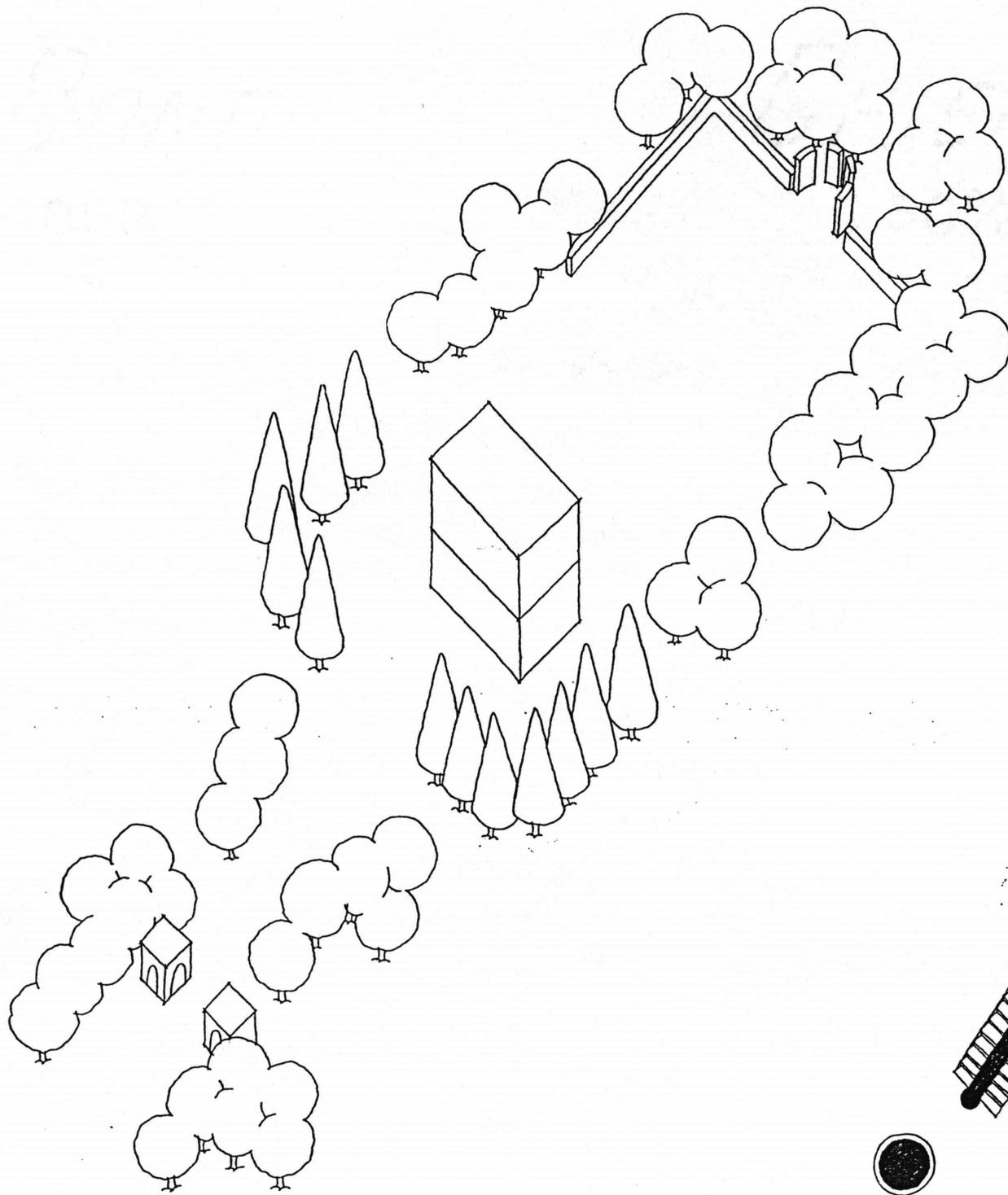


Figure 59. Villa Farnese (Buildings and Vegetation)

