

NEGOTIATIONS WITH THE LANDSCAPE: **A WINERY IN CALIFORNIA**

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Submitted to the Department of Architecture in partial fulfillment of the requirements of the degree MASTER OF ARCHITECTURE at the Massachusetts Institute of Technology
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ABSTRACT

This thesis concerns the design of a winery in the hills of northern California. The winery program was specifically chosen to ensure and illuminate the close partnership between landscape and building. While the industrial nature of the winery might appear antithetical to a landscape setting, the production of wine necessitates a dialogue between building and site. The design is an exploration of this tension and interdependence in architectural form.

Historical movements in European garden design, and the work of contemporary landscape artists are examined for examples of possible manmade interventions in the landscape. This spectrum of references shares in common the development of the potential of a site through the discernment and analysis of the character of the landscape.

The winery site has a clear physical disposition from which the form of the winery and vineyards are generated. The winery design is the result of negotiations with the site, and with the building's requirements as a wine producing facility.

Thesis Supervisor: Imre Halasz

Title: Professor of Architecture

ACKNOWLEDGEMENTS

I extend a warm thanks to Byron Schneider, Hassan Abouseda, Imre Halasz and Nina Kim, whose influence can be found throughout this thesis both as it is written and in the long process of its creation.

I also thank Gerry Stringer and Heidi Johnson for their generous help.

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PRECEDENTS

The purpose of my research in this thesis was to explore precedents for working with the natural landscape. I was in search of an attitude. And I looked less toward buildings or designs for my answers than to points of view. I found these to be most explicit outside architecture and within disciplines that use landscape as their medium, such as park and garden design, and landscape art.

Garden design by its very definition is a domestication of the landscape, expressing the interaction of man and nature. It regards nature as fair game: an open slate for revision for the delight of the garden's users. All garden movements modified nature to some extent. The evidence of manipulation could be disguised behind greenery, or on the other extreme, the modification might overpower the character of the existing place altogether.

European garden design underwent an enormous shift in orientation from the formalism of Versailles to the liberal attitude of English landscape gardens. In this shift, high formalism's contempt toward the unsuppressed natural landscape

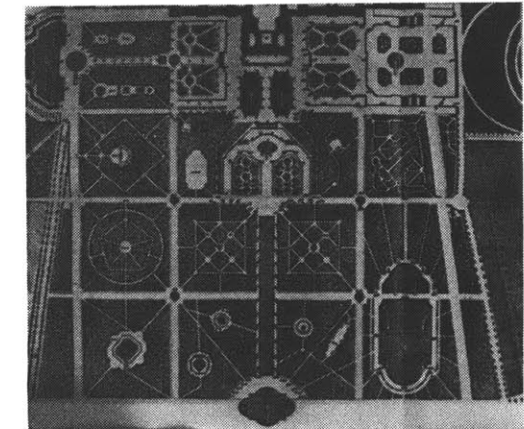
was succeeded in the English garden by an attitude of near reverence for the natural environment, where the influence of the landscape designer became virtually invisible.

The gardens of Versailles symbolize the enormous strength and influence of Louis XIV. While political boasting can account for the extravagant scope of Versailles, it shares the notion with formalist thinking that nature is intolerable without the perfecting influence of human intervention. At Versailles and other formal gardens, forests, vistas, and waterways were bent and manipulated – if not invented – by the hands of powerful men. Rigid geometry was applied to the landscape, ensuring its predictability. Plants were treated like building elements in the open. Topiary, not unlike the grooming inflicted on poodles, cropped natural plantlife into sculpture, arcades, and niched walls for the display of stone sculpture. The inversion of built and natural elements is especially clear in the plans of formal gardens. I think it is accurate to say that the formal garden was all built as architecture – from fountain to bush, nature existed on the

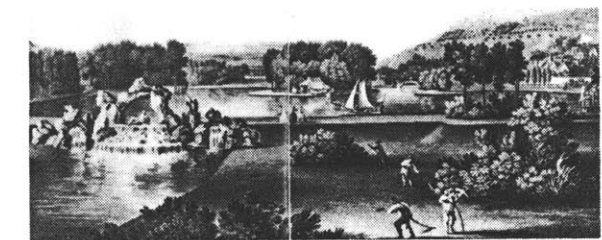
outside.

Unlike – and actually in reaction to – the formal gardens of France, the English landscape garden let nature be natural. Concerned less with the formal structure of the gardens that preceded it, the English garden relied on the less exacting, softer, but nevertheless explicitly designed relationships between landscape elements. This was a movement concerned with "improving" or modifying nature on nature's own terms. The landscape gardener worked in cooperation with a site. Capability Brown, for instance, (a popular and influential 18th century gardener) strove to develop the latent "capabilities" of a site, through the "inspired detection, analysis and encouragement of the genius loci, the spirit of the place." (Thacker, 1979) This suggests that a given site would have a limited amount of interventions appropriate to it and that the character of the site must be a determinant in the sort of manipulation it can tolerate.

If the formalism of Versailles and the informality of the English garden can be seen as defining two extremes, the gardens



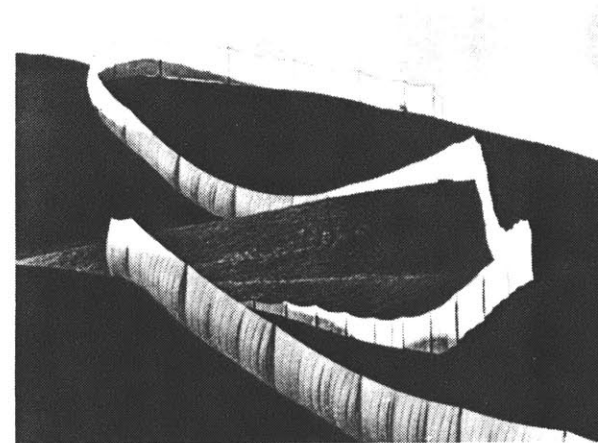
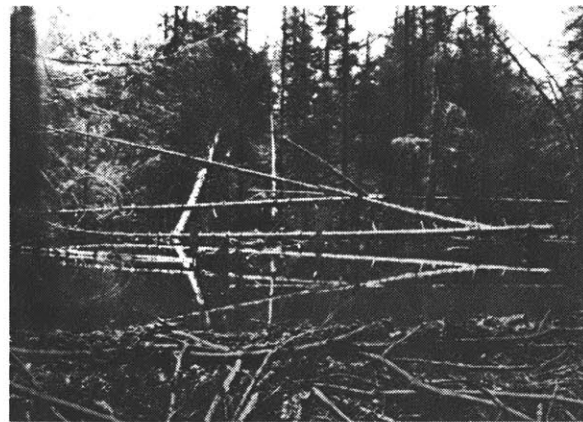
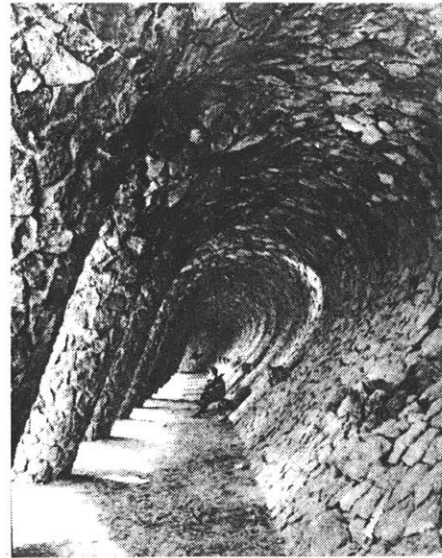
Versailles



landscape garden at West Wycombe

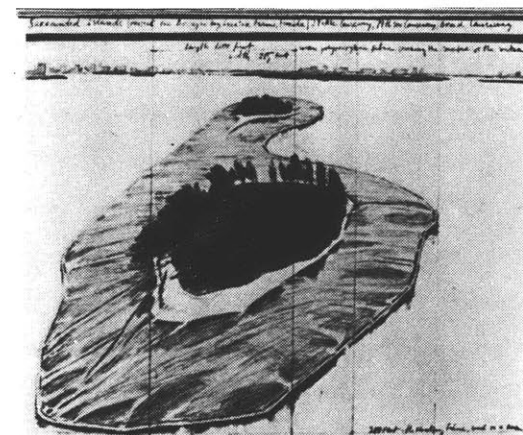
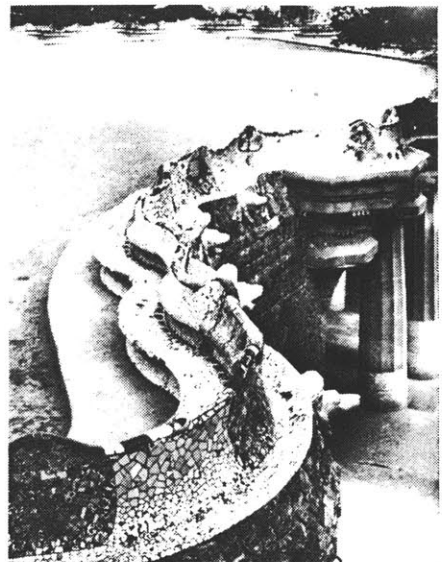


landscape gardens at Ermonville

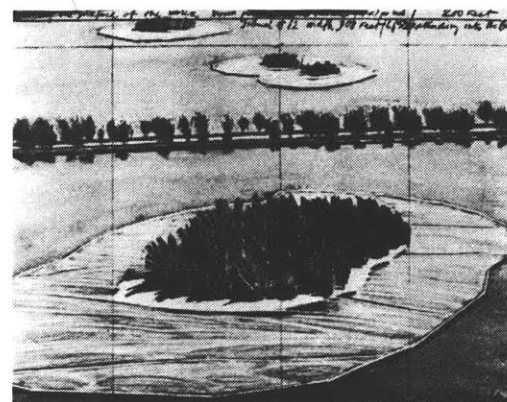


Situation Balance Series: Singer

Running Fence: Christo



Lily Pond Series: Singer



Surrounded Islands: Christo



Parque Guell: Gaudi

of the Italian Renaissance take a moderate position in the issue of intervention in a site. The Renaissance garden is comfortable augmenting the existing character of a site with natural and built elements. The environment exhibits clear evidence of human intervention, but it complements and respects the personality of a site. Symmetry is not forced, and the unexpected is encouraged.

The Renaissance garden reveals that the respective concerns of the landscape and formal gardens need not be mutually exclusive. The Renaissance garden constructs a dialogue between the natural and the made; this dialogue in the formal and landscape garden is weak at best. Gaudi's Parque Guell in Barcelona is a contemporary illustration of the principles of the Renaissance garden. Parque Guell gains its power precisely from its departure from nature on the one hand, and its communion with it on the other. It is the quality of this dialectic that draws me to these gardens, and is an element that I wanted to manipulate in the winery site.

The evolution of my own attitude about how to work with the winery site is closely reflected by the following quote by Michael Singer:

"...I wanted this to look accidental, unintended, as though a work of nature. There was to be no human presence;

perhaps because I was still trying to understand what my own presence in this natural environment should be. I cut trees so they would split as though a windfall caused such an occurrence. I painted many of the cut ends to conceal the whiteness of the raw wood. It became an absolute rule that there should be no sign of human presence. Part of my obsession about the absence of humans in these works came from the shame I felt about being part of a culture that has systematically destroyed the natural environment. Western culture views man at the top, controlling nature, apart from it. When nature is conquered, confined, controlled, man is safe. In order to experience and learn from the natural environment I felt the need yield to it, respect it, to observe, learn and then work with it. This early rule that I had, to not allow my presence in the work was helpful, in this yielding and learning process. Eventually I accepted my role in the environment as more than observer, manager, researcher. I understood this role as an artist."

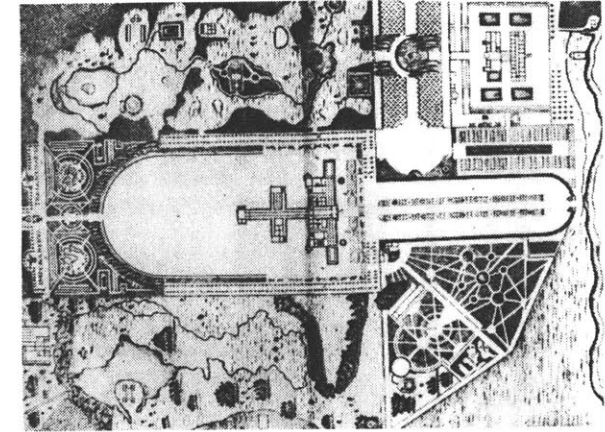
(Waldman: 1984)

In spite of his initial hesitation, Singer's work is concerned with the dialectic between the natural and the made. The sculpture "Situation Balance Series: Beaver Bog" to which he refers in the preceding quote, blurs the distinction between what is controlled and what is natural. But it is the hint of an artificial or constructed presence in the work that makes it meaningful. The closeness between what is made and the natural context, creates a tension that engages the onlooker in an evaluation of what is perceived and what is illusory; what is built and what is

accidental. Singer's "Lily Pond Series: 7/75" is similar in effect to the Beaver Bog. It is a delicate construction that inspires contemplation of a place by virtue of its physical counterpoint to the heavy-set surroundings.

Singer works within the environment of forests and grasses, rather than with the character of the ground form itself. Christo, in contrast, works with the primary structure of the land. Running Fence, Valley Curtain and Surrounded Island are all enormous projects that illuminate the physical disposition of ground form. He accomplishes this by inserting constructions that are clearly man made, and which complement the specific nature of each site through an exaggerated manipulation of what I am calling a dialectic.

All of the work I have cited so far, except the work of high formalism, are examples of interactions with the landscape that first take into account the character of the natural context. Whether the aim is to complement or contradict the landscape, the structure and form of the landscape must first be recognized. This task assumes the existence of a physical language or genius loci inherent in the landscape.



gardens at villa Gaspero Massini

gardens at villa Farnese, Caprarola



READING THE SITE

The character of a landscape is determined in part by the ground surface. The theorist Norberg Schultz has developed a distinct vocabulary for describing the generic components in a landscape:

"...the plain makes extension as such manifest, whereas valley is a delimited and directed space. A basin is a centralized valley, where space becomes enclosed and static. Hills and mountains are spatial complements to valleys and basins, and function as primary space-defining "things" in the environment." (Genius Loci, 1980)

These components are enormously influential in establishing a landscape's character, and are the elements with which Christo works. But not all landscapes have a well defined surface relief, and some may be dominated by elements other than the ground. Norberg Schulz's terminology, once again, is helpful in quantifying landscapes that require further description. His classification of landscape – romantic, classical and cosmic – is determined most significantly by scale, measured by the interaction of earth and sky. In the "romantic landscape" for instance, the sky is made inaccessible by the canopy of trees

of the forest, making it, in Norberg-Schulz's terms, an "interacting multitude of unintelligible detail." The romantic landscape incorporates sizes from the human scale to the microscopic. The "cosmic landscape" on the other hand, is unpunctuated and scaleless. It is the barren plain which contains no individual places, and where the extension of the sky is unobstructed. The sizes in this landscape are without description: the first measure of anything less than infinite is the space between sun-up and sun-down – the course of a day.

