

A STUDY IN CONTEXTUALISM

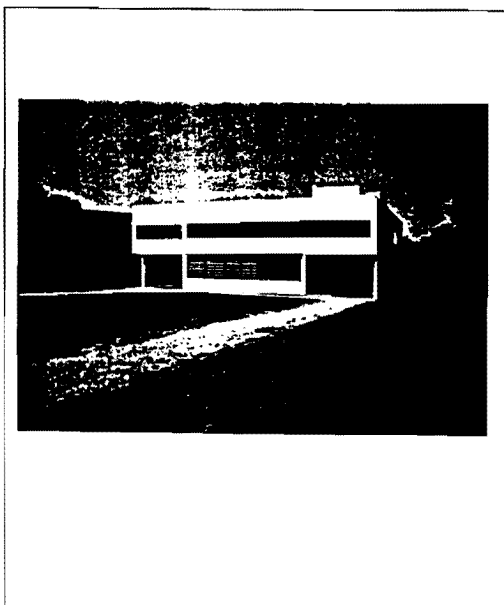
SENIOR HONORS PROJECT

JUDITH C. SPARKS

7 MAY 1996

Humans need to feel that they belong in a place. We need to have a connection--some would say a communion--with our surroundings. In the built environment, we often sacrifice this greater sense of integration with a *space* for the false security of *place* identification. Only recently have architects discovered or at least come to understand and address this psychological need. Both in function and formation, our buildings are affected by their surroundings, be they natural or urban. Architecture must address this issue, even if by simply deciding *not* to address it.

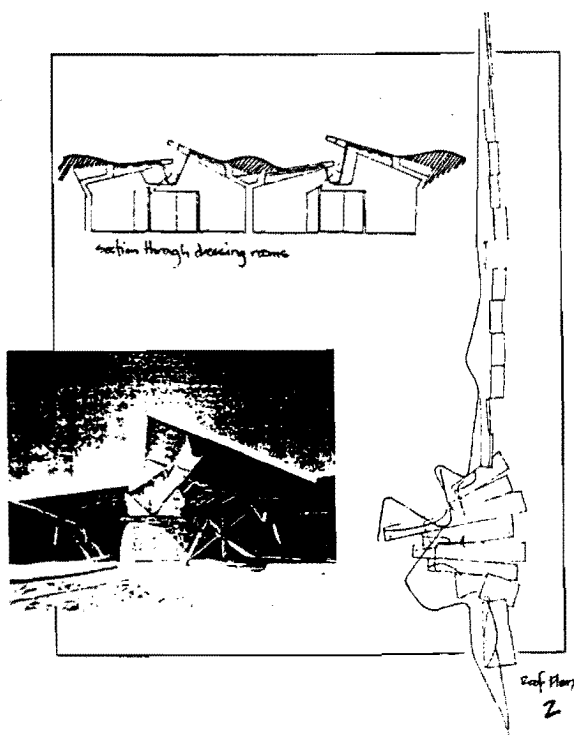
Modernists attempted to remove themselves from the issue by separating their buildings from the land. A white box in a green field, Villa Savoye (1), Le Corbusier, rests on pilotis and seems to sit *on* the ground, rather than *in* it. The extreme reaction to this, what is commonly referred to as "organic" architecture, mimics nature and the natural, until the building is indistinguishable from its surroundings. Again, we have not established an identifiable link with the landscape, this time because we have entirely merged with it. What is needed is an architecture that is distinctly human but directly responsive to nature--much like a flower or a tree that is a distinct entity but is defined only in the context of the whole and cannot exist without this whole. Or, to draw



another analogy from nature, consider a rock outcropping on the side of a hill: without the soil beneath it, the rocks would fall, but without the rock beneath the soil, the earth would not stay in place.

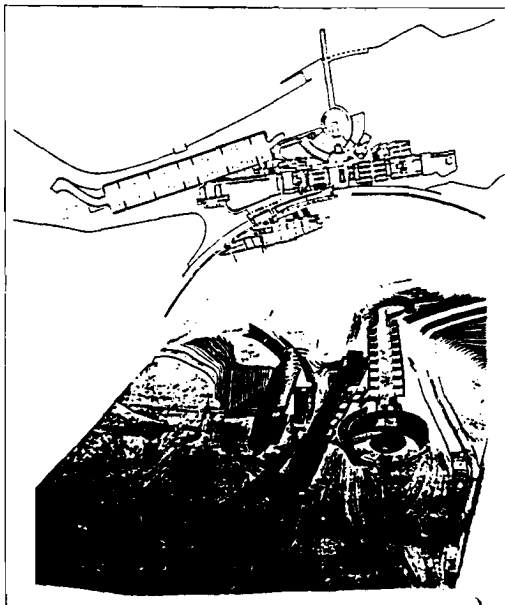
Like the flower or tree, a building must also maintain a *symbiotic*, rather than parasitic, relationship with its surroundings. The way it affects the environment, both locally and universally, determines the degree to which it is truly compatible with its environment. There should be an exchange of elements, with both the building and the environment contributing to the functions of the whole ecological system. This begins at the site analysis phase, during which the architect must come to understand, not just recognize what is taking place both tectonically and organically at the site. Perhaps the building should "breathe": taking elements out of the air, but returning others to it. Or perhaps it should rest on piles rather than on a continuous foundation so that drainage will continue to occur beneath it.

At this point, we have established two approaches to what is fundamentally one issue: site responsiveness in terms of so-called "contextualism" (the buildings form relates to what is around it) and in terms of "sustainability" (the buildings systems are responsive



to the surrounding systems). But there is a step beyond these: the step in which the facility becomes simply another eco-system in the existing environment of the park. At this point, the building begins to generate a *phenomenological sense of belonging* that supersedes both form and function.

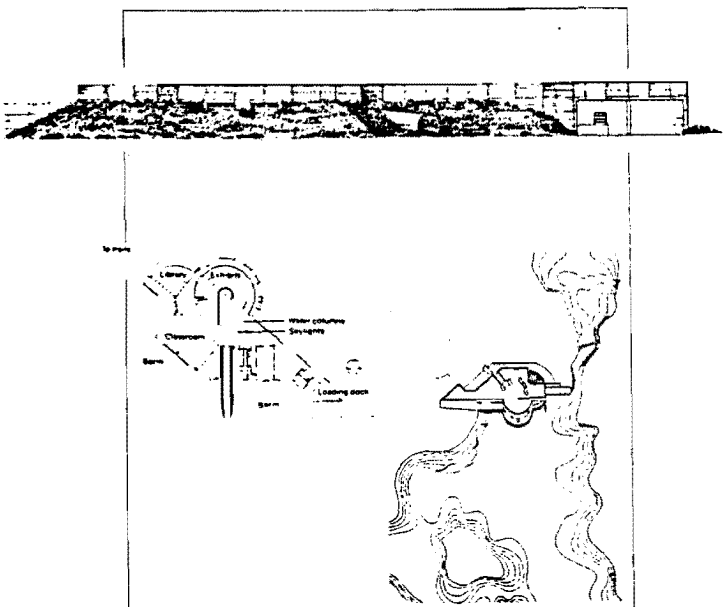
Certainly, no one would argue that Miralles Pinos' Archery Facility (2) disappears into its surroundings, and yet the distinction between built and natural forms is ambiguous. The same is true, to less of an extreme, of Morphosis' Chiba Golf Range in Japan (3). The architecture becomes an *integrated* part of the landscape, and not only on the surface. The forms do respond well to the landscape, but the systems also smoothly connect to their environment. In design, Morphosis develops a "strategy that links the site investigation to a coherent and responsive architectural language." Antoine Predock has a similar design philosophy which he states, "Rather than transform the site, I want to make the [building] an extension of its surroundings. It's a seamless event between land and design." His Rio Grande Nature Center (4) binds itself to the land in such a way that it seems necessary to the perpetuation of the ecosystem, like a dam holds a lake and directs a river.