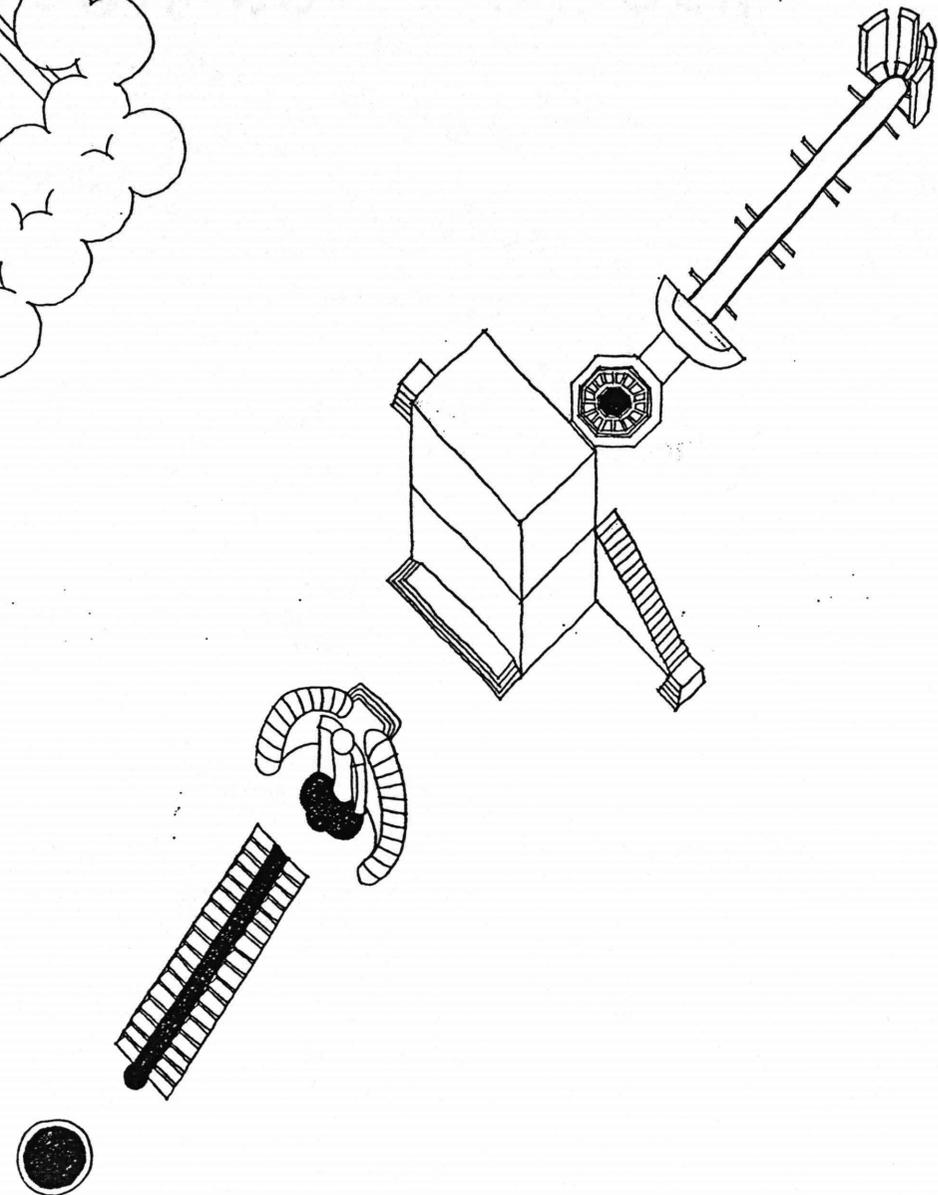
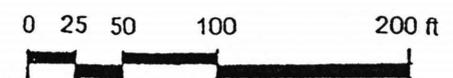


Figure 60. Villa Farnese (Major Paths and Transition Places)



## **Spatial Sequence in the Gardens**

This chapter presents results and implications of an examination of spatial sequence in the gardens described in the last chapter, presenting specific sequential patterns found and discussing effects and experiences of the patterns. The first section provides an analysis of spatial sequence in each landscape. Each landscape is analyzed in terms of change of level, change of spatial characteristics and transition place. The second section compares the landscapes in terms of context, physical, and spatial characteristics and of designed level change and sequence pattern. The last section discusses sequential effects and experiences of the three landscapes.

## **Korean Temples**

Korean Temples are located on moderate to steep slopes in the mountains. They use surrounding natural elements such as forests and streams as boundaries, instead of having walls or fences. Korean temple sites usually start with a gate and end in the forest. They are highly axial landscapes, but sometimes the axis moves slightly along the existing topography (Figure 2 and 3, p.15). Designers use the natural topography to enhance spatial sequence. However, the sequential pattern is the same even for a rather flat site.

### ***Change of Level***

Temple sites are levelled into two to four big terraces, with numerous small level changes. Level changes between terraces are usually greater than 5 feet, except Tongdosa, which is located on a rather flat site. They clearly separate upper spaces from lower ones, both visually and physically. The level changes, either small or big, are connected by the steps on the axis. Most buildings are on platforms, and some major ones have steps on their platforms. The platforms and steps in Tongdosa especially create the effect of adding a third dimension to the flat site. The steps, mostly simple in shape, are an important landscape element in the temple, directing movement of people, showing human scale at the huge terraces, and highlighting major buildings. The design and material of the steps show hierarchy between buildings. The ones around the main hall have sculptured balustrades and are constructed with refined stones (Figure 14, p.23, Figure 18, p.26, Figure 22, p.29 and Figure 26, p.32).

### ***Change of Spatial Characteristics***

The spatial function gradually changes from the processional space at the bottom, through the main space, and sometimes to the special space at the top. Each space is clearly separated from the others with a big level change. The spatial characters such as form and enclosure also change from space to space. The characteristics enhance the functions of each space (Figure 15, p.24, Figure 19, p.27, Figure 23, p.30 and Figure 27, p.33).

The processional space tends to be a long and narrow corridor, enclosed with tall trees and low walls. Usually, it has three gates and a pavilion. The ground rises continuously. The big level change before or under the pavilion marks the end of the space. The successive gates and the rhythmic rising along the passage make movement interesting and increases the viewer's anticipation of the next space. The next main space is wide open. It is mostly divided into two smaller spaces by a topographic change before the main hall. The lower space is a courtyard enclosed by buildings. It is the location of major events and gatherings. The main hall is designed to be ascended to, by being located at the end of huge flights of steps. Usually around the main space are some minor spaces for the priests. They are distinguished from the main space by a slight level change. Thus each minor space tends to have its own ground level and a courtyard. It makes each space identical. The end of the sequence is a

special space which is totally separated from the previous spaces by high level change and walls. It gives the space a mysterious atmosphere (Figure 17, p.26 and Figure 25, p.32).