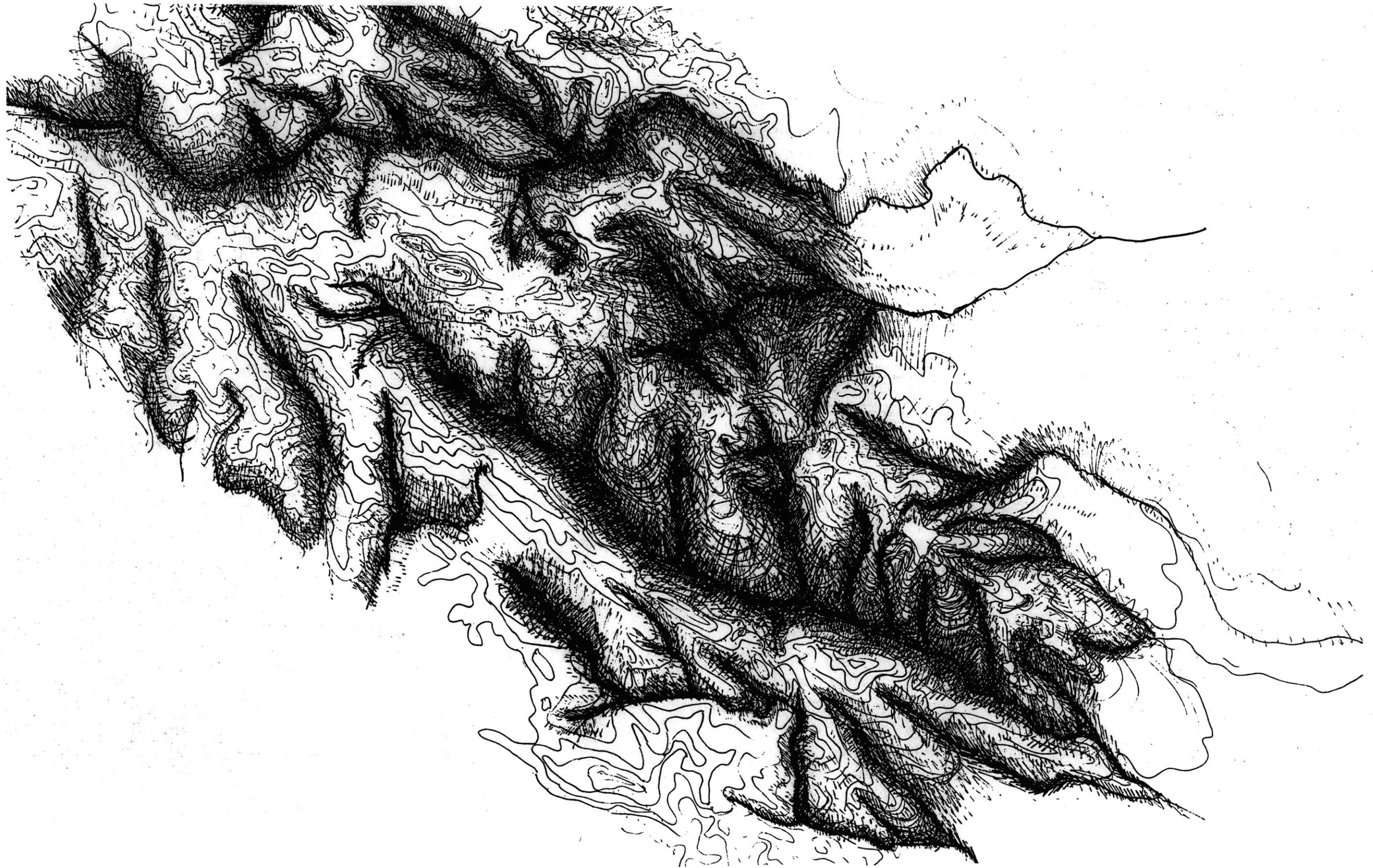
In Norberg Schulz's syntax, the region of California in which I am working has the character of a "classical landscape... a meaningful order of distinct, individual places." It is not an abstract place, larger than human activity, nor a microscopic one, but a landscape which is understood in relation to one's self. As Norberg Schulz points out, the Greek man found himself in nature. This is not to say that the land is anthropomorphic; that the sizes in the landscape can relate literally to the human body. I would rather describe its

size as relating to the scope of human vision and stride and inhabitation.

It is interesting to turn to the dictionary definition of landscape: "a portion of the land which the eye can comprehend at a glance". This definition relates to the 18th century English fashion of seeing the landscape in pictorial terms. In fact garden designs were modelled after paintings of classical scenes, and so became a series of landscape pictures (Thacker). The site I am using is well characterized by this. It has several distinct regions within close proximity to one another, each with its own character. In the process of moving through the site one encounters scene after scene, with views that lead out of the site to the valleys beyond, or to others internal to the site. I attribute the variegated character of the scenery in the site to a strong language defined in the ground surface itself.

The spatial properties of the site are remarkably clear. The surface relief is undulating and smoothly articulated; it is exceptionally continuous like a taut skin, or an object with a layer of new snow over





it. The surface topography is undisturbed, and is the primary physical element in the landscape. The trees (mostly oak and some pine) and other vegetation are distinctly secondary to the ground form.

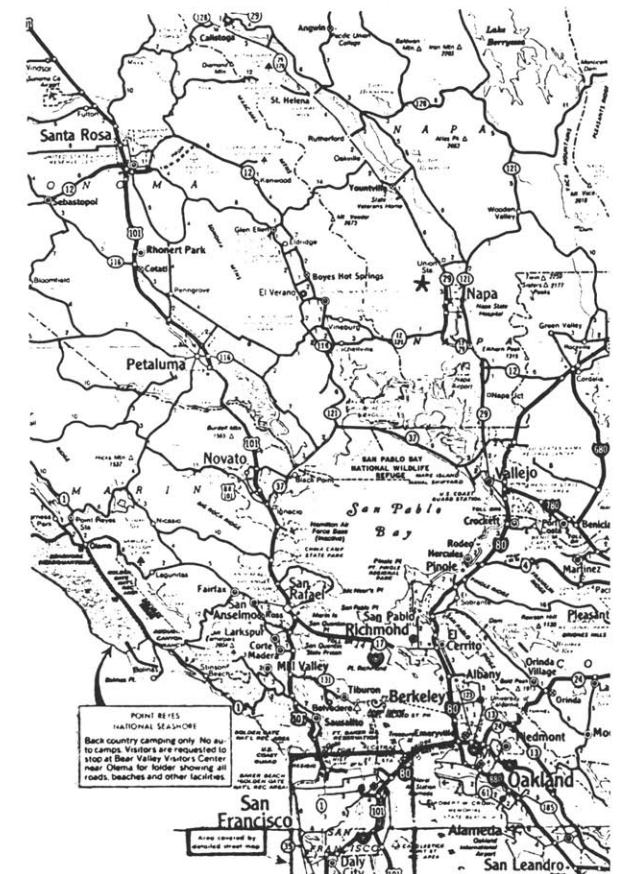
While standing in the winery site and taking in the view to the east and south, one is conscious of the forces of the larger physical reality in which the place is nestled. There are simultaneous impressions from diverse sizes; a characteristic which makes the western landscape so exhilarating. The site itself, "classical" with respect to dimensions that relate to the human body, constructs the foreground against which the much larger Napa Valley and its contributing valleys can be understood.

The winery site is located on the massif that lies on the western edge of Napa Valley in California, a region famous for its wine. Within this massif is a composition of ridges and valleys that, running in an approximately east-west direction, move perpendicular to the direction of the massif, and stretch out toward the agricultural valleys. The winery site is situated on one of these east-west ridges, located about three miles to the west of the town of Napa. The line of the ridge that comprises the winery site

shifts significantly to the north and then resumes its east-west course as before. This shift forms the most physically articulated section of the winery site. A sort of fragmentation is created by the shift: sizes are broken down and the ridge splinters into thin fingers that dissipate the force of the motion of the ridge.

The physical components of the site can be loosely described as fingers and knolls, which surface above their "spatial complements" of drainages and basins. These elements are generally organized by the direction and movement of the ridge that presides over the site, and of which they are a part.

The concave features collect water and are typically choked with vegetation, exaggerating their self-contained nature, and reinforcing their distinction from the ridges and hilltops which are high and light, and have an outward orientation.

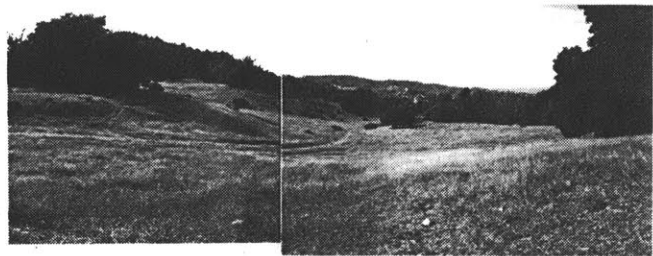




looking east

facing page: ground series I
1" = 400'

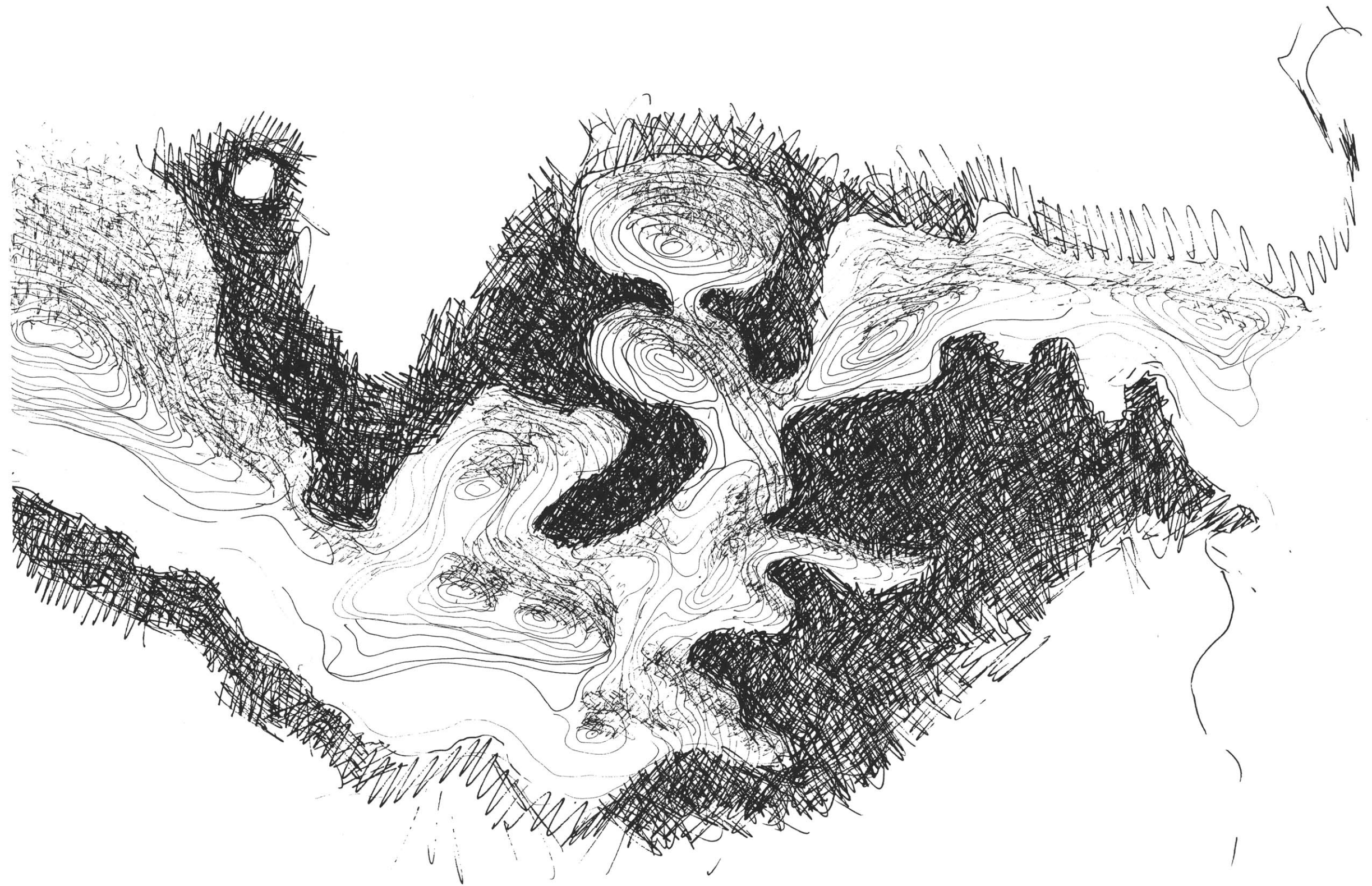




the building site

facing page: ground series II

1" = 400'

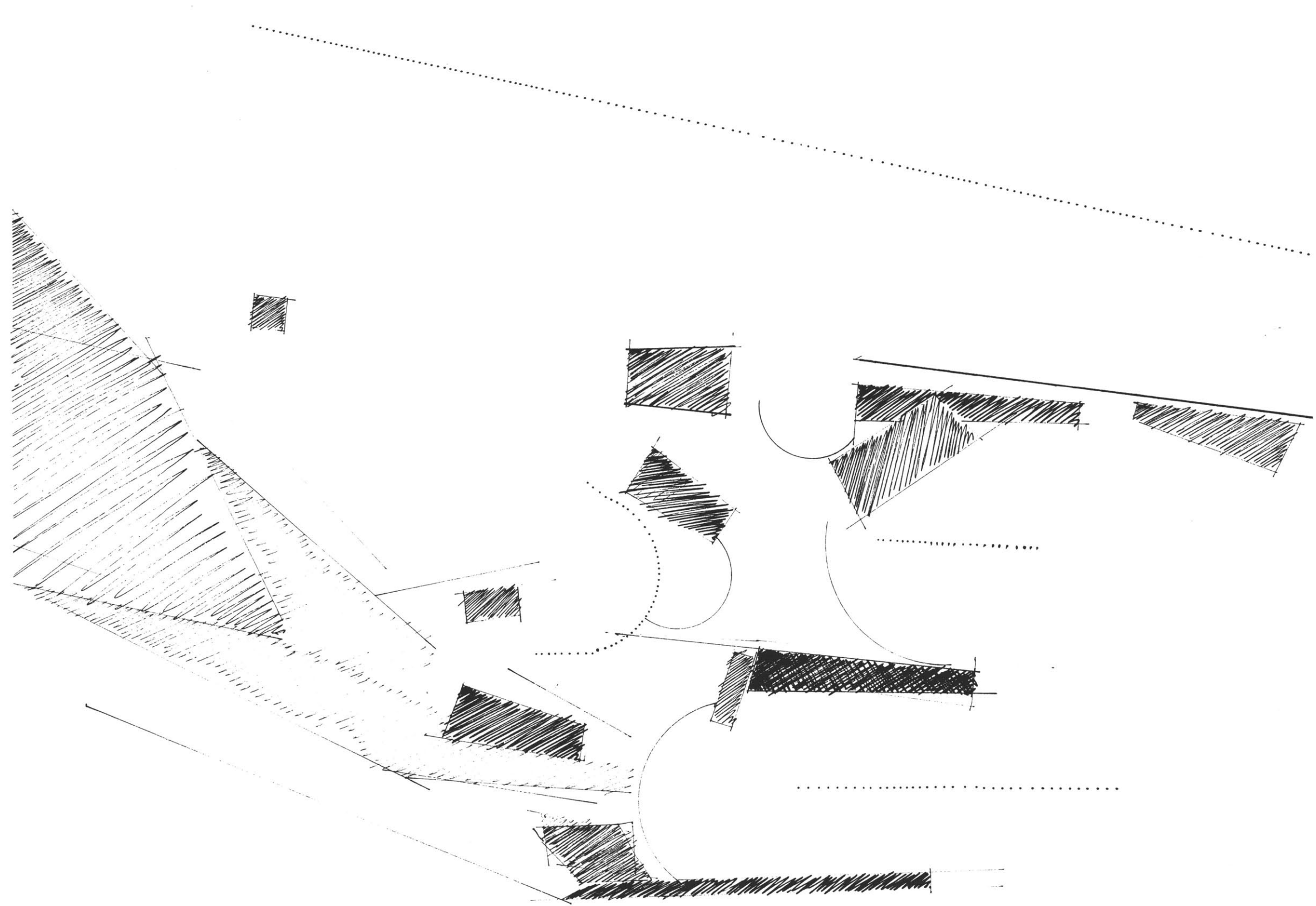




the ridge

facing page: ground series III

1" = 400'



WHAT IS A WINERY?