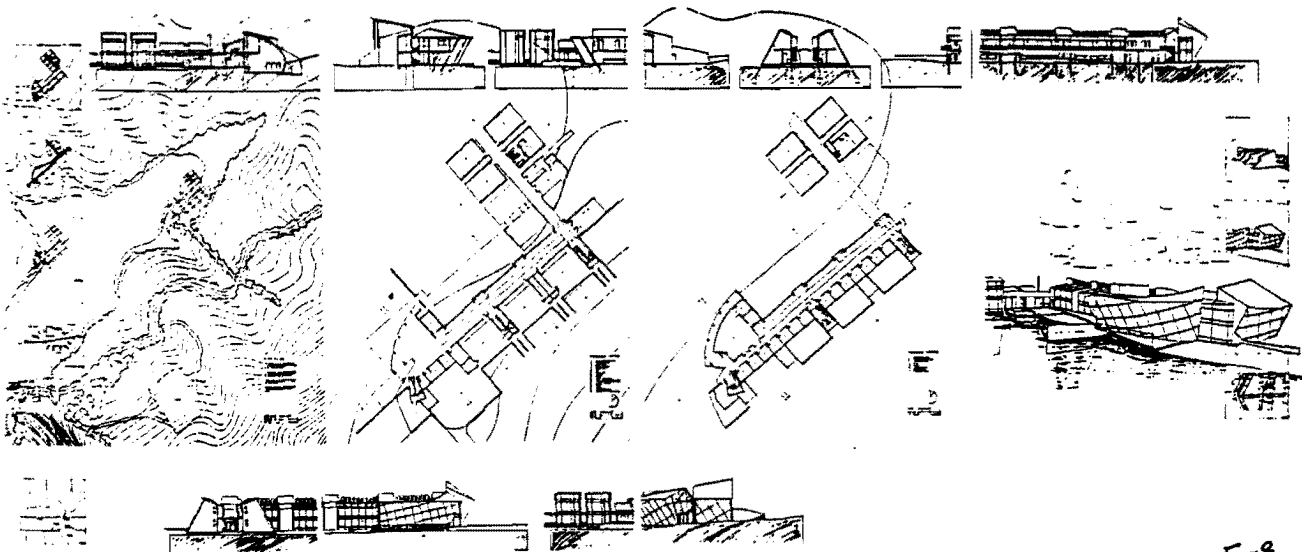
There are many other approaches to contextualism, the breadth of which could not even be assumed in this paper: critical regionalism (Kenneth Frampton), alternative contextualism (Frank Gehry's recent work), social influences, or any urban contextual issues. However, overall, it seems necessary, if we are to feel that intrinsic connection to our surroundings, that architects come to better understand how what they build joins itself to what is already there (physically, historically, and socially), and how what they *destruct* is replaced by what they *construct*.

Like the aforementioned projects, it was not my intent to create a *stylistically* integrated building (5-8). The structure is what it needs to be, and the forms are expressive of the functions they house. Architectural honesty, or tectonic architecture, as some would say, finds its origin in nature: the shape and veins of a leaf, the branches of a tree. The leaf cannot *be* anything other than that for which it was designed. This building is not a leaf; it is not an outcropping of rocks; it is not a bird in flight. It is an environmental research laboratory. It functions as such and expresses itself as such.

However, the building does not exist independently of its surroundings. To do so would contradict its social purpose of understanding the natural environment. Its location is



not arbitrary; this is a relatively flat portion of land (compared to the rest of the cove!) and the building is oriented parallel to the contours; these moves should reduce the amount of cut and fill necessary to construct the foundations of the facility, and therefore, intrude on the existing understanding of the landscape only in an orderly, fairly minimal way. Also in relation to siting the building, the atrium, stretching in front of the work spaces, redefines an existing path with enclosure, but not to the point of disorientation. This trail is understood only in relation to the lake, hence "Lakeside Trail," an understanding which is not altered by the building. Visual connections are almost continually maintained, with the exception of ten-foot "regulating" panels set at thirty-foot intervals. Parallel to this atrium are low retaining walls, necessary at the ends of the building to regulate entry/exiting, but also beginning the extension of the building into its surroundings. The concrete walls which dig perpendicularly into the earth and define the "service" spaces (as opposed to the "served" spaces) anchor the building into place, or conversely, initiate the growth of the structure--like roots of a tree. Then the building stretches even out onto the water--at right angles to the shoreline--establishing the presence of the facility in its place from almost any vantage point along the lake's edge, but suspended lightly above the water's surface so as not to impede the flow and currents of the lake. In this way, the lake and ground surfaces are integrated and we



begin to understand their commonalities. The inhabitant should question where the built environment actually starts and where the natural environment is replaced.

Integration of this building into the landscape is not halted at the level of form. Several environmental issues concerning site-responsiveness have also been addressed, the greatest of which is a row of six wind/solar collectors atop the ridge. These towers will be the primary source of energy for the facility and concurrently establish its presence at the city scale. They will be clearly seen, alongside existing radio and television antennas, from many points in the city proper. Biological wastes will be distilled without being transported to a remote treatment plant in the existing treatment area, near the nature center/planetarium. Any utilities that are needed in the building will be supplied via underground cables or pipes so as not to permanently alter any natural habitats within the park. Additionally, low-E glass is to be specified for window walls in the atrium, reception area, and housing units. Foundations are not continuous, but rather piles or short-span retaining walls. This should reduce the impact of the facility on subterranean life and be less inhibitive to the natural drainage patterns of the site and surrounding areas.

In this project, I have attempted to formulate a greater understanding of the built environment's relationship to the natural environment. It was my intention that the building attain that "phenomenological sense of belonging" that I struggled to define earlier. Whether this occurred is difficult to determine, but certainly this experimentation has furthered my understanding of the contextual issues faced by many contemporary architects.

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¹ Webster's Ninth New Collegiate Dictionary (Markham, Ontario: Thomas Allen. 1985)

² Bays Mountain Park and Planetarium. informational pamphlet: 1990.