Usually the view to the outside is closed until one reaches the main hall. Only on the terrace of the main hall can one see the whole temple site and surrounding valleys and mountains. Thus, the viewer's fulfillment when arriving at the final destination is dramatically increased.

### ***Transition Place***

Each temple has one major path along its axis. Some temples have more than one path, but only in the main space. If the axis moves, the path also moves. Transition places, such as steps, gates, pavilions, and main features, (such as main hall and sacred tower), are on the axis. Thus, sequential experience primarily occurs along the axis (Figure 16, p.24, Figure 20, p.27, Figure 24, p.30 and Figure 29, p.33).

Each transition place has a level change and is marked by a pavilion or gate. This makes a clear separation both visually and physically and provides a strong and dramatic sequential feeling. Basically transition occurs on the steps and has several typical forms combined with the steps. Steps and gates along the processional space provide an upward and inward sequential feeling. Especially, successive gates along the space show symbolic meaning, representing several conceptual boundaries of the temple. The first gate, with a roof to symbolize entrance and columns to differentiate symbolically the inside of the temple from the outside, is a symbolic boundary which differentiates temple site from the surrounding nature. The second and third gates, which have small open rooms and symbolic features who guard the temple against evil, symbolize mental boundary between religious world and non religious world. The final gate after the main space is an entrance to the sanctified space, the symbolic heaven. The gate is symbolic of the division of heaven from earth. The gates also act as a visual frame and thus increase interest and anticipation of the next space. Pavilions, which are usually located on the big topographic change between the processional and main spaces, screen the upper space completely. The path goes under or around the pavilion. The sudden big opening after the dark and narrow path under the pavilion makes the sequence vivid. The final transition place behind the main hall has steps combined with a gate and walls. This clear separation and the highest location create the sacred space's mysterious atmosphere.

Level changes perform important roles through the whole sequence by themselves or in combination with other landscape elements, such as gates, pavilions, walls. Ascending is of primary importance through the whole site. Thus, it has upward movement and different level change patterns have been utilized for different effects. Rhythmic rising is emphasized in the processional space, whereas dynamic and overwhelming experience is provided in the main space. The steps to the special space emphasize a point of entrance to a mystical place. Ascending, kinesthetic experience is enhanced with framing vision (as in a gate), using contrasts of dark and light, and open and closed (as in a pavilion).

## Mughul Gardens in Kashmir

Mughul gardens in Kashmir are located at the foot of the mountains near the Lake Dal. The design is simple, axial and geometric. The gardens are enclosed with walls and are clearly distinguished from the surrounding countryside. The gardens start from the lowest place, and entry is marked by a gate. The entry passage is also designed with planned sequence. The gardens are designed to be reached by boat through the lake and the inner canal which is lined with trees. Sometimes a bridge is designed to separate the inner lake from the outer lake, and thus emphasize sequential movement. Moderate slopes along the foothills are used for water movement in this hot and dry region. Usually the spring on the highest place marks the end of the garden.

### *Change of Level*

Mughul gardens in Kashmir have upward movement and are designed to be entered from the water level. Basically the mild slope is used for water movement, and thus topographic change is designed to provide needed gravity for the water canal. A water canal turns into a water cascade or a water chute at each dropping and thus has the effect of emphasizing level changes.

The sloping plane is levelled into three to twelve terraces. One to three terraces among them have big topographic changes and the others have small changes. The even and moderate change of level through the whole site provides for a subtle and rhythmic sequential feeling. The level change relieves the monotony of the axial garden and adds a third dimension to the otherwise flat site (Figure 30, p.36, Figure 34, p.41, Figure 38, p.46 and Figure 43, p.49).

Each garden is differentiated from the other by a subtle change of level. Two sets of steps connect all terraces. They are in a simple shape and show paths in the open garden. The steps, the paths lined with trees and level changes give human scale to the huge garden. Here the steps and the terraces serve to give subtle variation to the overall impression of a unified garden.

### *Change of Spatial Characteristics*

Mughul gardens are typically composed of three different gardens—the public, private and zenana garden. These gardens are sited in a sequence from the lowest. Spatial characteristics such as form and enclosure also change with the spatial functions. All the gardens are squared and vary in size. The private garden is the biggest and the most open space, although it is partially enclosed with trees. On the other hand, the zenana<sup>2</sup> garden is the

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<sup>2</sup> "Zenana" means relating to women or for women in the Urdu script.

smallest and the most enclosed space with walls and trees (Figure 31, p.37, Figure 35, p.42, Figure 39, p.47 and Figure 44, p.50).

The public garden is the lowest one. The one in Shalamar Bagh (Figure 29, p.35) shows simple landscaping comparing to private and zenana gardens. It has a central water course and shaded paths. A topographic change separates it from the private garden. The private garden or the pleasure garden in the non-royal garden is a major part of the whole garden. It is levelled into several even and moderate topographic changes. It has water pools with jets and several water cascades on the axis. Paths, sometimes as raised causeways, are located at the sides of the water canal. The zenana garden, which is separated from the others with a big level change, is a rather small and intimate place, compared to the preceding gardens. But since it is located on the highest place, it provides the best outward view. Here is a water basin and a pavilion. The canal starts from this terrace and makes the biggest cascade at the end of the terrace.