A winery is both farm and factory, producing a raw material and manufacturing a finished product on its premises. The vineyard and winery building are utilitarian environments, and are designed for objective, efficient operation.

California wineries attract an enormous number of visitors each year. (They are rumored to be second in popularity only to Disneyland.) The attraction is fostered by the tradition of the winery tour followed by complementary wine tasting, which is part of the sales effort. The tour is a critical means of promoting a winery's product. So, in addition to the task of simply producing wine, the winery is a host to large numbers of visitors who are allowed close proximity to the working aspects of the facility and vineyards.

The mechanics of wine production are very simple, and with only a few exceptions have not changed over the centuries. The bulk of a winery's space is dedicated to the storage of wine in its various stages of fermentation and ageing. This is a process that is internal to the wine, so is mechanically passive. The only areas of

heavy traffic in a winery are those that accommodate pressing and fermenting, or those that house the process of bottling. These are activities that are carried out quickly, require manpower, and deal with the transformation of the wine in one way or another.

VINEYARDS AND PRODUCTION*

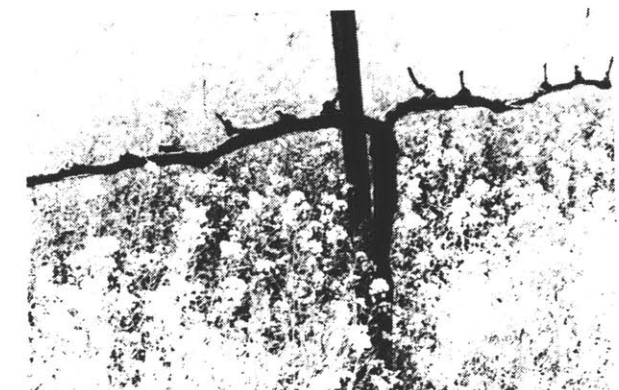
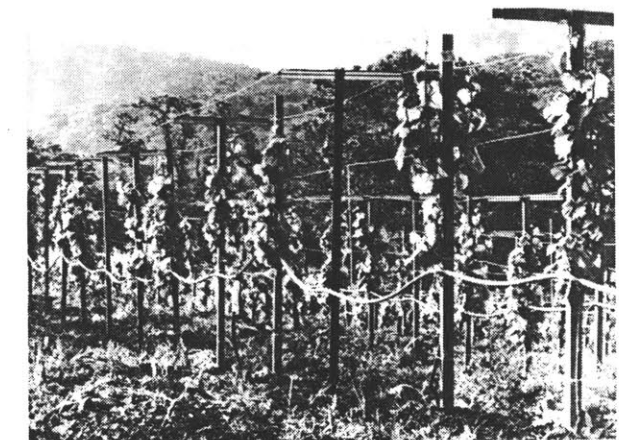
Two styles of planting are utilized in California. In the oldest method the vine stands independently in rows, and is well suited to Zinfandel grapes which grow in heavy, dense clusters. The second technique, used most often in California, attaches the vine to trellis wires that run the entire length of each row. The individual plant is overshadowed by the larger identity of the row.

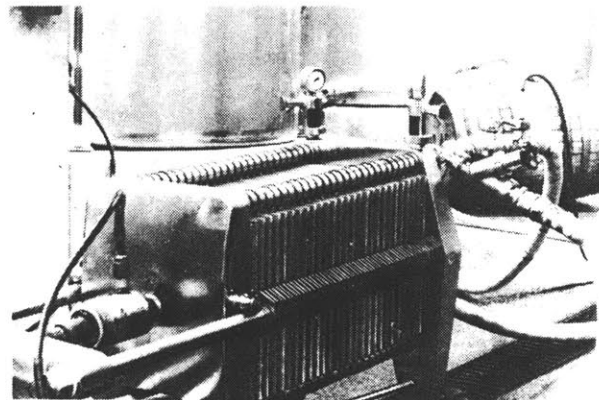
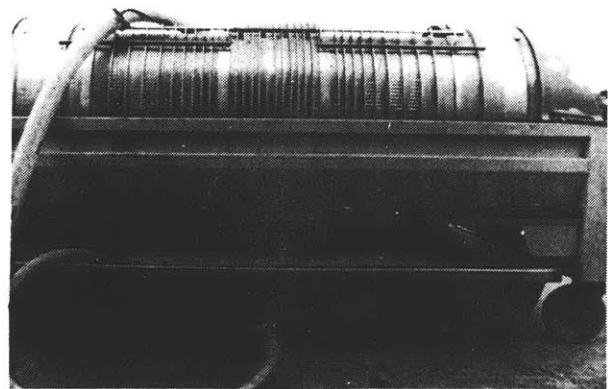
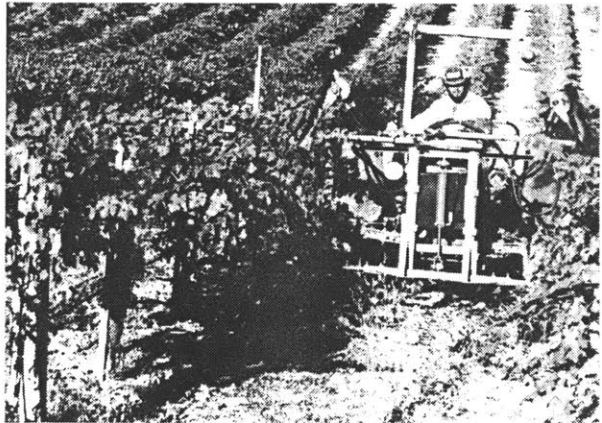
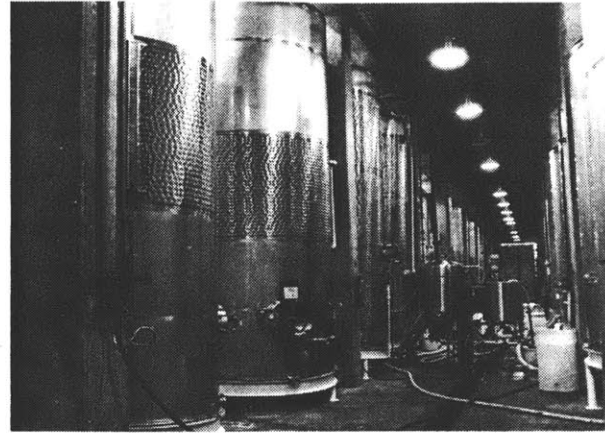
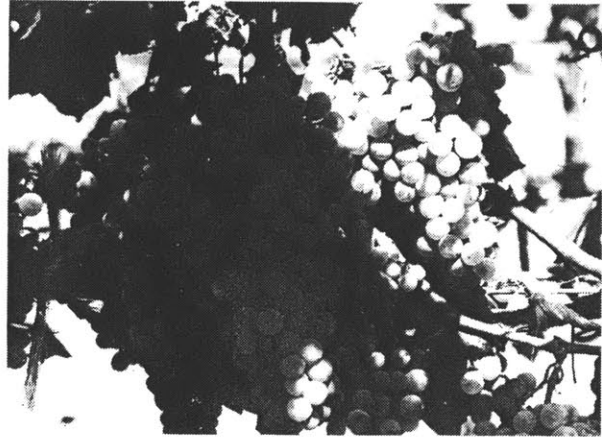
Grape vines require irrigation which is most efficiently accomplished with a drip system. This system uses plastic tubing which runs close to the ground from stake to stake and which allows a stream of drops to fall at the base of each plant.

Grape rows are spaced from ten to twelve feet apart to allow machinery to pass between them for cultivating, spraying and picking. Within rows, each plant is spaced six feet from the next, a dimension considered to be optimum for California Coastal Valleys. The length of rows is primarily determined by the configuration of the land, but is considered to be most efficient from about four hundred to one thousand feet. Rows are planted perpendicular to the slope if the site is steep, in order to prevent erosion, and to allow an ease of movement for pickers and machinery.

Ideally, vineyards have a southern or eastern exposure to the sun which prevents mold on the grapes, and at the same time shelters the vine from the burning effects of the afternoon sun. However, I have seen vines planted in every direction.

Grapes mature and are usually ready for picking from late August through October, depending on the variety of grape and the locale of the vineyard. A grape's readiness for picking is determined by its sugar content. Once the sugar level reaches the





optimum level of 19–24%, it calls for prompt harvesting.

Much of a winery's activity is seasonal, and this is particularly true of harvesting. Harvesting is a hectic season and a winery's labor force can more than double. Grapes are picked by hand so as not to break the skin of the grape. The grapes are deposited into a gondola – a container on wheels – that waits at the end of the vine rows. The gondola is hauled by truck to the winery. This needs to be done quickly, because prolonged exposure to the sun is harmful to the picked grape.

The area of the winery that receives the grapes is a streamlined affair. A truck is weighed with its load of grapes, and then the gondola is overturned, tipping the grapes into a long metal trough. The truck returns to the vineyard, allowing the next truck to unload. This marks the beginning of the winery process.

The character of a winery's interior is as much a product of its machinery and tanks as it is of the architecture. Each phase of wine production is characterized by its own machinery. The grapes are first sent to the stemmer-crusher, a machine that washes the grapes, separates them from the stems and

leaves, and then breaks the grapes open.

If a grape is designated to become red wine, the crushed grape along with its seeds and skin is sent to the fermentation tanks. These are often enormous – carrying quantities like 50,000 gallons, constructed of stainless steel, and jacketed like a refrigerator to regulate the fluctuating temperatures created during the fermentation process. Wine is pumped twice a day from the bottom of the tank over the "cap" of grape skins and seeds that floats to the top. The contact of juice with the skins of a red grape extracts color and flavor from the skins and imparts it to the wine. This takes from one week to ten days. Much of the wine at this point can simply be drained from the tank, yielding "free run" wine and leaving the tank full of seeds and wet skins. Sending the skins through a press reclaims a significant amount of wine.

Unlike red wine, white wine goes straight to the press from the stemmer crusher, where the juice is separated immediately from the skin and seeds. After the juice has spent up to thirty-six hours in a settling tank where sediment is separated from the juice, it is piped to the fermentation tanks where it stays from ten

days to six weeks.

As fermentation comes to an end, the red and white wines require clarifying, a process that cleans the wine of sediment. This is accomplished by piping the wine from tank to tank, leaving the settled sediment behind in each step. Further clarifying is done by using fine clay, even egg whites, to help pull sediment out of the wine, and the use of filters and centrifuges is common.

White wines do not require aging beyond one year. Red wines are held in cooperage for no less than a year. They are aged typically in wooden barrels of varying size, species of wood, and flavor, which is determined by the preferred effect on the final wine. The winery relies on experienced tasters and an array of chemical tests to choreograph the outcome of the wine.

When deemed ready, the wine is filtered and then bottled, corked, labelled, and then warehoused or shipped to buyers.

**Much of the information in this section is drawn from VINE TO WINE, by Richards Lyon.*



WHAT I DID

The winery was conceived through negotiations with the site and its own requirements as a building and agricultural complex.

The design accommodates the utilitarian requirements of the winery and vineyards; incorporating dimensions and spatial relationships generated by the requirements of machinery and equipment on the one hand, and also the interaction of workers with the wine making and grape tending processes on the other. The processes of "work" and "observation" exist simultaneously, allowing the visitor selected glimpses into the workings of the winery.

The design also attempts to work with the site, recognizing it as a physical language, having a structure, dimensions, and form of its own. The interaction between the winery and site is a conscious attempt at initiating a dialectic between the built and unbuilt; the natural and artificial. By "dialectic" I mean an intervention that establishes and maintains a tension between these forces. This is achieved by introducing to the natural site built

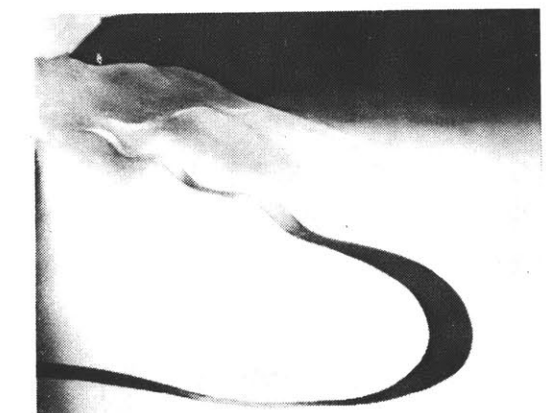
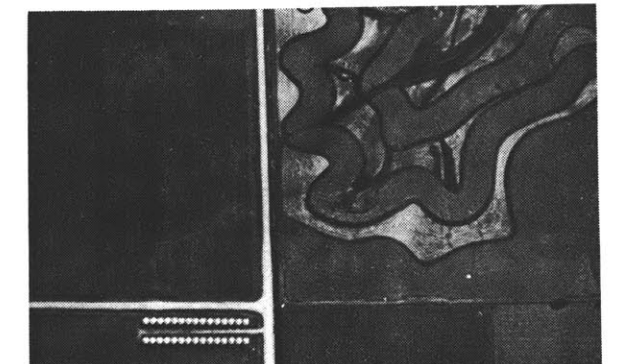
elements that are neither overpowering nor timid.

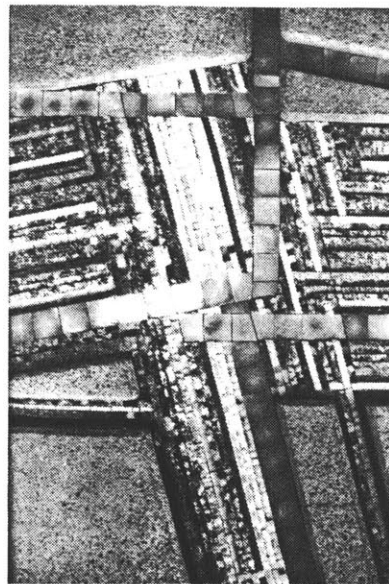
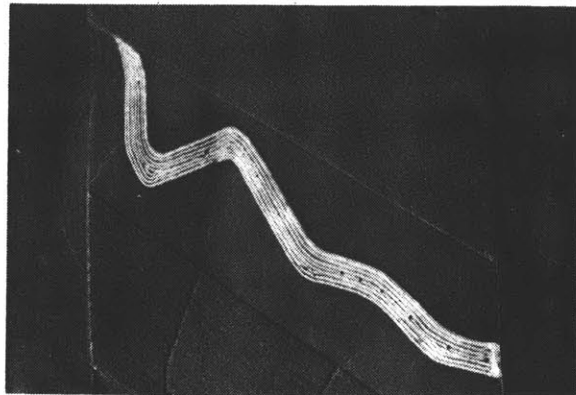
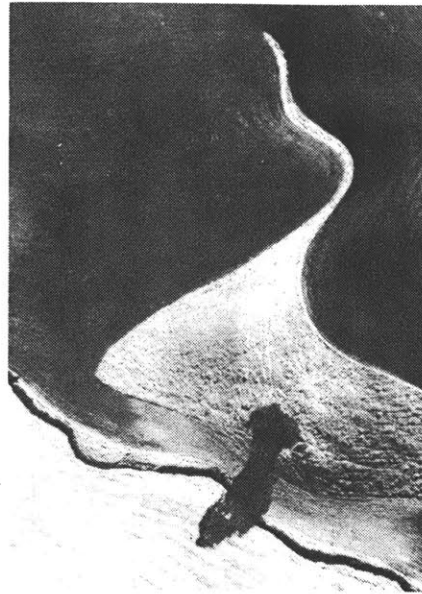
SITE

The hills and ridge tops are left unfarmed, and surface above the striped agricultural land like islands. The vineyards, growing mostly on south and east facing slopes, follow and emphasize the movement of the land, and surround the island landmarks that punctuate the site. Thick trees move up from the valleys, following the drainages, soaking up water and preventing erosion. There are chasms and steep areas not appropriate for either roads or vines that are left untouched. The roads themselves are a further emphasis of the landscape movement, keeping high and out of the valleys. The building complex is concentrated in the central part of the site, in a loosely defined basin. It is a tranquil place relative to the agitation of the site around it. It is self contained; a sort of natural "plaza" which is north facing, roughly circular in form, with a lake at its lowest point. The edges of the "plaza" are reinforced by pedestrian pathways and

parking, and by the winery itself, which forms a major wall.