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¹ National Weather Service, "Local Climatological Data Annual Summary for 1993," Blountville, Tennessee.

² Graphic Standards.

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¹ Giuseppe Zambonini, "Notes for a Theory of Making in a Time of Necessity," Perspecta 24 (1987): 14.

² John Pink, "Target Practice," Architectural Review August 1992: 26.

³ Alvar Aalto.

⁴ Antoine Predock, "Antoine Predock," A+U November 1988: 106-7.

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⁷ Michael J. Crosbie, "Hill House," Architecture July 1985: 78-9.

⁸ David Dillion, "Lady Bird's Legacy," Architecture July 1995: 66-75.

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- ⁹ Vernon Mays, "Academy of Steel," Architecture March 1994: 76-81.
- ¹⁰ Richard C. Levene and Fernando Marquez Cecilia, eds., "Enric Miralles/Carme Pinos," El Croquis 49/50 (1991): 32-69.
- ¹¹ Steven Holl, Anchoring (New York: Princeton Architectural. 1991) 58-61.
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- ¹ John Bartlett, Familiar Quotations (Boston: Little Brown. 1980).
- ² Southern Building Code Congress International, Standard Building Code, 1994 Edition. (Birmingham: SBCCI. 1994)

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- ¹ Anthony C. Antoniadou, Architecture and Allied Design (Dubuque: Kendall/Hunt. 1992) 19.
- ² Catherine Slessor, "Above par in Honshu," Architectural Review November 1991: 74.
- ³ Antoine Predock, "Architects Review: The Landscape," Architectural Digest September 1992: 48.

APPENDIX: LABORATORIES

- ¹ Nancy Levinson, "Labs Come of Age," Architectural Record November 1992: 60.
- ² Roger H. Clark and Michael Pause. Analysis of Precedent (Raleigh: North Carolina S U School of Design. 1979) 91.
- ³ Vincent Scully, Louis I. Kahn (New York, George Braziller. 1962) plate 66.
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⁵ Michael J. Crosbie, "Kaleidoscope: Research Center Repeatedly Penetrated by Nature," Architecture December 1984: 68-69.

⁶ Douglas E. Gordon and M. Stephanie Stubbs, "The Performance of Some 1970's Energy Savers," Architecture March 1989: 100-2.

APPENDIX: TECHNOLOGY

¹ Foster Associates: Recent Works (St. Martin's) overleaf.

² Edward Gunts, "Blueprint for a Green Future," Architecture June 1993: 49.

³ Ann C. Sullivan, "Photovoltaics," Architecture July 1995: 109-117.

⁴ Douglas E. Gordon and M. Stephanie Stubbs, "The Performance of Some 1970's Energy Savers," Architecture March 1989: 107-9.

⁵ Edward Gunts, "Blueprint for a Green Future," Architecture June 1993: 48.

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⁸ Michael J. Crosbie, "Architectural Jazz and Solar Ingenuity," Architecture July 1987: 53-9.

⁹ Architectural Review October 1987: 46-51.

¹⁰ David Moffat, "Photovoltaic Prototypes," Architecture June 1993: 80-1.

APPENDIX: FIELD GUIDE

¹ John C. Kricher, A Field Guide to Eastern Forests, North America (Boston: Houghton Mifflin. 1988) 73-5.

TEXT REFERENCES

BAYS MOUNTAIN
RESEARCH CENTER

KINGSPORT, TENNESSEE

COMPREHENSIVE DESIGN
PROJECT I
ARCHITECTURE 480
FALL 1995

PETER LIZON, ADVISOR
DEAN ALMY, CONSULTANT

JUDITH C. SPARKS



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If architecture is to transcend its physical condition, its function as mere shelter, then its meaning, like interior space, must occupy an equivalent space within language."

—Steven Holl¹

INTRODUCTION

- 1 PROJECT STATEMENT
- 2 ISSUE IDENTIFICATION
- 3 DEFINITIONS
- 4 BACKGROUND

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PROJECT STATEMENT

NAME	BAYS MOUNTAIN RESEARCH ANNEX
LOCATION	Bays Mountain Park: Kingsport, Tennessee bordering reservoir, opposite existing nature center
SITE SIZE	park: 3000 acres area to build: app. 4 acres
SITE CHARACTER	smooth slope of land down to reservoir, completely wooded
PROJECT SIZE	approximately 10,000 sq.ft.
USERS	8 scientists in residence 2 scientists who commute from city 20-30 people for conferences 6 hikers (outside)
PURPOSE	to increase public awareness of the park and its amenities to establish the park as a "source center" for the regional scientific community to foster integration of scientific disciplines as a means of enhancing knowledge

ISSUE IDENTIFICATION

Three major issues will direct the design. *Context* is the primary issue: specifically, the juxtaposition of a built environment and a preserved natural one, but also the relationship of this new structure to existing buildings in terms of materiality, orientation, and tectonics. Secondly, the immediate and long-term impacts of this building on the *environment* (in construction and occupancy) will be addressed, especially in terms of energy consumption and laboratory waste disposal. And finally, this design will address the need for *communication* both among the scientists and with the outside world.

DEFINITIONS¹

con-serve *vt* to keep in a safe or sound state

dis-course *n* the process or faculty of reasoning
v speak or write at length on a topic

is-sue *n* the way an action or course of proceedings turns out; the event, a result, a consequence

knowl-edge *n* the fact of knowing a thing, state, person, etc.; familiarity gained by experience

phe-nom-e-nol-o-gy *n Philos.* the method of reduction whereby all factual knowledge and reasoned assumptions about a phenomenon are set aside so that pure intuition of its essence may be analyzed

pre-serve *vb* to keep safe from injury, harm, or destruction; maintain

sci-ence *n* the state or fact of knowing; knowledge or cognizance of something specified or implied

sus-tain *vt* to give support or relief to; nourish

tech-nol-o-gy *n* the branch of knowledge that deals with the mechanical arts or applied sciences