Along the movement, the view is also changing. As one rises, forward mountain background views become closer and backward countryside views become wider. Finally, at the zenana garden, the whole surrounding view comes into sight.

#### *Transition Place*

Mughul gardens in Kashmir are highly axial gardens and usually have one axis. But sometimes they have some cross axes as in the Shalamar Bagh (Figure 6, p.17) or some minor axes as in the Achabal (Figure 5, p.17). The water canal and main features such as pavilions and thrones are on the central axis, and the paths are laid at the sides of the axis. Thus, the actual sequential experience occurs at the sides of the axis. They have straightforward sequence, and this linear sequence is emphasized by the water canal and the rows of trees (Figure 32, p.38, Figure 36, p.43, Figure 40, p.47 and Figure 44, p.50).

The water canal and steps connect all terraces. They provide a strong unity and continuity to the whole site. Water which flows sometimes under a pavilion or a stone throne especially heightens this effect. The paths or the causeways are designed so that viewers can enjoy and explore the water activity fully.

Since each garden is differentiated from the others with level changes, transitions primarily occur at the steps and are usually marked by pavilions. But the level changes are small, except the one before the zenana garden. These small changes separate spaces physically, but visually they are interwoven. It makes the transition rather loose.

Transition places basically have combined forms of steps and cascades. Steps combined with water cascades or chutes provide a dynamic experience, with the contrast of opposite moving directions. Gates or pavilions which mark the entrance to the garden become the focus or landmarks in the big open space. The separation of the zenana garden with high walls and trees make the space mysterious.

Water landscape is very important in this hot and dry region. Thus, sequential experience is primarily focused on water activity. Water sound and touch, as well as view and flowing pattern are emphasized. Shade is also important in this region, and the paths and water canal are shaded for a cooling effect. Pavilions provide another exciting sequential experience. They frame the view to the next space and provide a good outward view. The water flow under the pavilion makes the pavilion cool and pleasant.

## Italian Villas

Italian villas are mostly located on steep hillside slopes. They use natural topography creatively to enhance pleasure in outdoor spaces. The design is highly axial, geometric and symmetric. They have one strong axis, but exceptionally Villa d'Este has several minor axes and cross axes (Figure 10, p.20). The villas make clear boundaries with walls and trees. Thus, they separate highly cultivated spaces from the surrounding natural woods. Usually the gardens start with an entry gate.

### *Change of Level*

Gardens of Italian villas are composed of several terraces and slopes. The terraces proceed toward the house, as at the Villa d'Este, or downwards, as at the Villa Lante and Villa Garzoni. The largest topographic change is in front of or at the back of the house. Each terrace is distinguished from the others with a high level change which is primarily used for a spatial separation. Thus, the spatial sequence becomes vivid at each level change. The level change is highlighted with a water activity such as a fountain or a cascade. Unlike the other landscapes, here sloped planes are also actively used for the water movement (Figure 46, p.52, Figure 50, p.56, Figure 54, p.60 and Figure 58, p.63).

Two sets of steps connect all terraces. They purposely avoid the central axis and are laid at the sides of the axis. The steps, with various shapes and patterns, are used as stages and emphasize movement.

The steps and the terraces lead from one region, one mood, to another region and a different mood. This different moods from terrace to terrace provide a dramatic sequential experience. The different shapes of staircases, such as diagonal or oval, increase this effect by changing direction of movement and thus of vista.

### *Change of Spatial Characteristics*

As one moves along the axis, spatial character changes from artificial space to natural space, from wide, open space to narrow and enclosed space. It creates a progressive sequence. Changes of water from still, quiet pools to running, noisy cascades or vice versa also provide progressive sequences (Figure 47, p.53, Figure 51, p.57, Figure 55, p.61 and Figure 59, p.64).

The gardens are usually squared, except the garden of Villa Garzoni. As one rises, open spaces turn into narrow and enclosed spaces, and thus, one moves from bright spaces to shaded dark spaces. Usually the bottom terrace is used for parterre which is made of fine and formal landscaping. Upper terraces are wooded, natural spaces. They provide an excellent opportunity for viewing the countryside.

As one goes up, the forward vista is shortened and highly focused on the central axis. In contrast, the backward view is widened. This contrast creates a dramatic effect. An open panorama after wooded stairways gives this effect, too.

#### ***Transition Place***

The villa gardens usually have one main axis. Exceptionally, Villa d'Este has several minor axes and cross axes. Water, whether visible or invisible, follows the central axis, and main features such as fountains, cascades and buildings are also on the axis. Usually paths avoid the central axis and are laid symmetrically at the sides of the axis. But in the Villa d'Este, major paths are on the axes. Transition primarily occurs along the axis, whether at the sides of or on it. Thus, they have a very straightforward sequence which is progressive and dramatic (Figure 48, p.53, Figure 52, p.58, Figure 56, p.61 and Figure 60, p.64).

Large level changes separate spaces physically and sometimes visually. Every transition occurs on the level change and basically has steps which are mostly combined with fountains or cascades. Steps combined with fountains take an architectural form and work as a stage, providing thrilling experiences. Ramped steps with cascades create a dynamic sequence with a contrast of movement—upward or downward. Sometimes with balustrades, steps increase the interest of movement.