The strength of the directionality of the landscape is somewhat obscured in this part of the site. As a response I juxtapose the static qualities of the "plaza" with building elements that are strongly directional, moving in the dominant direction of the landscape. Some of these elements break past the containing edges of the "plaza" in order to connect this area with the dynamic quality of the larger site.





*facing page: movement and form study:
vines, roads, valleys, and knolls*



1" = 250'



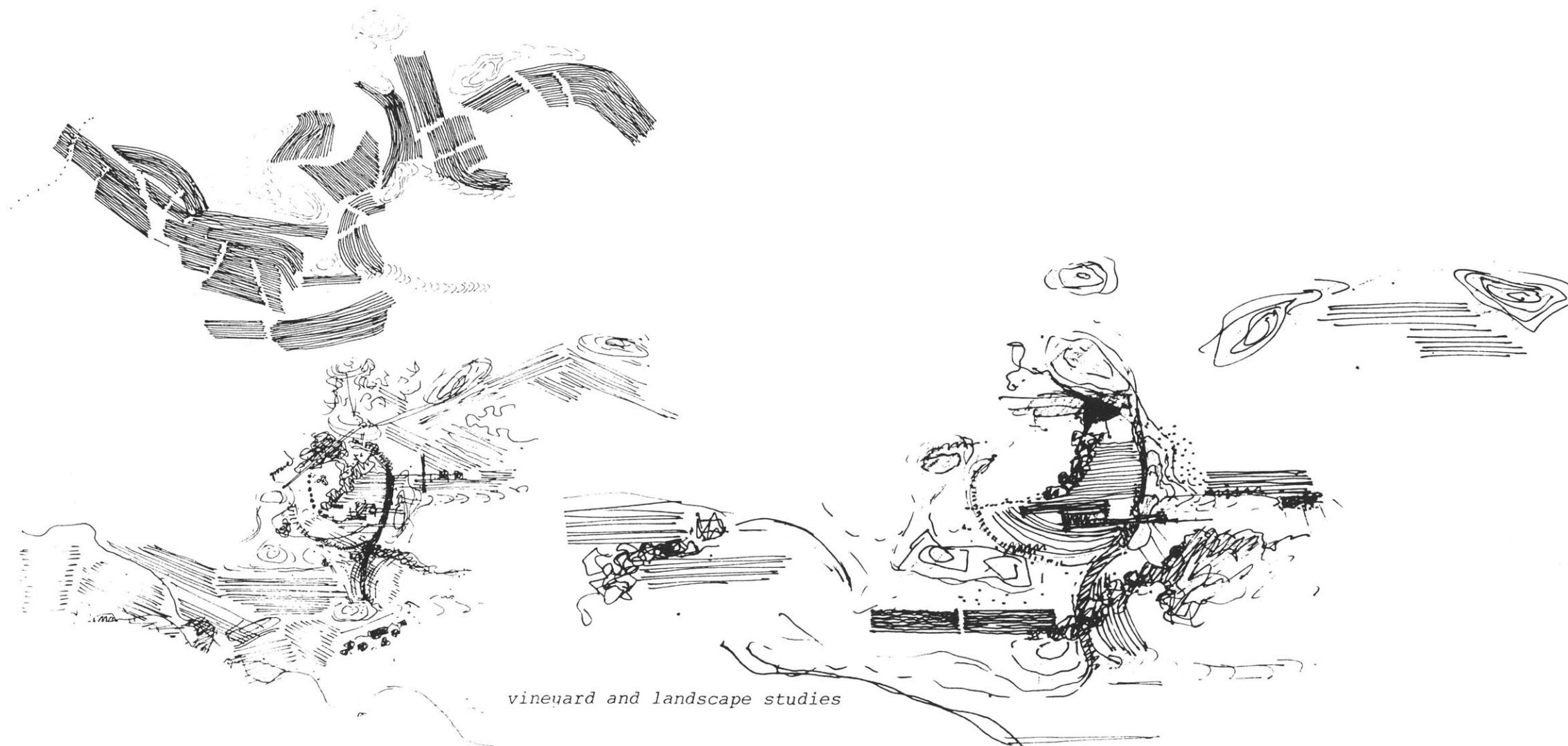


drainage, landform, steep hillsides, vineyards
[Anduse] 1" = 300'



facing page: drainages and valleys,
topography and vegetation
N
1" = 400'

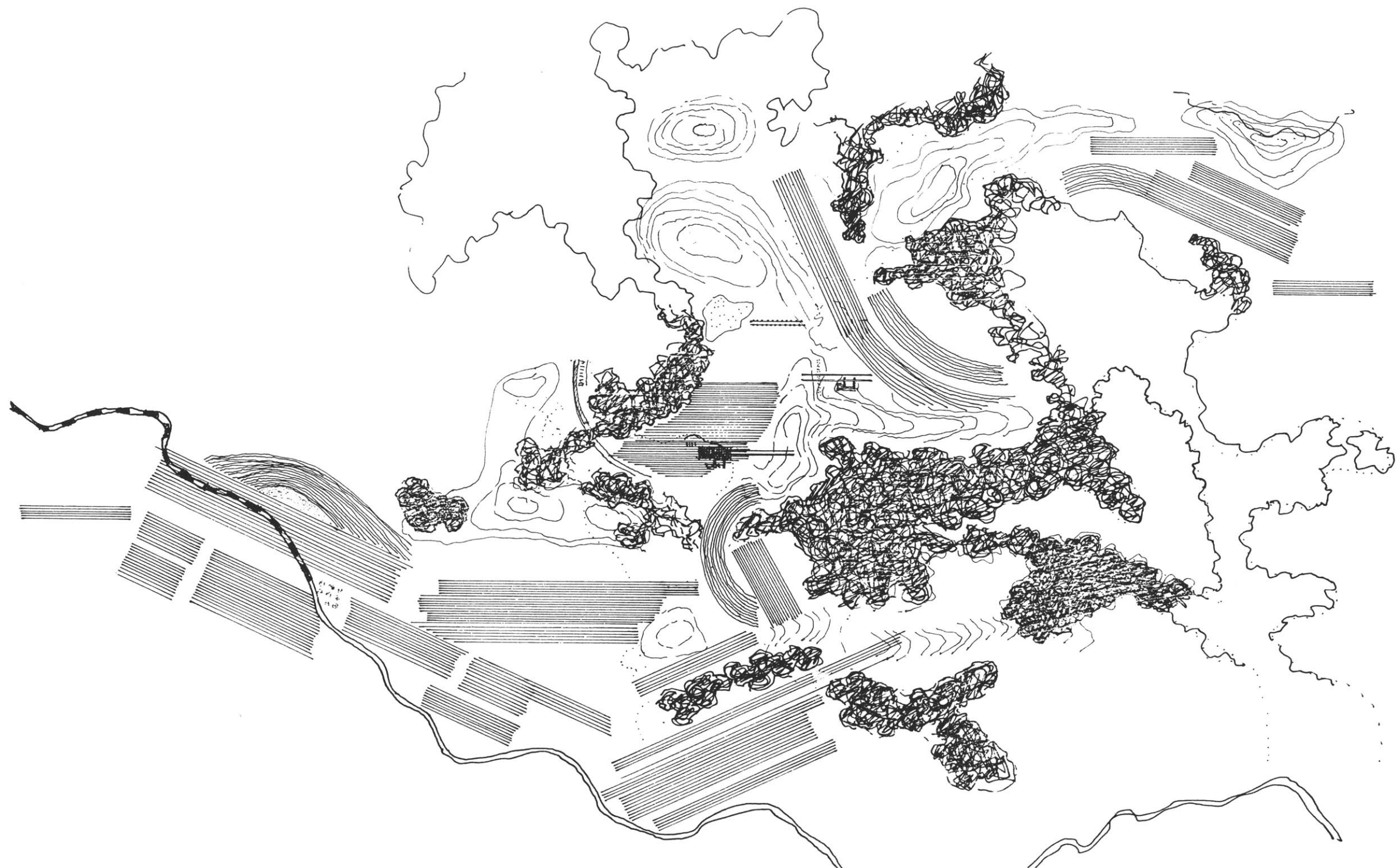


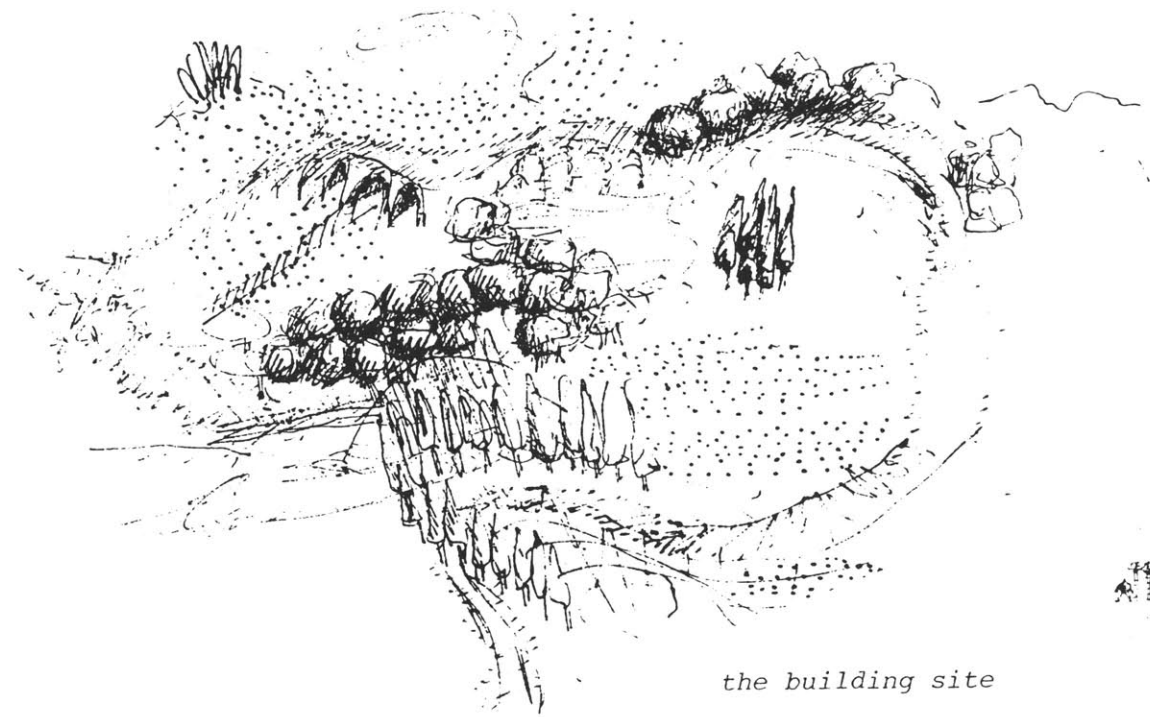


vineyard and landscape studies

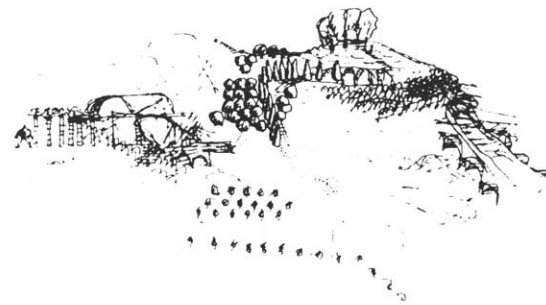
facing page: 1" = 400'