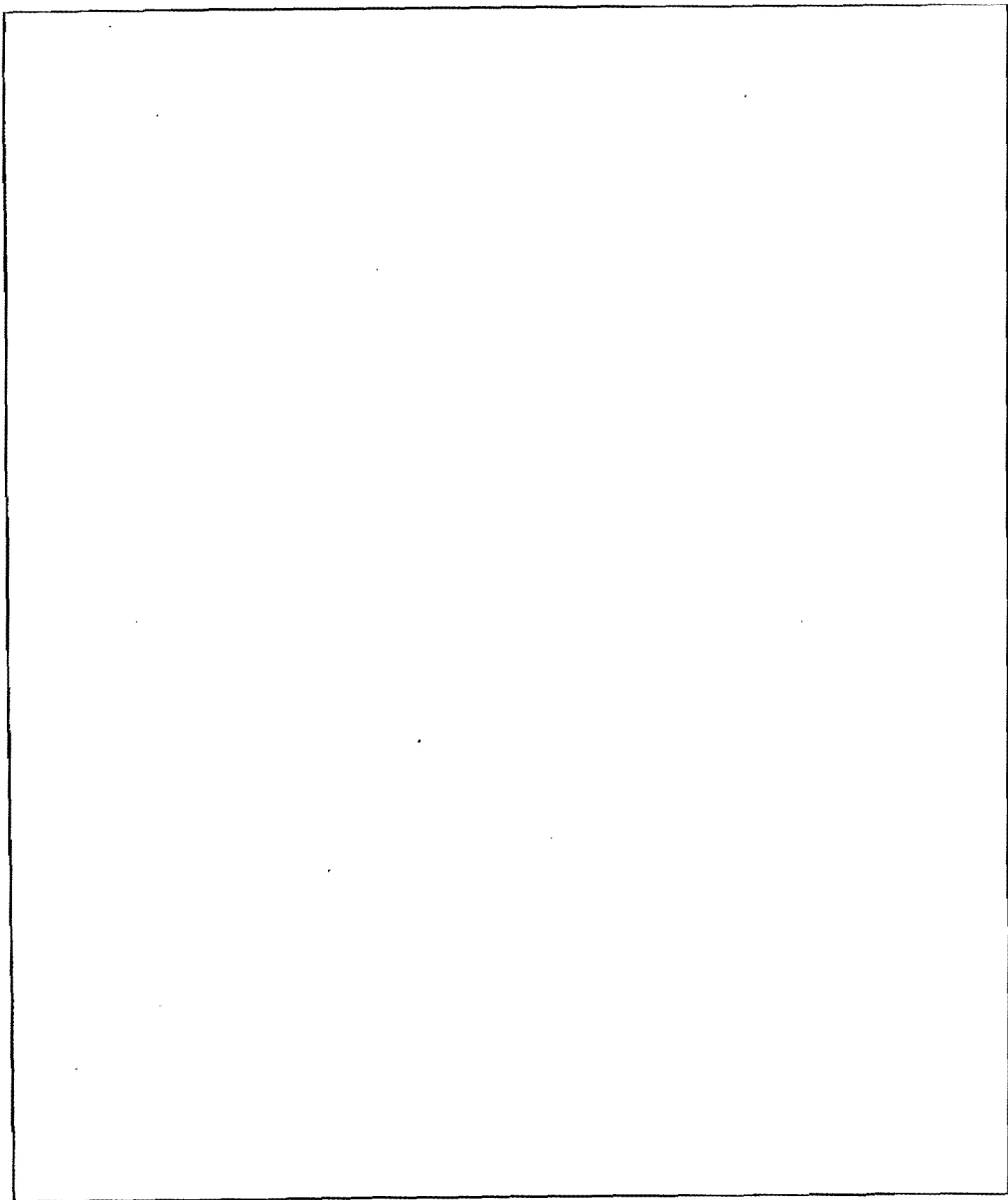
BAYS MOUNTAIN PARK is a 3,000-acre nature preserve owned by the city of Kingsport. The 44-acre lake, dammed in 1917, was the city's first reservoir until 1944. The park is protected by the Holston River Mountain on the northwest and Bays Ridge on the southeast.

Currently, the park's primary concern is environmental education for the students of Kingsport and Sullivan county. The nature center houses museum exhibits, a planetarium with a 40' dome, a library, the Discovery Theater, a gift shop, and a saltwater touch pool and aquariums. Astronomy and natural history programs have been prepared for the general public as well, and a number of animal habitats allow viewing of native wildlife species. Also, 25 miles of trails throughout the preserve are available for hiking and mountain biking. All totaled, park attendance is in excess of 120,000 people per year.

"Bays Mountain Park is much more than a typical park. It provides a place to contemplate and begin to understand the relationships that exist between land, plants, and animals, in short, our own survival." ²

BACKGROUND

**BAYS Mountain
MOUNTAIN PARK**
And Planetarium



SITE ANALYSIS

LOCATION

- 1.1 STATE
- 1.2 CITY
- 1.3 DESCRIPTION

LEGALITIES

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- 2.2 PARKING

NATURAL FEATURES

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- 3.2 DRAINAGE
- 3.3 VEGETATION
- 3.4 SOIL AND CAPABILITY

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- 4.1 EXISTING BUILDINGS
- 4.2 RESERVOIR DAM

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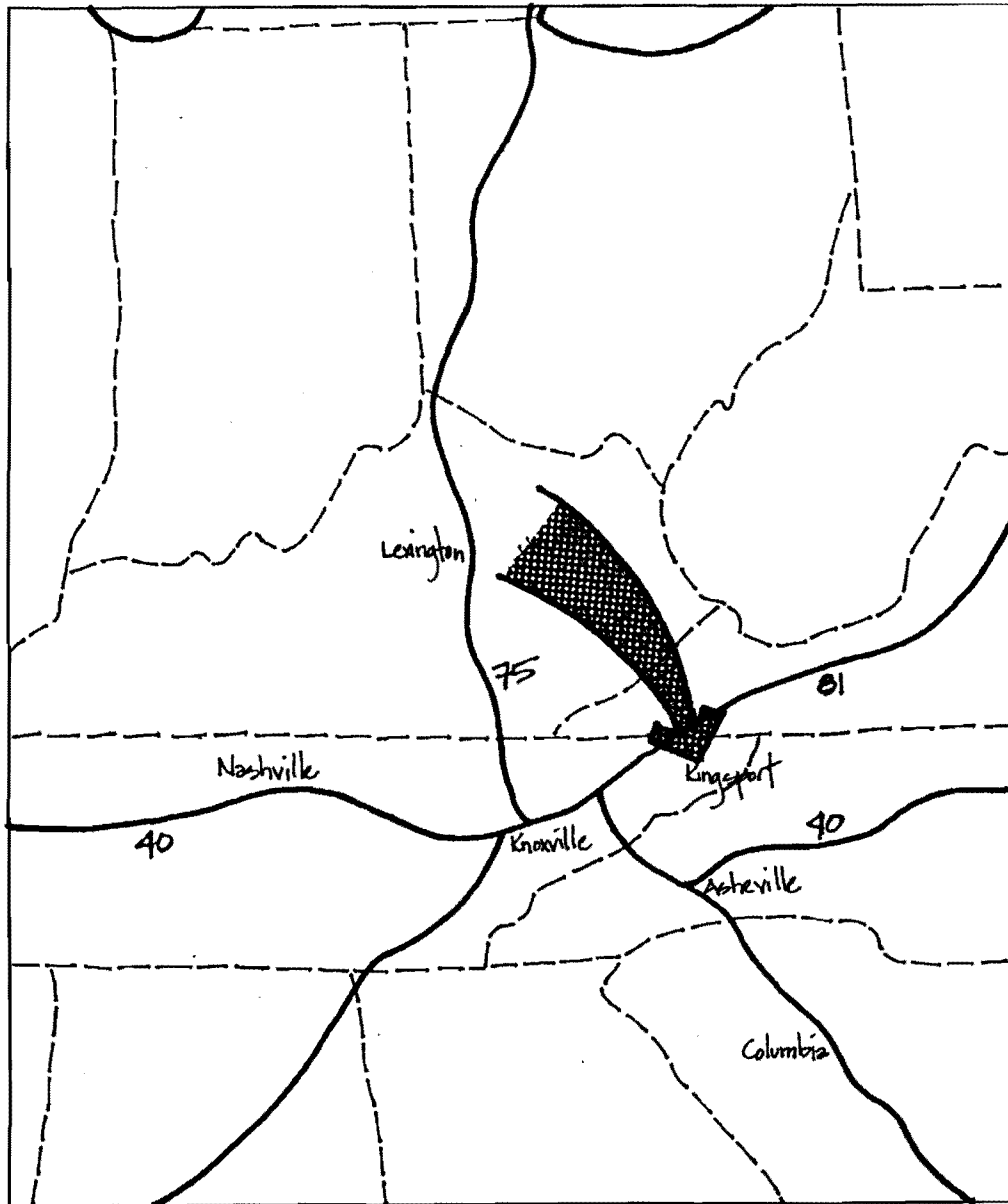
SITE ANALYSIS