Sequential experience is primarily focused on rising and water activity. The combination of the two elements tends to create a strong sequential experience. Shade as well as water is also an important element in the hot Italian climate, like in Kashmir. Parterres of flowers increase sequential experience with fragrance and bright colors. Grottoes at the end of paths tend to give a dramatic sequential experience, with dark and light contrasts.

## Comparison of Three Landscapes

This section provides comparisons of three landscapes, especially focused on level change pattern. The landscapes are compared with context, physical characteristics and spatial characteristics.

In all three landscapes, level changes are primarily used for spatial separation. But the degree of separation within each landscape is different because of the amount of level change and the different supporting elements, such as walls and trees. Spaces in Korean temples are strongly separated, both visually and physically, by a gate, a pavilion and walls as well as a large change of level. In Italian Villas, spaces are also separated both visually and physically by a large level change and trees. In contrast, slight changes of level in Mughul gardens make spaces physically separated but visually interwoven.

Level changes are used to accentuate certain sequential experiences in these landscapes. In Korean temples, such changes are used to inspire religious disciplines and to show the hierarchy of spaces and buildings. In Mughul and Italian gardens, level changes are designed to provide pleasing sequential experiences, in conjunction with the water flow.

The designers of all three landscapes have attempted to provide good outlooking views with the height of the places. Especially, the designers of Korean temples. They have dramatized the viewing moment by concealing the view from a visitor until he/she reached the final destination at the top.

In all three landscapes, spatial qualities are changing along with the level changes. In Italian villas, the changes involve only landscape elements, such as vegetation and water along spaces, but the changes in Korean temples and Mughul gardens are more conceptual. Here the ambience of place are changing from profane space to sacred space in Korean temples and from public space to private space in Mughul gardens.

Since all three landscapes use level changes for spatial separation, the transition from place to place primarily occurs on the spot of level change. The transition points in these three landscapes all use steps as spatial boundaries or connections, but the resulting sequential experiences are different in each case. The transition points in Korean temples are designed to emphasize the moment of entering the next space, by means of contrast between narrowness and spaciousness and darkness and light. But, in Mughul gardens and Italian villas, transition places themselves are exciting places. They are full of water sound and movement, with water chutes or fountains. Especially the transition places of the Italian villas which are the most dynamic places in the garden, since the steps, with their sculptural forms, serve as stages of the moving activity.

As a way of exploring design aspects of spatial sequence, three cases of spatial sequence in formal classic landscapes have been examined with spatial relationships: change of spatial qualities and linkage of spaces. This study shows that each landscape has distinctive spatial sequence, and each sequence has a unique pattern in terms of change of level, change of spatial characteristics and transition places. In these formal axial landscapes, level change has been an effective sequential element and has been used for various sequential effects. The analyses of three spatial sequences and the comparisons of those sequences provide specific examples of how to design spatial sequence, especially for certain sequential effects.