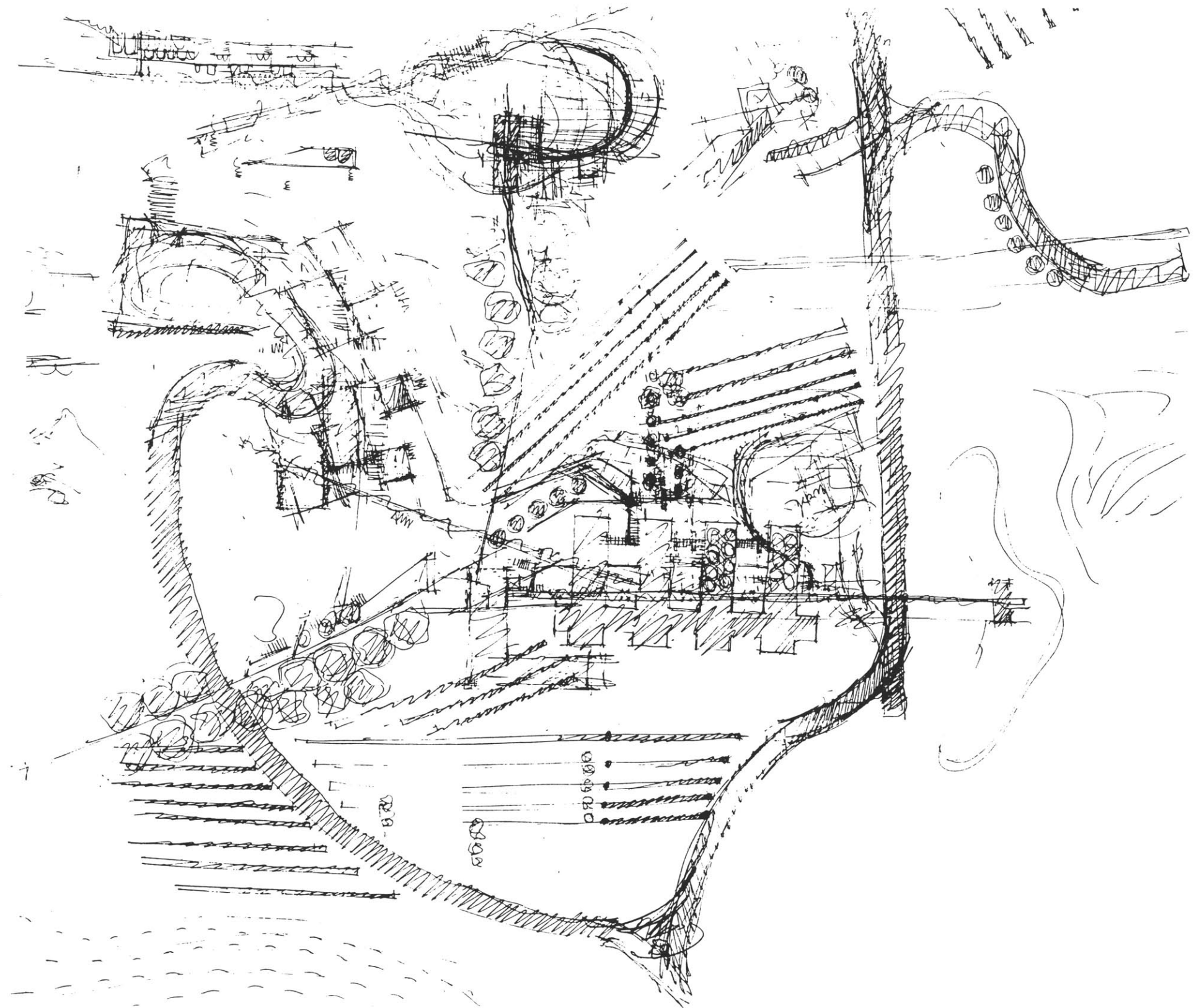






the building site



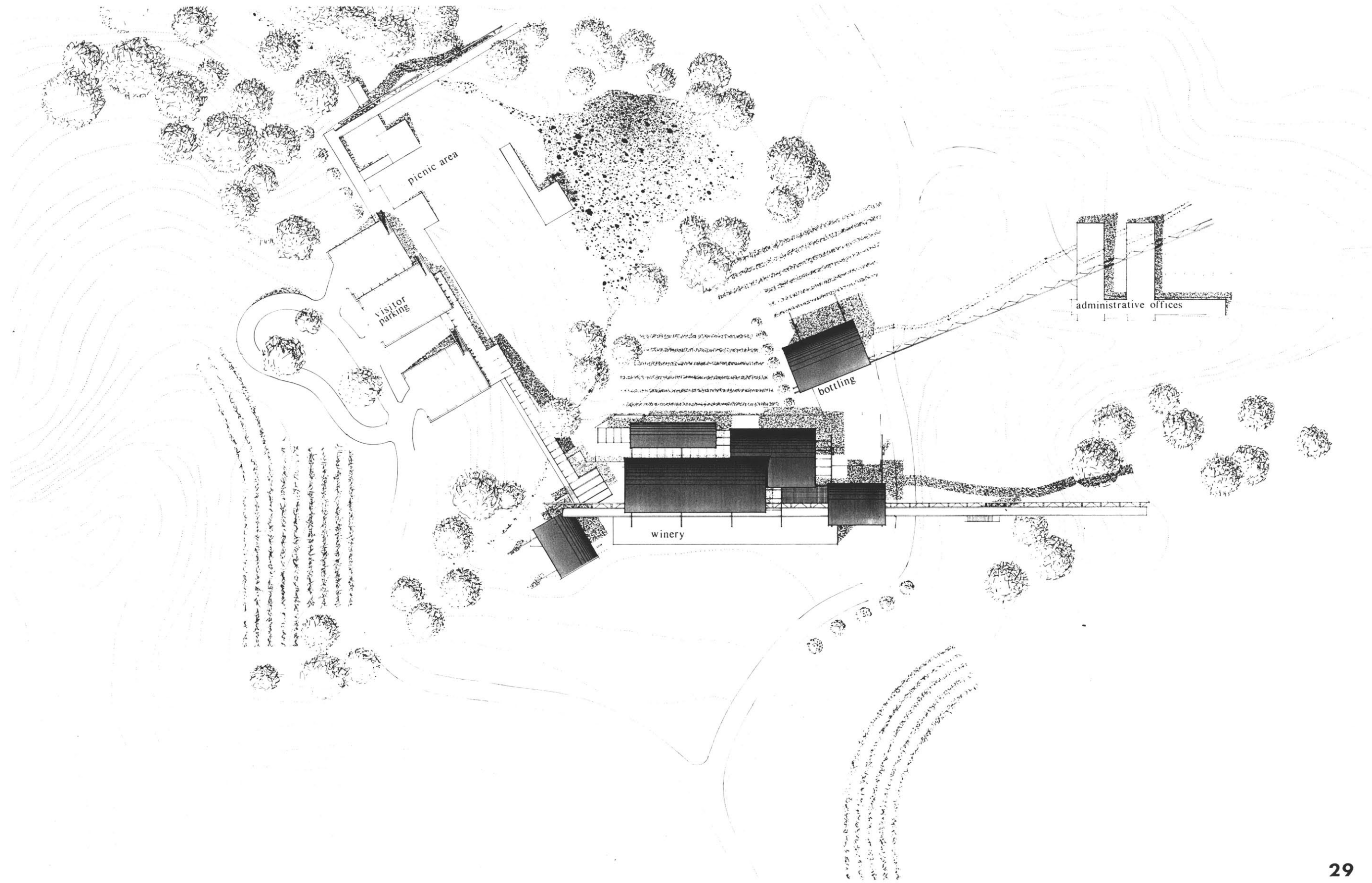


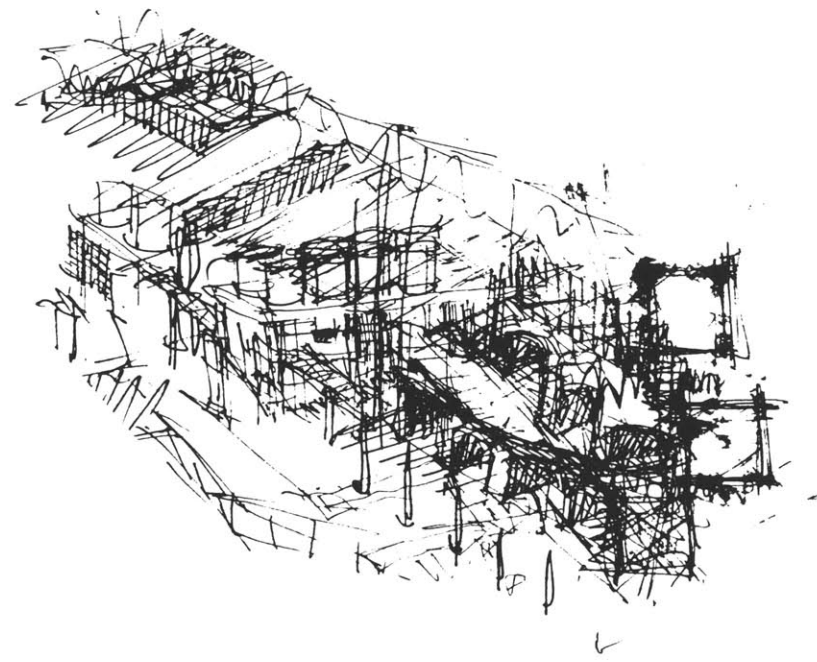
N early site plan



facing page:
SITE PLAN







BUILDING

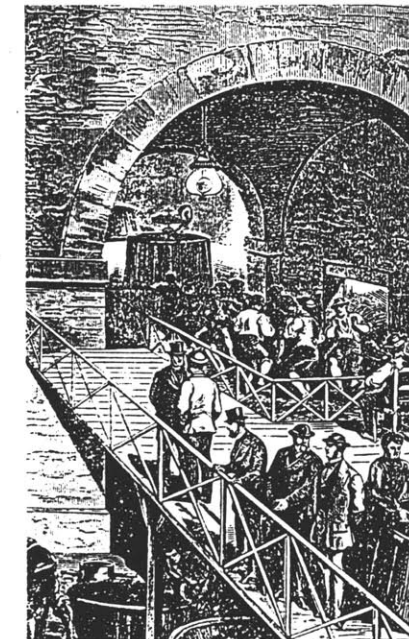
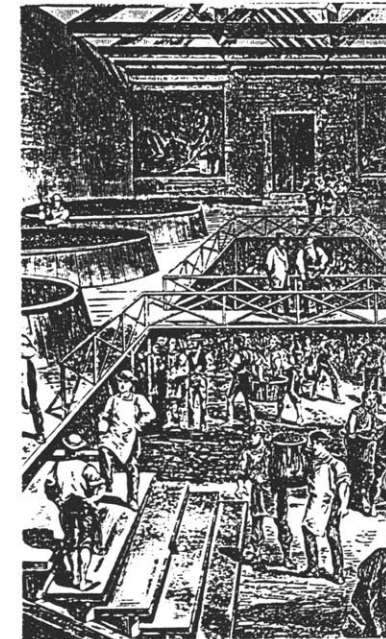
The winery is situated on a slope, and immediately to the winery's back is flat ground. The main working platform of the winery is at the level of the flat area of ground. The platforms extend out and over the falling slope and are supported at their ends by heavy masonry walls that rise twenty-five feet to meet them. This main level accommodates the fermenting and processing stages of wine production. The twenty-four foot wide platforms are sized for two rows of large fermenting tanks and a servicing aisle between them. This area is not enclosed since each tank wears a refrigerating jacket and interior temperatures need not be regulated. The area is roofed however. Each tank can be accessed from the ground, and a system of catwalks provides access to the tops. Wine is distributed throughout the winery through pipes, and these are usually located within proximity of the catwalks. The platforms are sixty feet long and span a length of forty five feet.

An attempt is made to connect the visitor's experience to the landscape and vineyards as well as to the working facility of the winery. Those areas of the site left natural are accessible to the public for walking

and picnics, and promenades draw the public through the winery and to the site beyond.

Tourists have two ways to move through the winery. They can walk underneath the platforms that carry the fermenting tanks, and so have views of the tanks overhead and cellars to their side. From this level they can also observe the activities inside the laboratory and production tasting rooms. The public can also watch the wine making areas from above by walking along a sort of flying promenade: a series of trusses that serve as path, roof structure and bridge. From this vantage point the visitor can observe the tank room and the activities at the grape receiving/crushing areas which are congested and hectic during harvest season. This "promenade" can be followed over the winery road and out to the edge of the site from where the pedestrian can walk to the far tasting rooms located along the ridge.

The wine tasting area is the center of the tourist realm. Tasting rooms are located in the cellars, and outdoor patio spaces are provided for public use. Both routes through the winery are accessible from this area.

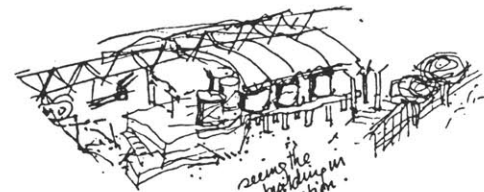
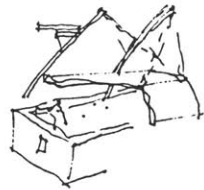


Friday 10.17

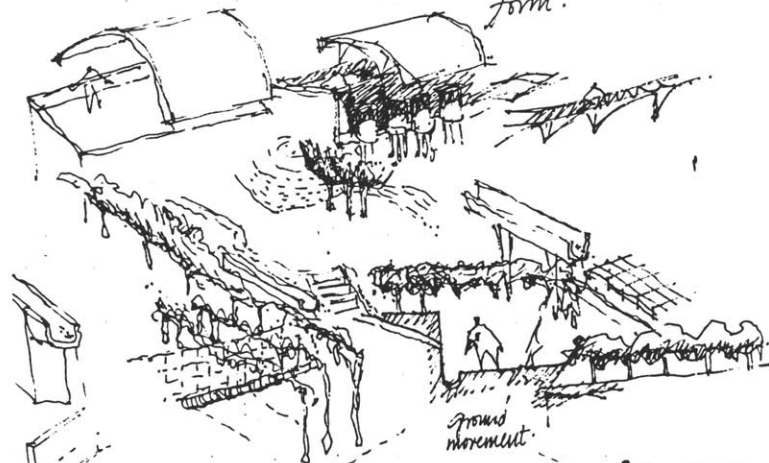
the "system" of public walkways through the site & the building is a predominant theme - and form - giver to the project.

the other predominant element is the roof, free (often) of the building or walls. A "namada" that shades people and wine tanks. This roof form is not flat.

and then there's the cave: the subterranean storage and aging ~~the~~ which meets the air in a developed, free standing form: from subtracted space to built form.



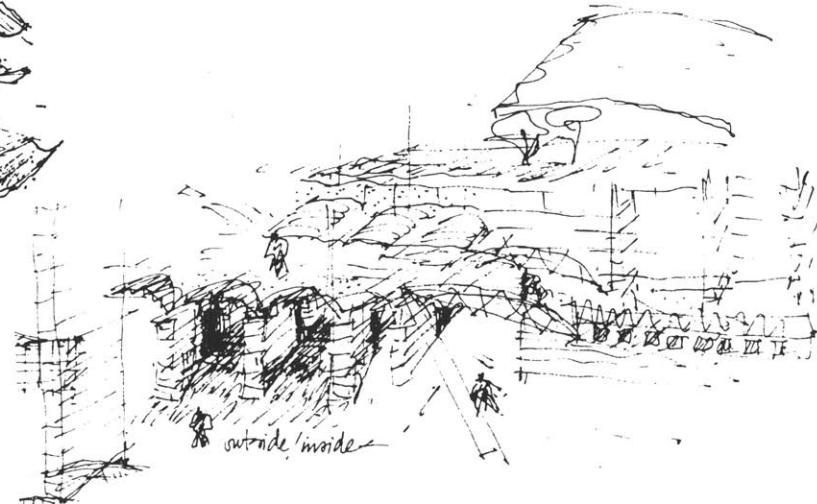
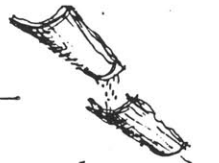
very open airy verandah roofed landscape. seeing the building in section.