INTRODUCTION

Having grown up in Kingsport, I never realized what a valuable and unique place it was until I was away for a number of years. (I am still pondering whether it was the "away" that changed my perspective, or the "years.") My ignorance of Kingsport's virtues was coupled with an almost foot-stomping declaration that I would eke out my existence in any locale but that one. Now I find myself stomping on my own foot and eager to return. This is not an eagerness bred of nostalgia, of those "good old days" of high school, but rather an eagerness to offer myself to the community and establish a reciprocity through which I am satisfied and the city is improved. Perhaps at this point, my eagerness outweighs my skill, but I see exciting things happening in Kingsport: things in which I want to be a contributing factor. Even before my physical return to Kingsport, my heart had returned. I found myself searching for a comprehensive design project that had the potential for long-term benefits to the city of Kingsport.

Bays Mountain Park is certainly one of the greatest aspects of Kingsport life. Few other cities, especially of Kingsport's size, can boast a nature preserve that covers a small mountain, complete with a native-animals zoo and a planetarium. Even fewer still could place this natural jewel in such proximity to one of the largest chemical manufacturing plants in the world. The potential for an integration of these two major elements was "staring me in the face," so to speak. Kingsport could certainly take greater advantage of its nature preserve by adding a research laboratory to its functions.

How rare it is to find, in such easy reach, a site so unspoiled by ignorant hands! While my conscience debated the implications of building even the smallest of structures in this natural environment, my architectural mind was already considering the design potential behind juxtaposing a high-tech, high-consumption facility with this completely natural setting. I reminded myself that this project was hypothetical (as I have repeatedly through the semester) and determined that the best location for this laboratory facility would be across the reservoir: separated from the more populated area of the park, but within visual range of it. It is a beautiful site *at* which to look and *from* which to look, with enough "presence" to be understood without dominating the experience of the place.

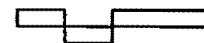


LOCATION

STATE

Days Mountain Park is located in Upper East Tennessee, in the city of Kingsport.

Interstate 81 is nearby.



1.1

LOCATION

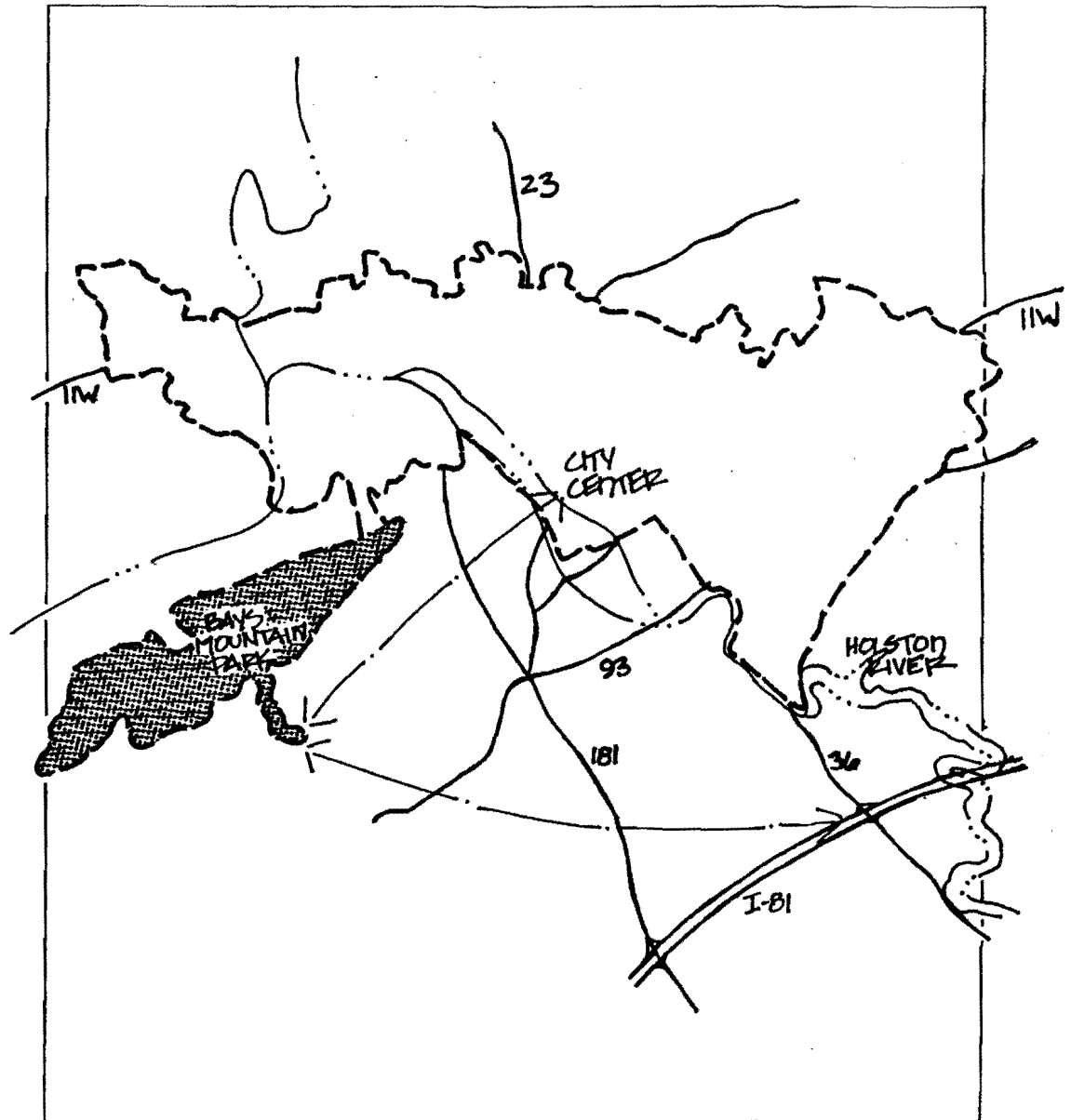
CITY

The park is situated to the southwest of the city of Kingsport.