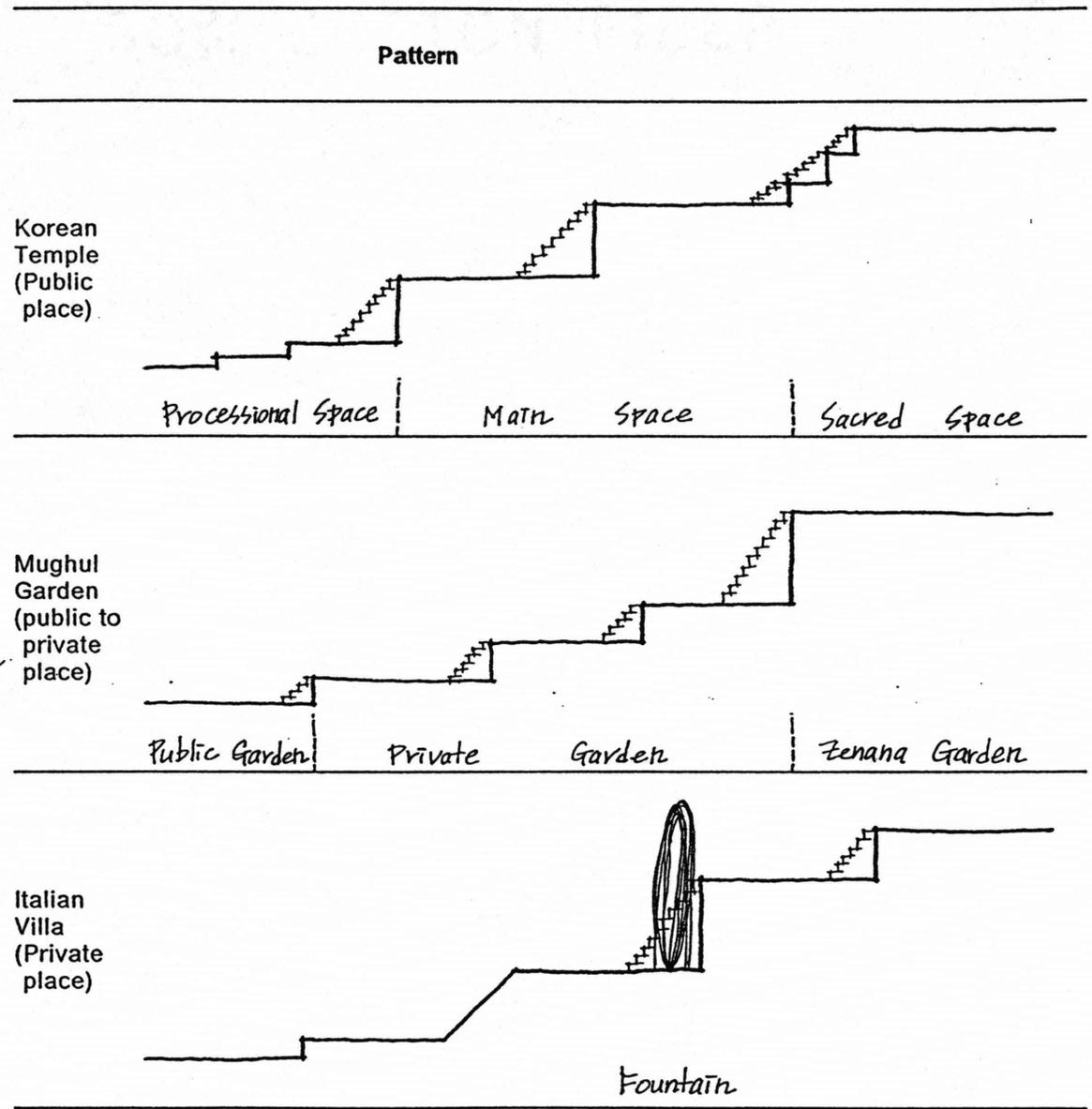
**Table 1. Context**

	<b>Korean Temple</b>	<b>Mughul garden</b>	<b>Italian Villa</b>
period	7 - 13 C	16 - 17 C	16 - 17 c
religion	Buddhism	Muslim	Christian
activity	temple	summer palace or residence	summer residence
public/ private	public	semi-public (public garden) private(private and zenana garden)	private
climate	mild	hot and dry	hot and dry
orientation of axis	facing south southeast southwest	facing south southwest	facing east southwest northwest

**Table 2. Physical Characteristics**

	<b>Korean Temple</b>	<b>Mughul Garden</b>	<b>Italian Villa</b>
location	hillside or mountain mountain	foothill/ plain	hillside
topography (slope)	various slopes (1.6-27%)	mild slope (2.2-9.4%)	steep slope (8.1-19%)
degree of level change	slight to large	low to moderate	large
terraces	2 - 9	4 - 12	3 - 4
elements located on terrace	buildings and stone structures, such as towers and lamps	pools, water canal and orchard	pools, fountains and parterres
steps	located on the axis, simple shape, combined with gate, pavilion, bridge, have balustrade	on both sides of the central axis, simple shape, combined with water canal, pavilion, no balustrade	on the axes or at the ends of the terrace, various shape, (oval, diagonal) combined with ramps, cascade, fountain, have balustrade

**Table 3. Level Change Pattern**



**Table 4. Spatial Characteristics**

	<b>Korean Temple</b>	<b>Mughul Garden</b>	<b>Italian Villa</b>
change of spatial characters	profane space to sacred space	public space to private space	man-made space to natural space
transition between spaces	separated both visually and physically by gate, pavilion and wall, as well as large change of level	separated physically but visually interwoven by low change of level, gate, pavilion	separated both visually and physically by high change of level and trees
spatial experience	different but building a spiritual mood	subtle	different ambience from one space to another

## Sequential experiences of three landscapes

Our landscapes have been shaped into various forms to meet our various desires. In the friendly environment, people have preserved or emulated beautiful landscapes to appreciate them. In the hostile environment, people have modified or even cultivated existing landscapes into desirable paradises. For a religious setting, people have kept the place quiet and undisturbed. For an entertaining place, they have changed the place into an amusing and enjoyable one. Depending on the contexts and purposes of places, people have wanted different spatial experiences and thereby designed the landscapes in ways meant to achieve these experiences.

Koreans, who live in a mild climate and have beautiful landscapes, hold the idea that man and nature are inseparable, a harmonious unit with each complementing the other. In designing temples, this underlying principle made them avoid artificial boundaries between man and nature, instead enjoying nature as it is. Therefore, the temples are designed to provide natural but religious experiences. In the hot and dry climate of India, a garden has been regarded as a refuge from the hostile environment. So the gardens in hot plains are strongly separated from the surrounding landscapes and artificially planted and watered to create cool and livable environments. In Italy, which has a hot but endurable climate and hilly landscapes, man treated nature in a more friendly manner and coexisted with nature peacefully. By sharply contrasting the man-made landscape with the natural landscape within the garden, they enjoyed both landscapes intensely. Here the gardens are designed primarily to be places for pleasure and amusing experiences.

These three landscapes show different attitudes toward nature and different experiences, which have evolved from the different contexts and purposes of the places. Here the designers of these places have developed unique designs to meet their unique needs and desires. Spatial sequence, as one design device, explicitly or implicitly was used to achieve the expected experiences and effects.

### *Korean Temples*

The spatial experiences of Korean temples are designed to provide harmonious relationship with nature. The buildings of the temples are hidden in the mountains and are comfortably sited along the mild contours. With this sensitivity in the placing of buildings, the wooden one-story buildings do not dominate the surrounding nature, instead they provide harmony between man and nature. This relationship with nature occurs inside the temple grounds as well as the outside. Instead of elaborate plantings within the temples, attention is focused on the surrounding nature. The low walls provide boundaries within the temple grounds but permit outward views, and the pavilions which confine the main space but provide the best views of the surrounding landscape. Thus, the spatial sequence of the temples provides a skillfully executed nature-related experience.