ground movement

circulation dimension

structural member dimension

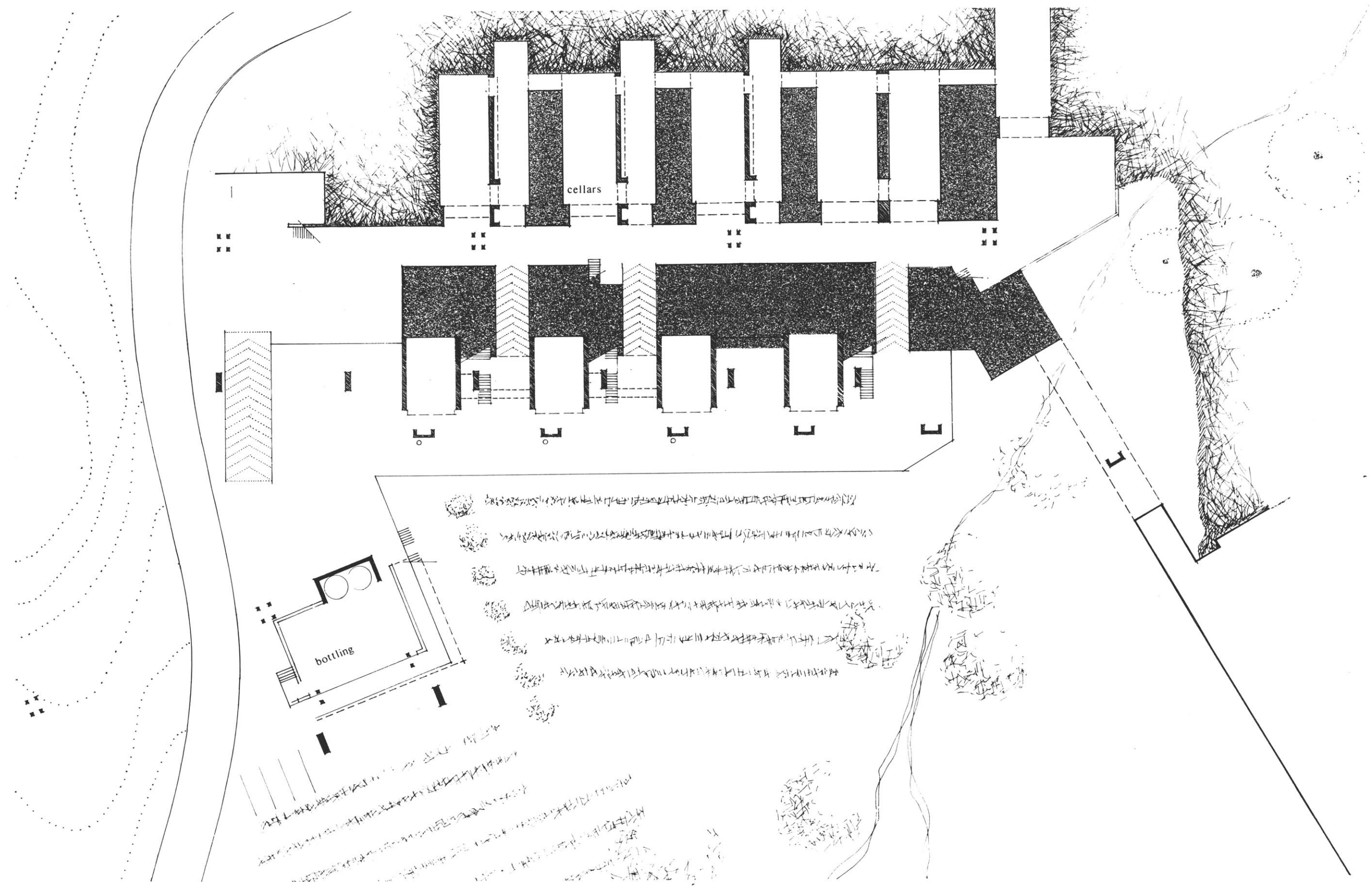


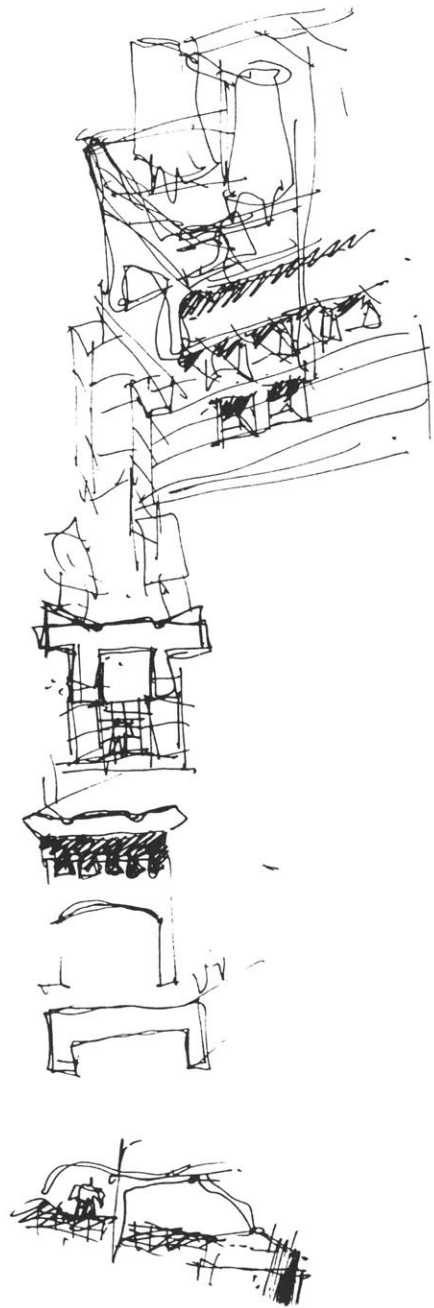
outside inside


facing page: PLAN 1

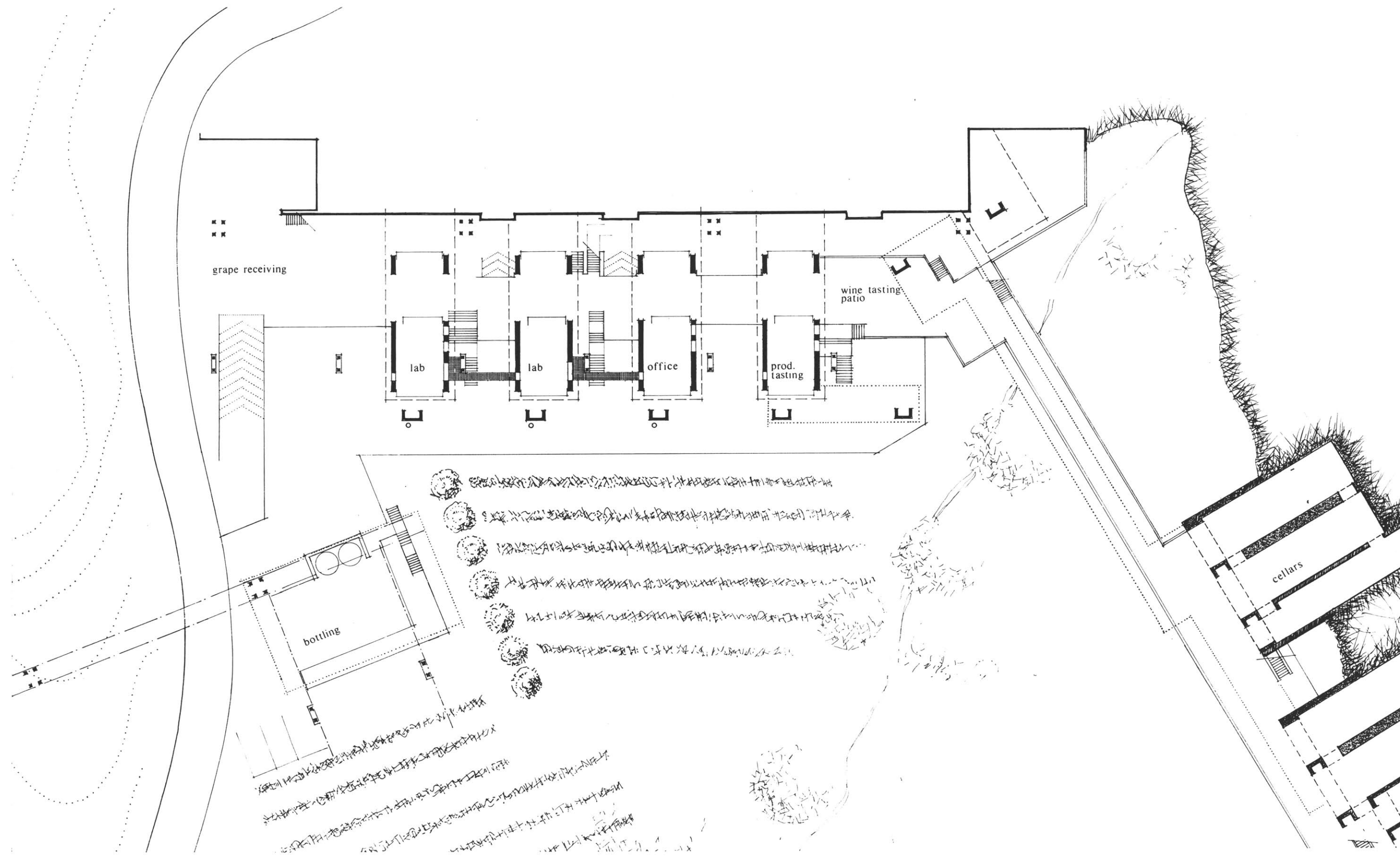
1" = 40'

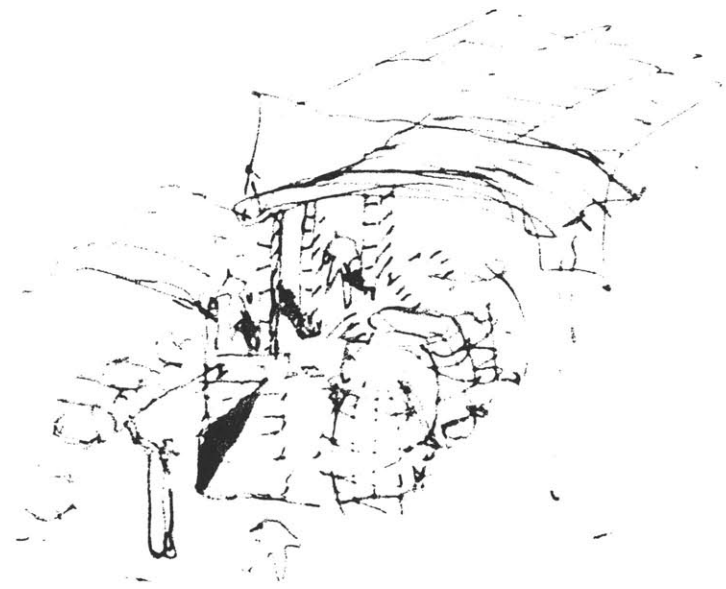






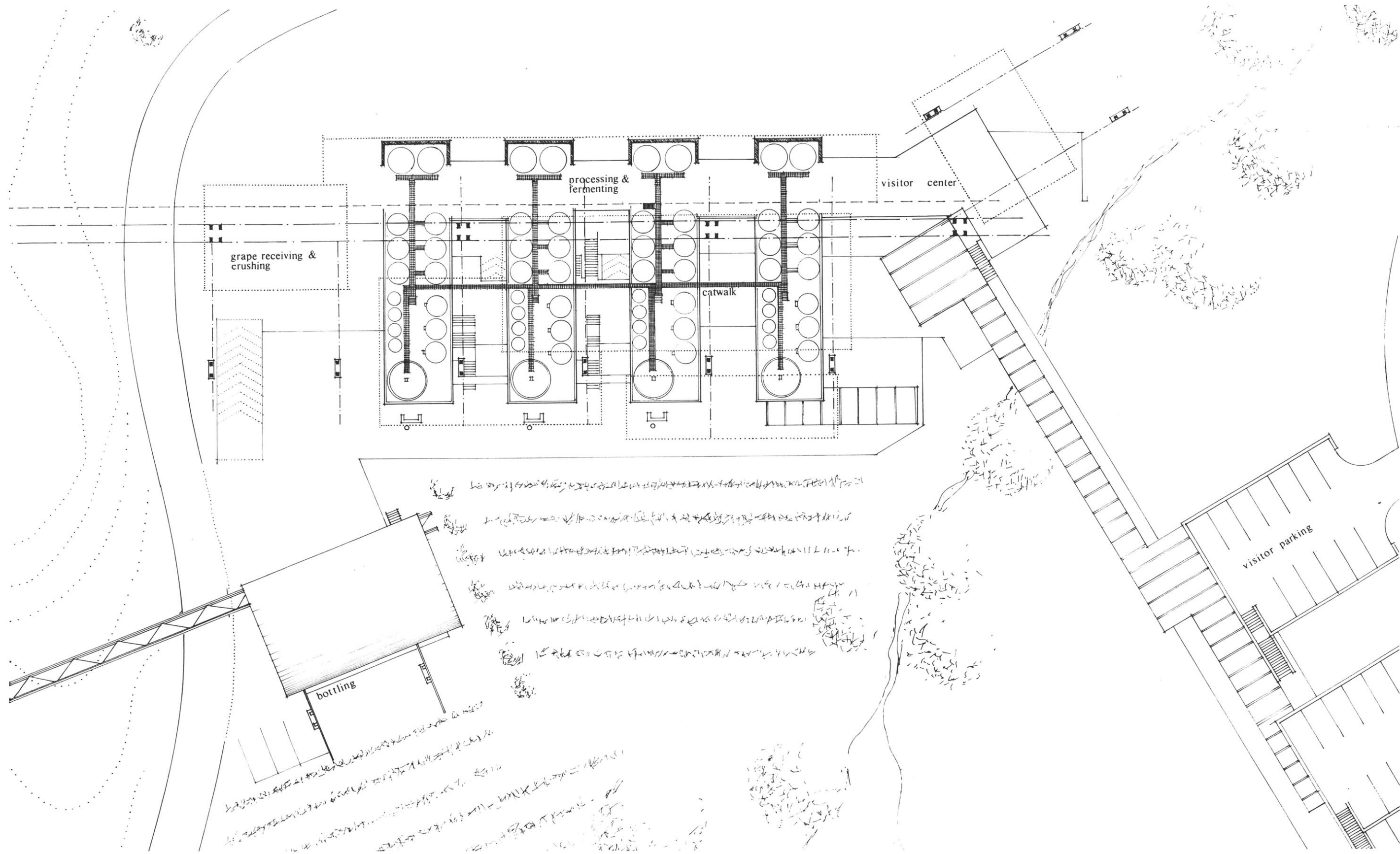
facing page: PLAN 2
1" = 40' 

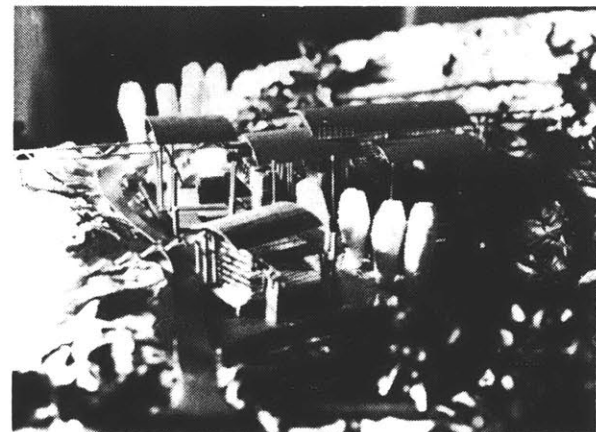
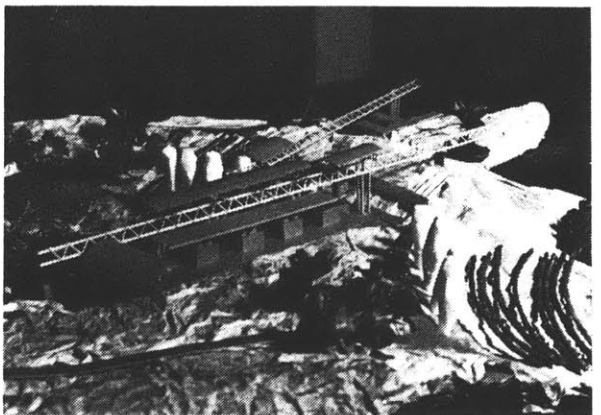
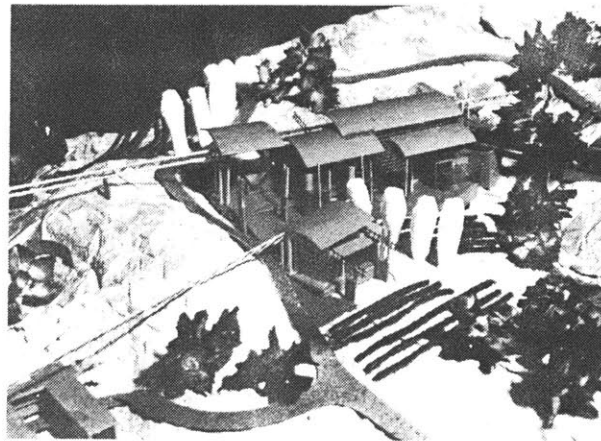
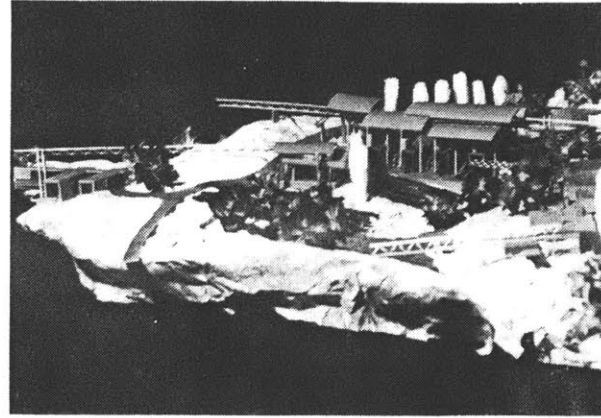




facing page: PLAN 3
1" = 40'