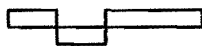
It straddles the Sullivan-Hawkins County line. This building site is located in Sullivan County.

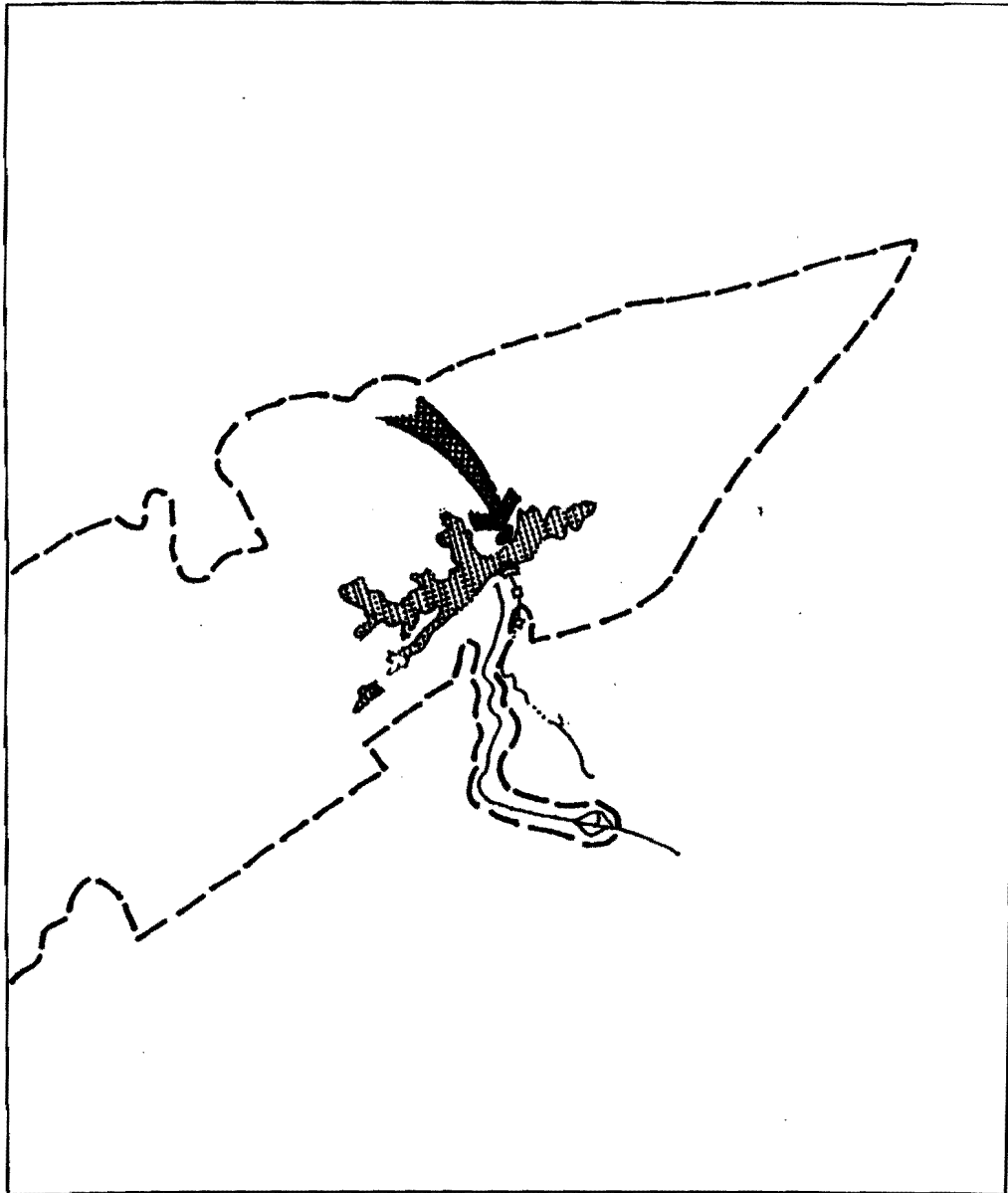
Access to the park is lengthy, but not difficult.

Kingsport



1.2



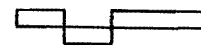


LOCATION

PARK

The building site is located on the north-western edge of the reservoir, across from the dam and nature center.

It occupies the east side of a peninsula.