The sequence of spaces is carefully planned to inspire a religious but inviting experience. The outdoor spaces are clearly defined by the building clusters. The sequence of spatial experience is progressively more religious. This is done by increasing the sacredness of spaces from the processional space to the main space and the sacred space. The long processional space is designed to be a quiet and shady place so that people can prepare their minds before entering the main space. This mood is enhanced by the relatively intimate scale of the built environment (small gates, narrow paths, low walls, and slight level changes). The repeating gates, which have religion-related features and drawings, remind visitors of religious discipline and provide a feeling of awe at each entrance to a new space. Thus, the temples show well-tuned sequences for a religious purpose.

At the same time, this sequence of spaces presents a diverse and interesting experience, instead of a rigid feeling that strictly religion-oriented places often tend to provide. This interest and diversity is achieved through rhythmic modulation along the paths, varying levels of spaces, changes of space contraction and expansion, and diverse approaches to new spaces.

With delicate and repetitive variations, temple designers made the sequential experience rhythmical and intriguing. With its slight but even level changes, a long entrance way gives a rhythmical movement-experience. In Bumeosa, the processional space is designed to have approximately 1 ft rise in every 20 to 40 ft. This little but constant rising breaks the monotony of a long corridor and provides anticipation and a stimulating experience. Also, the free-standing gates in this space reinforce the direction of movement and frame the view to a next space, psychologically leading people to the inner space. Thus, once one gets into an entrance gate, he is drawn into inner spaces. With these devices, the sequence of movement provides an inviting experience.

The vividness of the spatial experience encountered in the main space is enhanced by the use of contrast. In the main spaces of Bumeosa, Hwaumsa and Haeinsa, a higher space, which is open and outward looking; is deliberately introduced through an enclosed and intimate space. This contrast makes each space more distinctive, and thus, makes the sequential experience exciting. The ascending wide stairs between spaces become one of the most noticeable experiences in the temples, since here contrasting spatial ambiances are experienced simultaneously. When the whole temple site and the surrounding landscape are revealed unhindered before the main hall of the upper space, religious inspiration is dramatically increased with the satisfaction of reaching the higher level. Here sequential experience is planned for both a religious and pleasing effect.

The rhythm of space contraction and expansion through the whole site provides another strong sequential experience. The highly enclosed space along the processional way opens up at the lower main space and then expands enormously at the higher main space to the surrounding landscape and finally closes down tightly at the sacred space with walls and trees. These fluctuations of spatial opening and closing coincide with the mood of the desired experience. A different enclosure of a space, as in the processional way of Tongdosa, gives another attractive sequential experience. While the north side of the space is blocked by a solid boundary of walls and trees, the south side is bordered by trees and includes the sound and smell of water with intermittent views of nearby streams.

Another deliberate spatial effect is achieved through the use of transition places and unusual approaches. Usually a big pavilion screens the next main space; and a path is purposely laid under or around the pavilion. Thus, once-halted spatial flow suddenly bursts into an open space. By dramatizing the moment of entering, the main space gains a sense of loftiness and

the main hall one of grandeur. Especially, the movement through dark and narrow stairrooms inside a pavilion in Haeinsa, exemplifies dramatic sequence by contrasting dark and light and narrow and wide. Also the sequence to a sacred space in this temple makes a mysterious but inviting experience. These are all designed to present a religious but engaging experience.

### ***Mughul Gardens in Kashmir***

The Mughuls have designed their gardens to provide a cool and refreshing experience. A water canal provides the central axis of a garden around which is planted with tall chenars for a cooling effect. The paths, which layed out in parallel manner from the bottom terrace to the top, are laid between the canal and rows of trees. The movement is designed to rise up the shady paths, seeing and hearing water activities to one side. Various water elements in the landscape increase this effect. A water canal runs down a garden, sometimes turning into water pools and sometimes water chutes or waterfalls. Thus, while ascending or descending, one experiences different water views, sounds, smells and touches. These changes of sensations cumulatively enhance a cool feeling.

In the large scale environment of vast plains and stupendous mountains, a sense of familiarity and intimacy is appreciated. Therefore, an intimate sequential feeling is also planned in these gardens. This intimate feeling is achieved through a careful laying-out of paths. In Nishat Bagh and Shalamar Bagh, the gardens are huge in scale, and the plantings are massive. But the paths are laid out close to the central axis so that people can appreciate even slight changes of waterflow. Water chutes are always guided by two flights of steps to allow people catch the finest flow patterns. Thus, the actual sequential experiences in the huge gardens become delicate and intimate.

Continuous and slight level changes along the central axis are also designed in response to the surrounding landscape . The small rises in the garden contrast with the steep mountains background and evoke a close feeling, by the contrast of scales. They also, using planting, created a progressive sequence of privacy, and thereby intimacy. In Nishat Bagh, the trees come closer to the paths, making distant views shorter and the paths more shady, until becoming informal and intense in the Zenana garden. By increasing spatial enclosure along movement, they designed to enhance a feeling of privacy and intimacy.

The approach to the garden entrance is planned with an unique sequence. The gardens are designed to be approached through the lake by a boat. Entering a garden from the lake would be a quite different, exciting experience. In Shalamar Bagh, by planting the approaching canal with tall chenar trees, the sequence is further articulated.