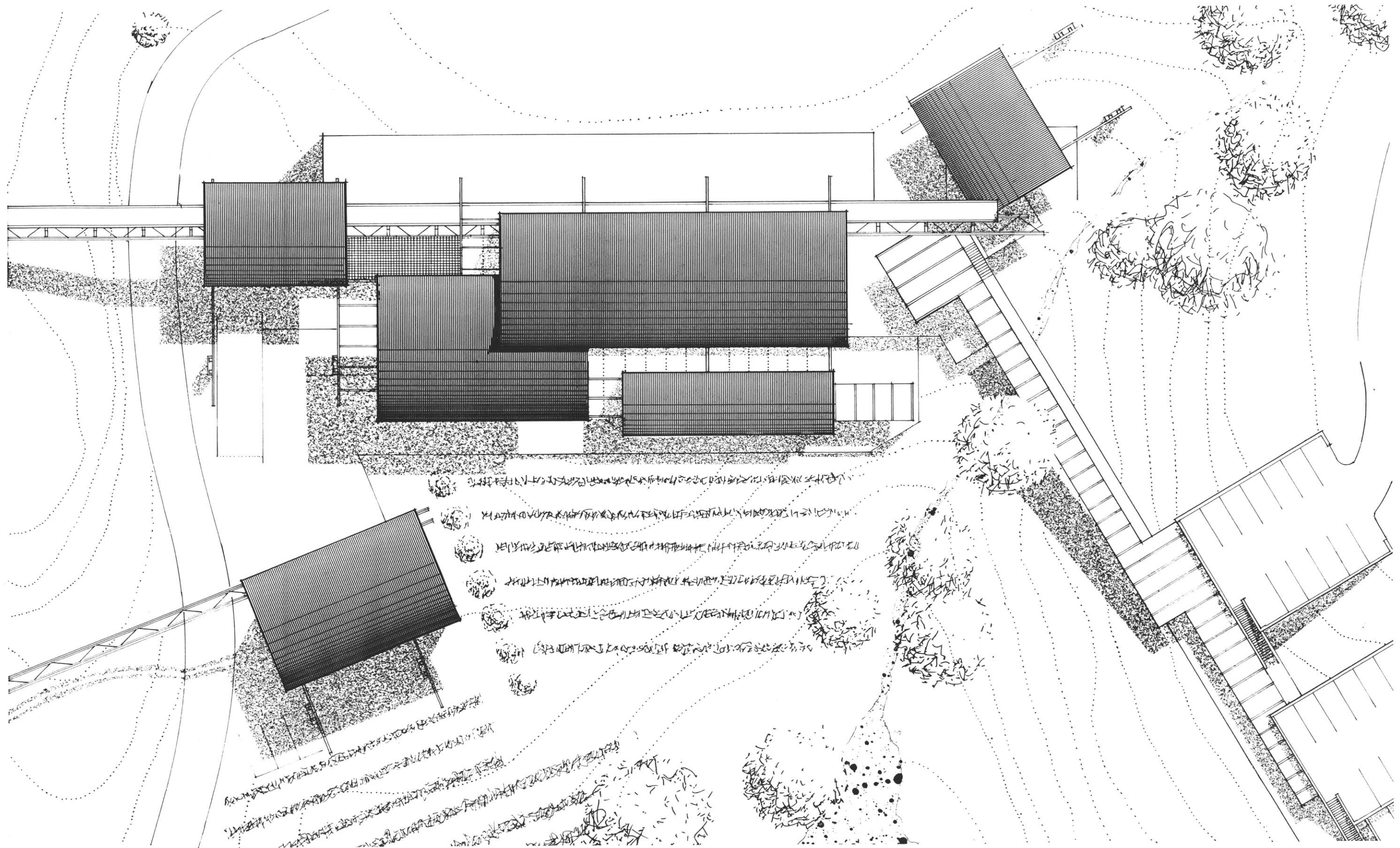


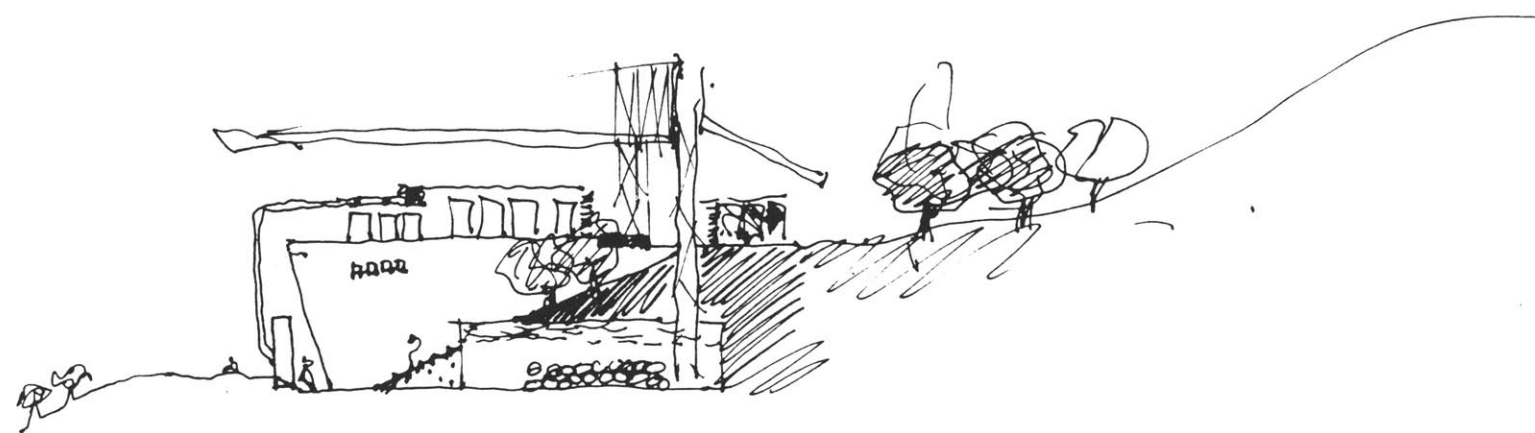


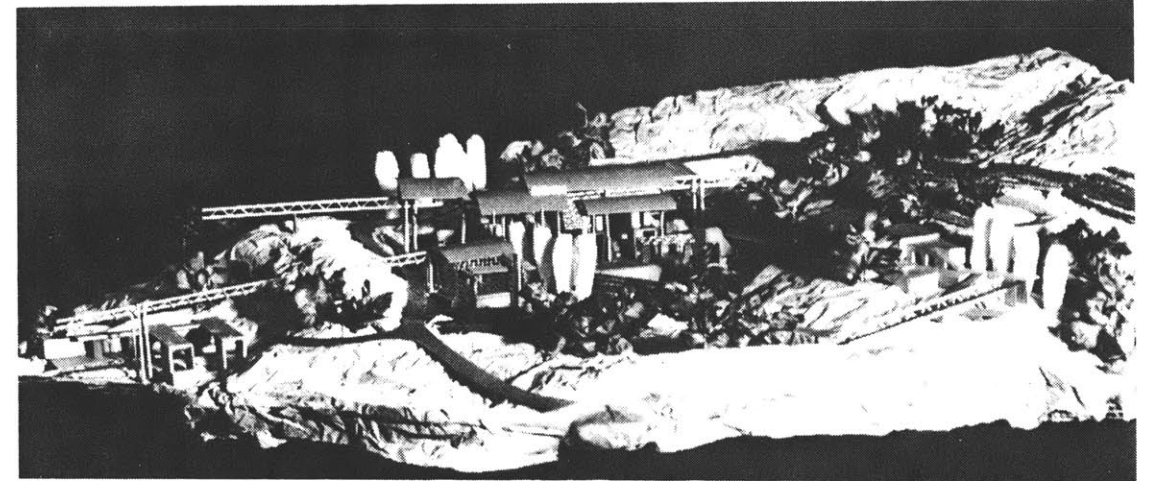
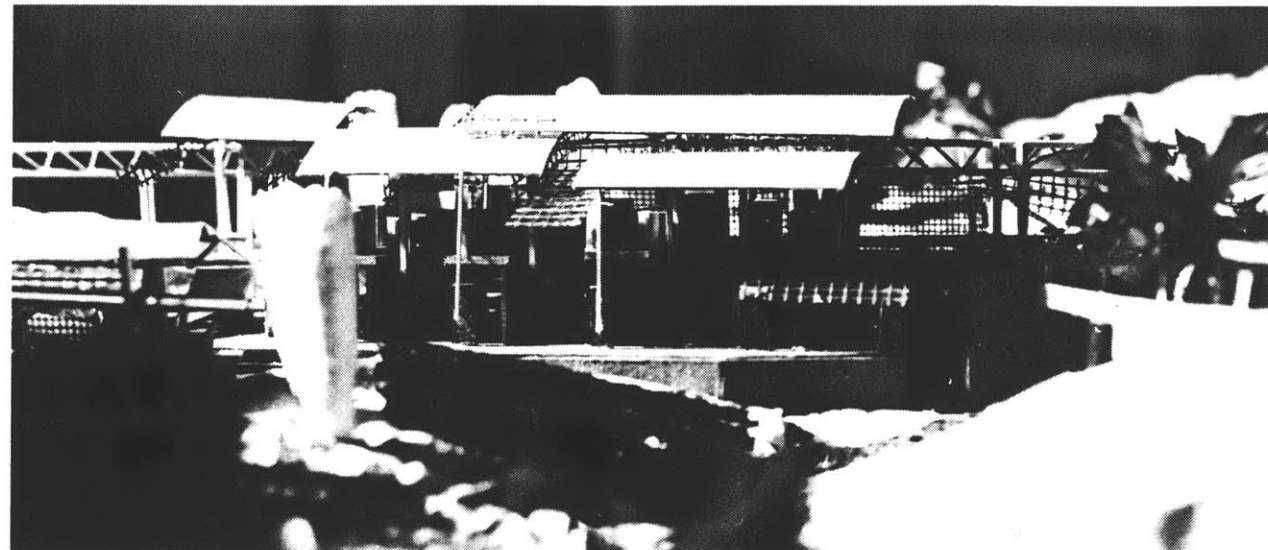
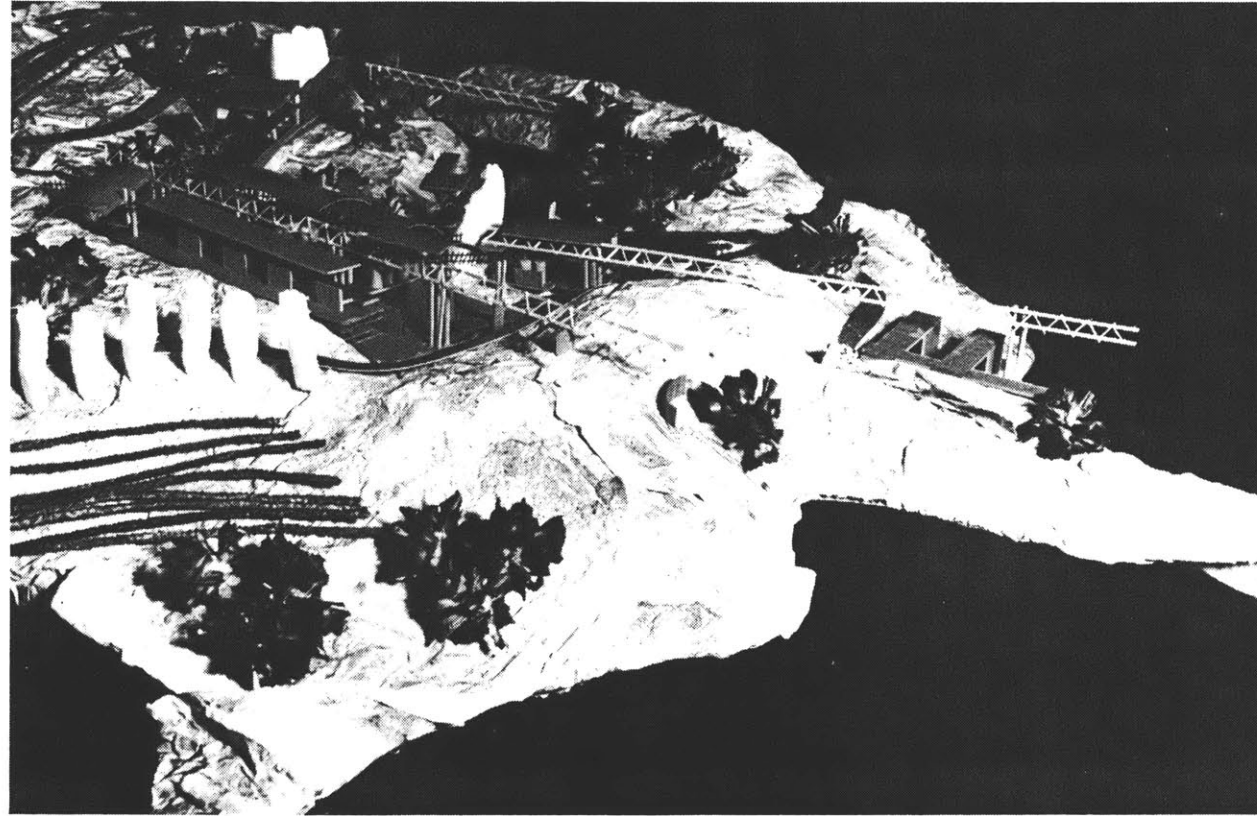


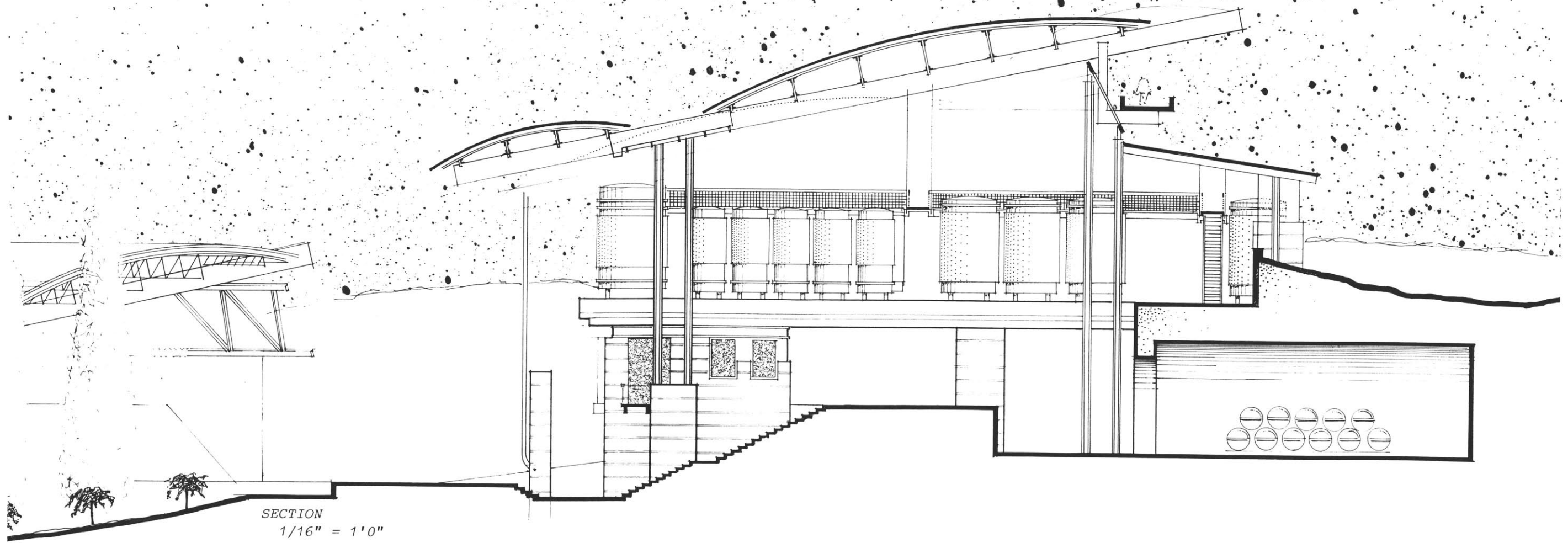
facing page: PLAN 4
1" = 40'