1.3

LEGALITIES

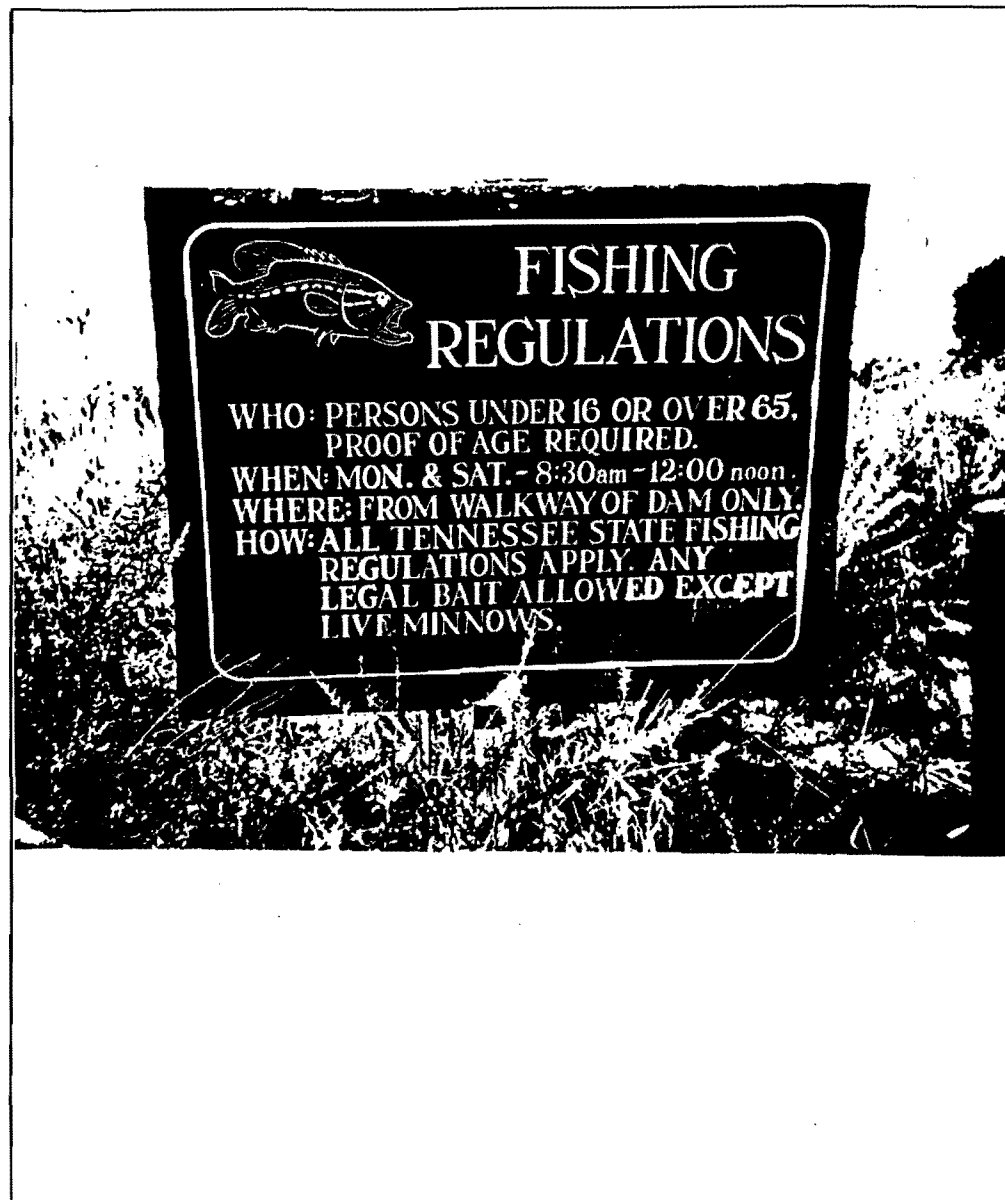
DESCRIPTION

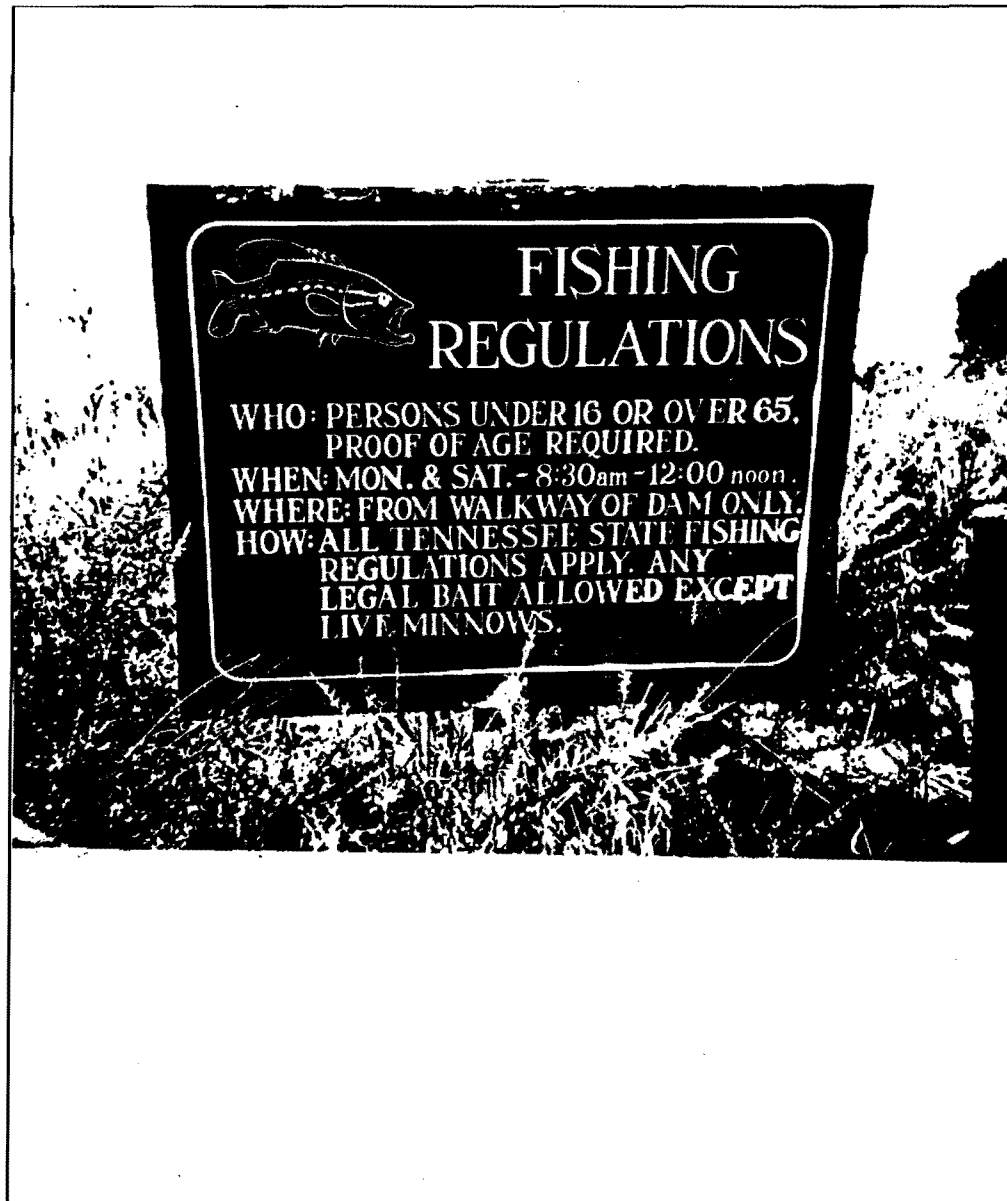
CONDITION:

Bays Mountain Park is owned by the City of Kingsport.

It is under the jurisdiction of the city's Department of Leisure Services.

Building within the park is extremely limited in an effort to maintain it as a nature preserve.



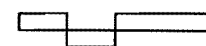


LEGALITIES

DESCRIPTION

RESPONSE:

All actions taken on this property must be approved by both the city leaders and the Department of Leisure Services.