### *Italian Villas*

Italian villas were designed as summer residences in the hot region and built purely for pleasure. Thus, the spaces and spatial sequences in the garden are designed to provide various pleasing experiences. Sequences are carefully planned for specific effects by varying landscape types progressively, showing contrasts in sensations, making rapid level changes, or emphasizing transition between spaces.

To give diversity and interest along space-movement, the Italians deliberately changed landscape types from man-made to natural vice versa. In Villa Lante, the quiet pools and colorful parterres become rippling fountains and informal plantings at the upper terrace and turn into rushing cascades and natural woods at the top terrace. By changing landscape types the mood of the spatial experience changes progressively.

The Italians used contrasts in sensations along movement to magnify spatial experiences. In Villa Garzoni, a bright wide space, composed of parterres and pools, is experienced after a shady narrow corridor at the steep hillsides. The contrasts of visual scenes--natural to man-made landscape--and of sensations--dark and enclosed to bright and open, noisy to quiet, damp to odorous--along axis of movement make the experiences of each space more distinctive.

Italian villas, sited on steep hillsides, used existing topography in a positive manner to create desired sequential experiences. The Italians made steep slopes into flat spaces with high terraces; and the transitions between different landscape types occur at the high level changes. In Villa Garzoni, the natural wooded landscape suddenly turns into man-made landscape at a large level change. By introducing new landscapes after a rapid ascent or descent, the spatial transition is accentuated. This transition is often enhanced further by the some element, such as fountain-combined stairs or a complex of stairs. The circular stairs with a fountain at the center, in Villa d'Este provide a theatrical experience with a stage-like form. The stairways carved into the fountains, in Villa Lante, also provide a unique sequence by introducing movement right into the center of water activities.

The three landscapes have developed unique sequence design to achieve the desired spatial experiences and effects. These sequences which have evolved from the context and purposes of the places have made the sequential experiences unique and the places special.

## Conclusions

### *Summary of Major Findings*

A summary of major findings, implications of this research for design practice and education, and recommendations for future study are provided below. This research shows that the designers of Korean temples, Mughul gardens and Italian gardens deliberately used spatial sequence to elicit certain emotional responses and experiences specifically desired under the contexts and purposes of the places. Korean temples located in the mountains provide strong nature-related experiences, as well as religious and inspiring experiences. The temple designers created delicate, yet powerful sequential experiences with effective use of site conditions and landscape elements. The designers of Mughul gardens worked to create cool and friendly spatial experiences in the hot climate and vast landscapes. They utilized water and planting materials in various ways to provide a refreshing and intimate sequence of experiences. Spatial sequences of Italian villas are designed for the pleasure of their owners and thus show the most articulated design sequence. From the findings, we can conclude that the appropriateness of spatial sequence is related to the context and purpose of the place being designed and can be an effective design tool in satisfying desired experiences and thus in creating a desired sense of place.

Level changes, as one of sequential elements, have been used effectively to create or increase certain sequential experiences. In Korean temples, the irregular slopes of sites are shaped sometimes into even and constant rises or sometimes into a rapid rise to make various sequential effects. The Mughuls deliberately made small level changes out of flat plains to create an intimate sequence. The Italians used large level changes for contrast to create a vivid sequence.

### *Implications and Recommendations*

Since people in motion perceive environment in a sequence, spatial sequence is an important factor in influencing our spatial experiences. A good sequence may produce satisfaction and give a good impression of the place whereas a poor sequence may cause confusion or even disaster. The satisfactory experiences of a place and thus success of the place design largely come from the proper use of sequences. The three landscapes are good examples of making successful places with well-designed sequences. Spatial sequences in each landscape provide specific experiences and effects that the environment and the setting of the landscape

require. From the results, it can be said that the success of sequence design depends on the effectiveness of the resulting experiences and effects. Therefore, a good sequence will be a matter of fitness with its purpose and with the context in which it belongs.

Once this principle is understood, there is today rich opportunity for the creation of sequences in modern landscape design. Spatial sequence can be effectively used for certain purposes in the certain places. For example, sequences can be utilized for specific, such as economic or artistic, purposes. Properly designed sequences can make small places larger and artistic places, such as sculpture gardens or galleries, more impressive. Also, in the places which require specific experiences or effects, such as a religious setting or a theme park, sequence can be a fairly powerful design tool. By sequence design, the religious setting may get more divinity and the theme park may provide more excitement. Or in large, complex places, such as large parks, streets or cities, several types of sequences can be connected or combined to make one or various sequential experiences. In this case, the sequence of the sequences, like the sequence of spaces, will be another design factor. Further, a unique sequence may evoke a strong "sense of place" by making lasting impressions of the place. Thus, effective sequence design will make the place successful.

Today the education in the landscape professions emphasizes the economic and functional aspects of designing spaces. Convenient and economically wise circulation between spaces tends to motivate spatial sequence with less consideration of the resulting experiences. It makes it difficult to find successful sequence designs in modern landscapes. As designers care more about experiential responses along space movement, the places will give more satisfactory experiences. Therefore, education should help landscape architects to be aware of and be concerned with sequential experiences in designing spaces.

This research has focused on level changes as one of sequential elements of formal landscapes. If the relationship between design patterns and sequential effects are compared with those in flat formal landscapes, such as French landscape and Chinese landscape, and those in informal landscapes, such as the Japanese and English, the comparison will provide more insights to the use of landscape elements, specifically level change, for creating or enhancing certain sequential effects of places in modern landscape design.

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