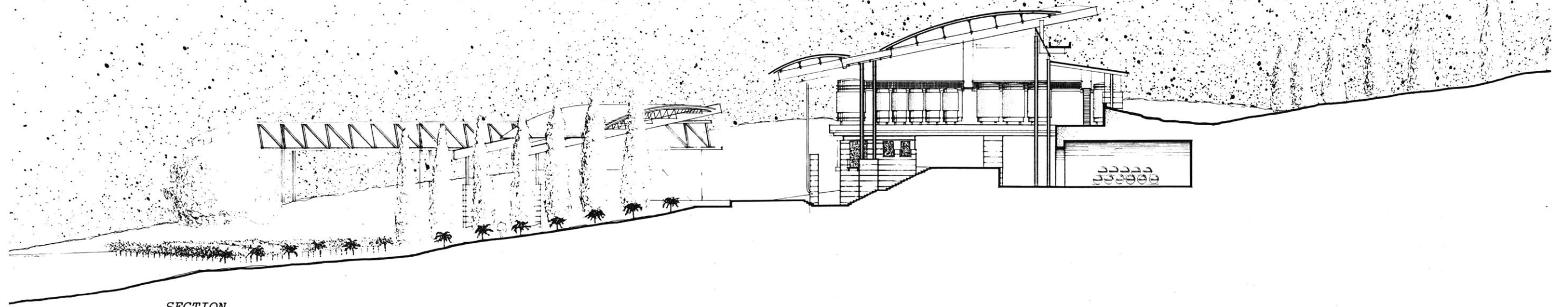




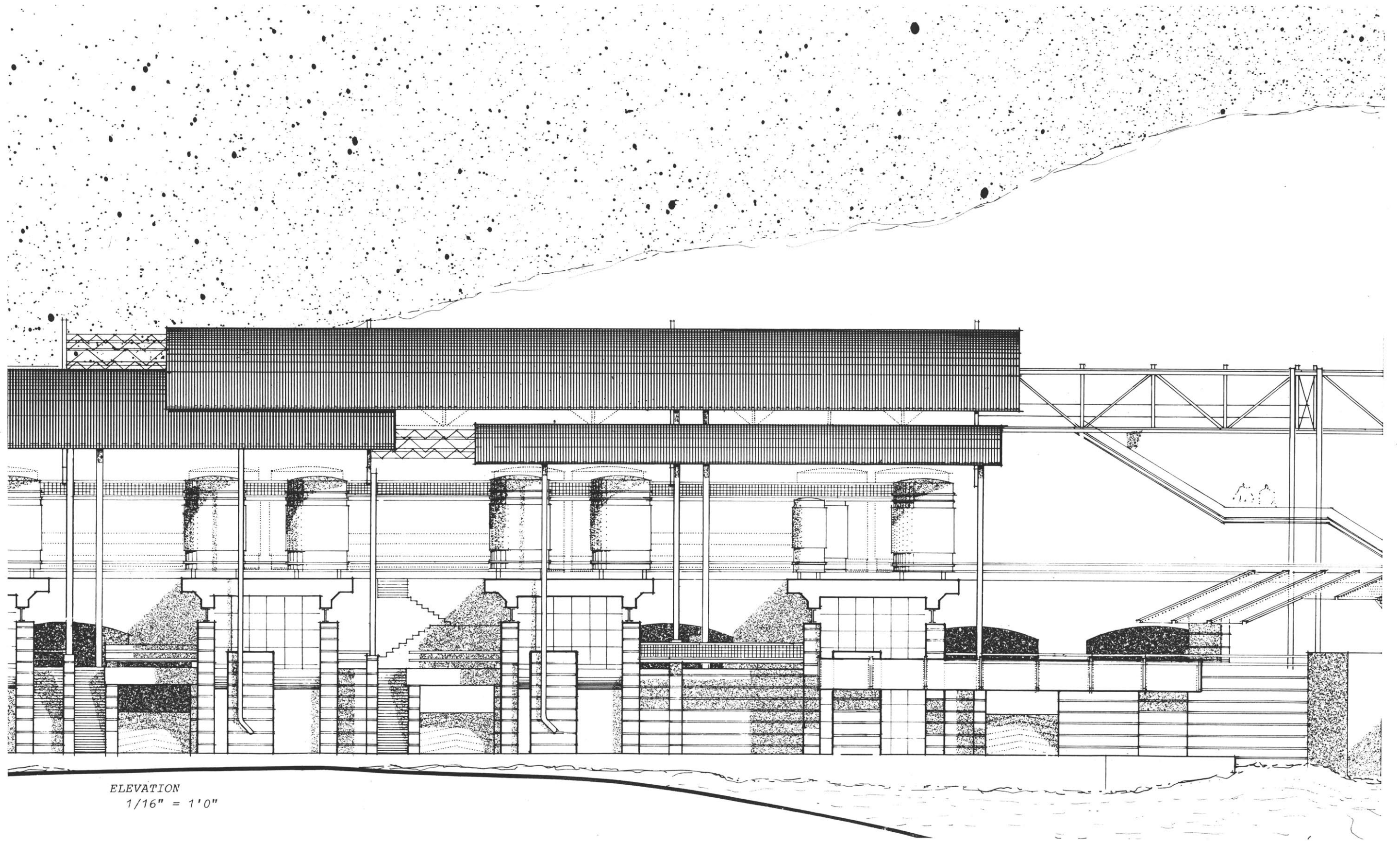




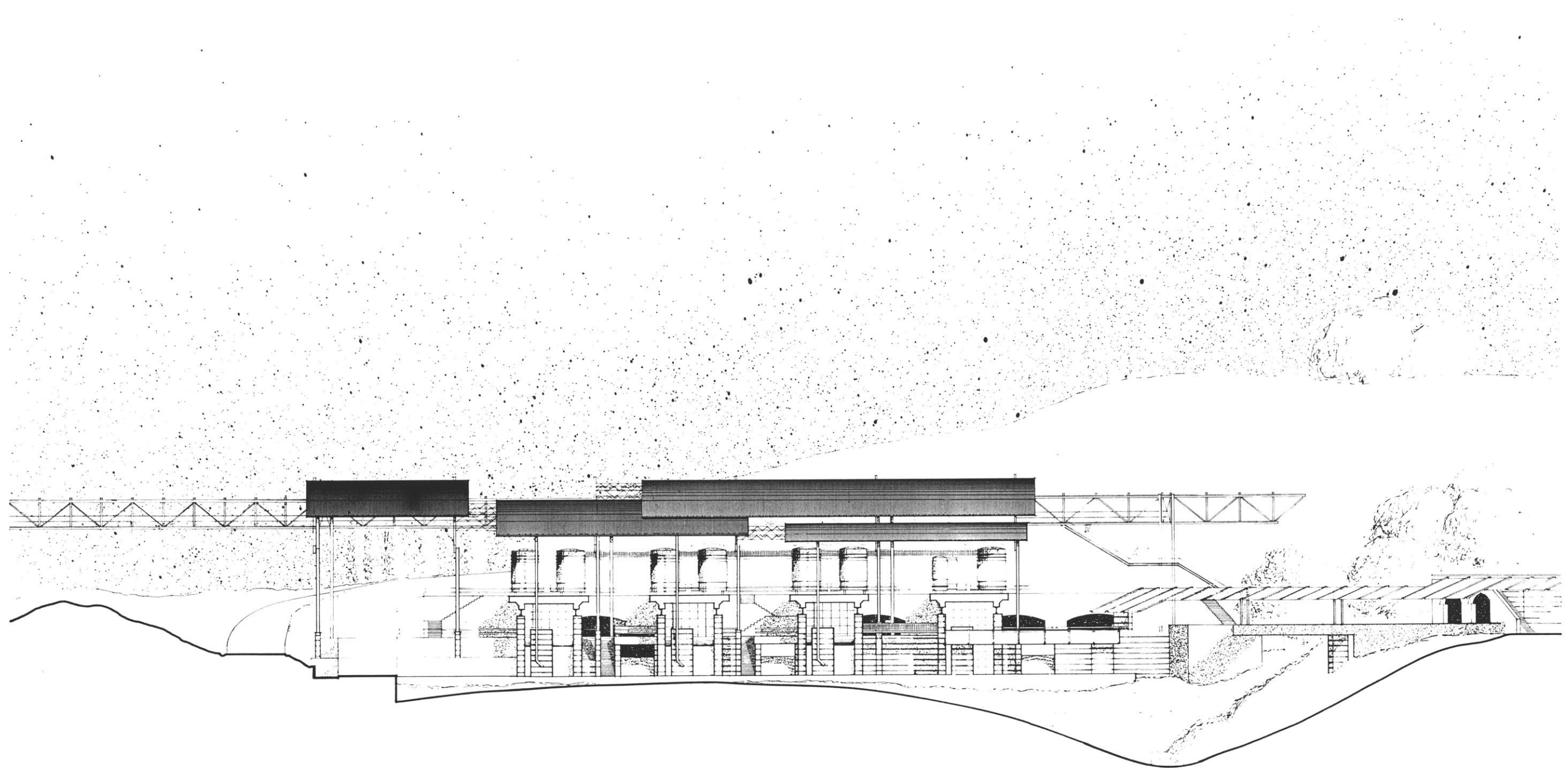
SECTION
1/16" = 1'0"



SECTION

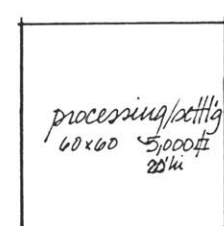
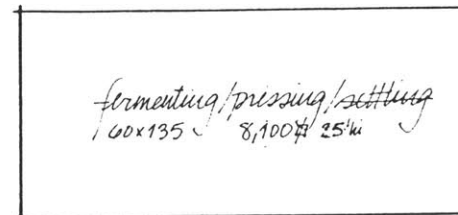
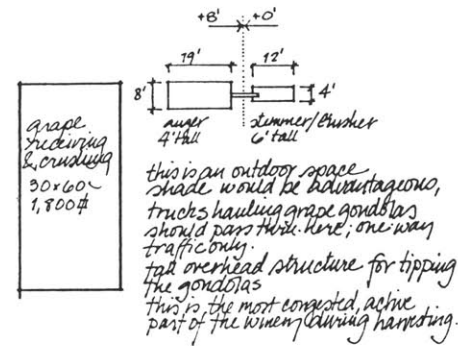
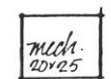
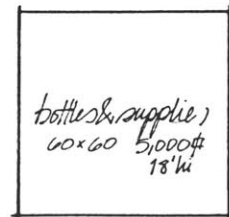
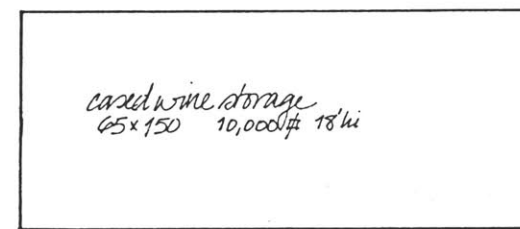
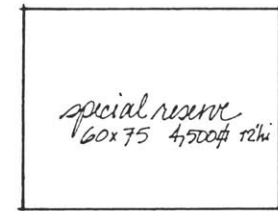
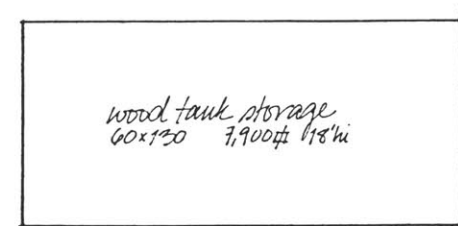
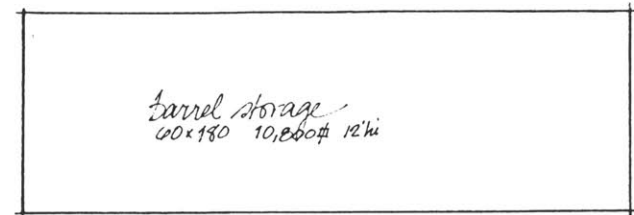


ELEVATION
1/16" = 1'0"

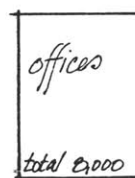
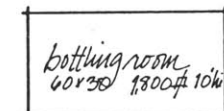
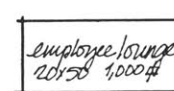


ELEVATION

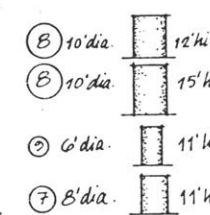
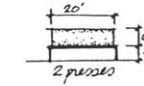
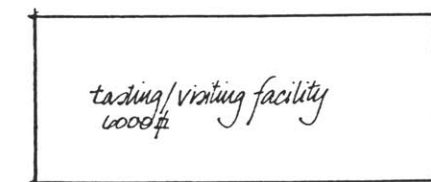
PROGRAM



the lab should have substantial northern light



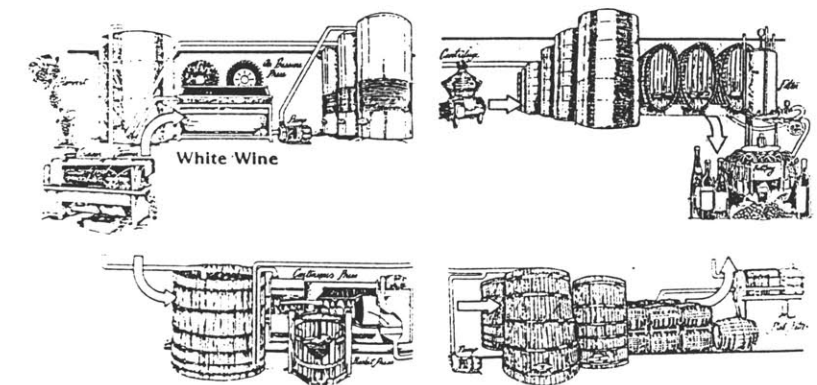
total 2,000



ceilings need to accommodate airlocks over the tanks (an additional 8 ft)
tanks are jacketed, so the room need not be cooled
tanks are placed on a raised, sloped floor and the floor slopes to gutters



this room has in it: pumps, filters, barrel washing station, centrifuges



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