2.1b

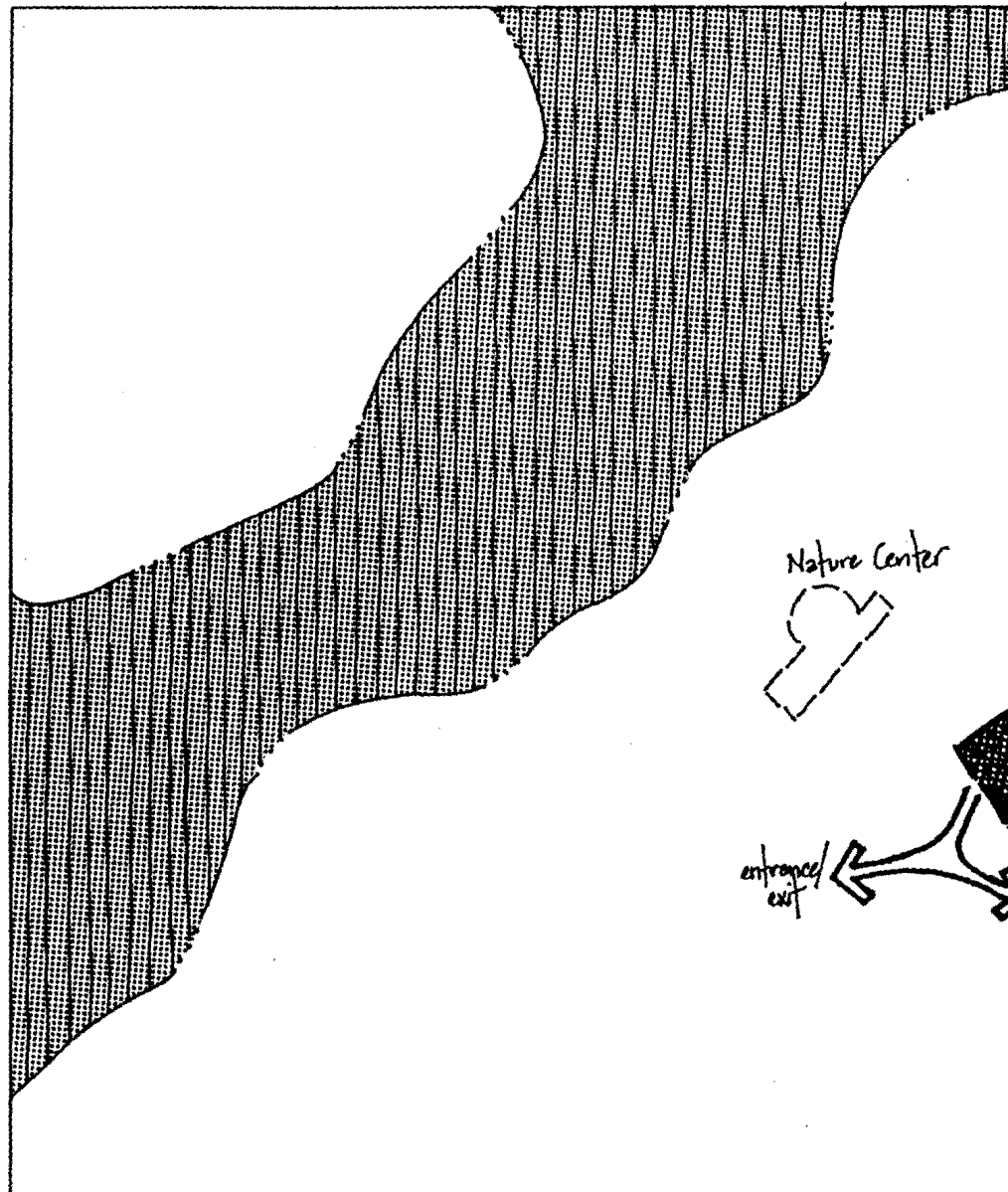
LEGALITIES

PARKING

CONDITION:

Parking for visitors is provided behind the nature center.

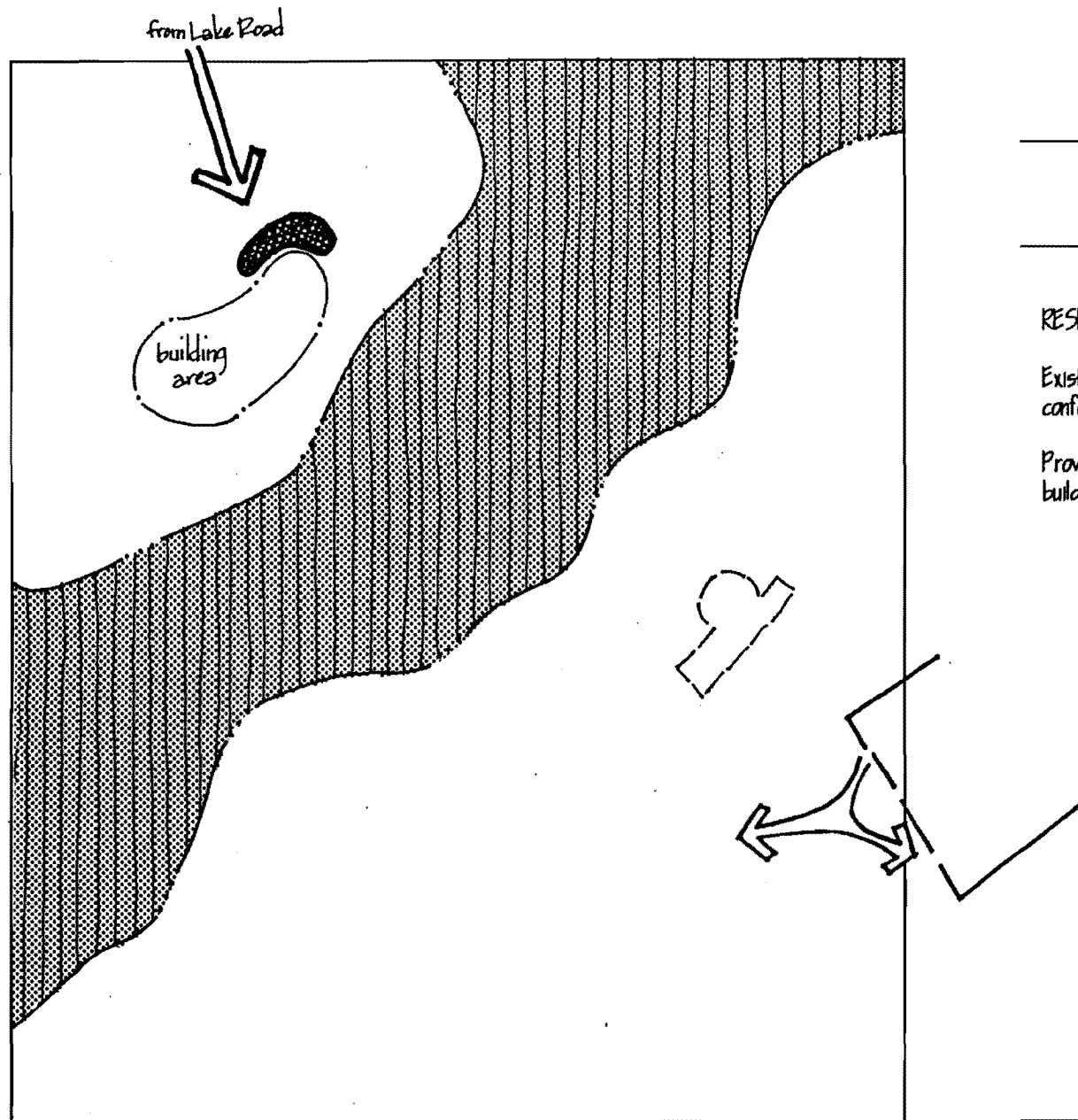
Staff members park in designated places.



2.2a

0 50 100 200 ft.





LEGALITIES

PARKING

RESPONSE:

Existing parking is sufficient for occasional conferences and other visitors.

Provide designated staff spaces near new building for scientists in residence.



0 50 100 200 ft.

2.2b

NATURAL FEATURES

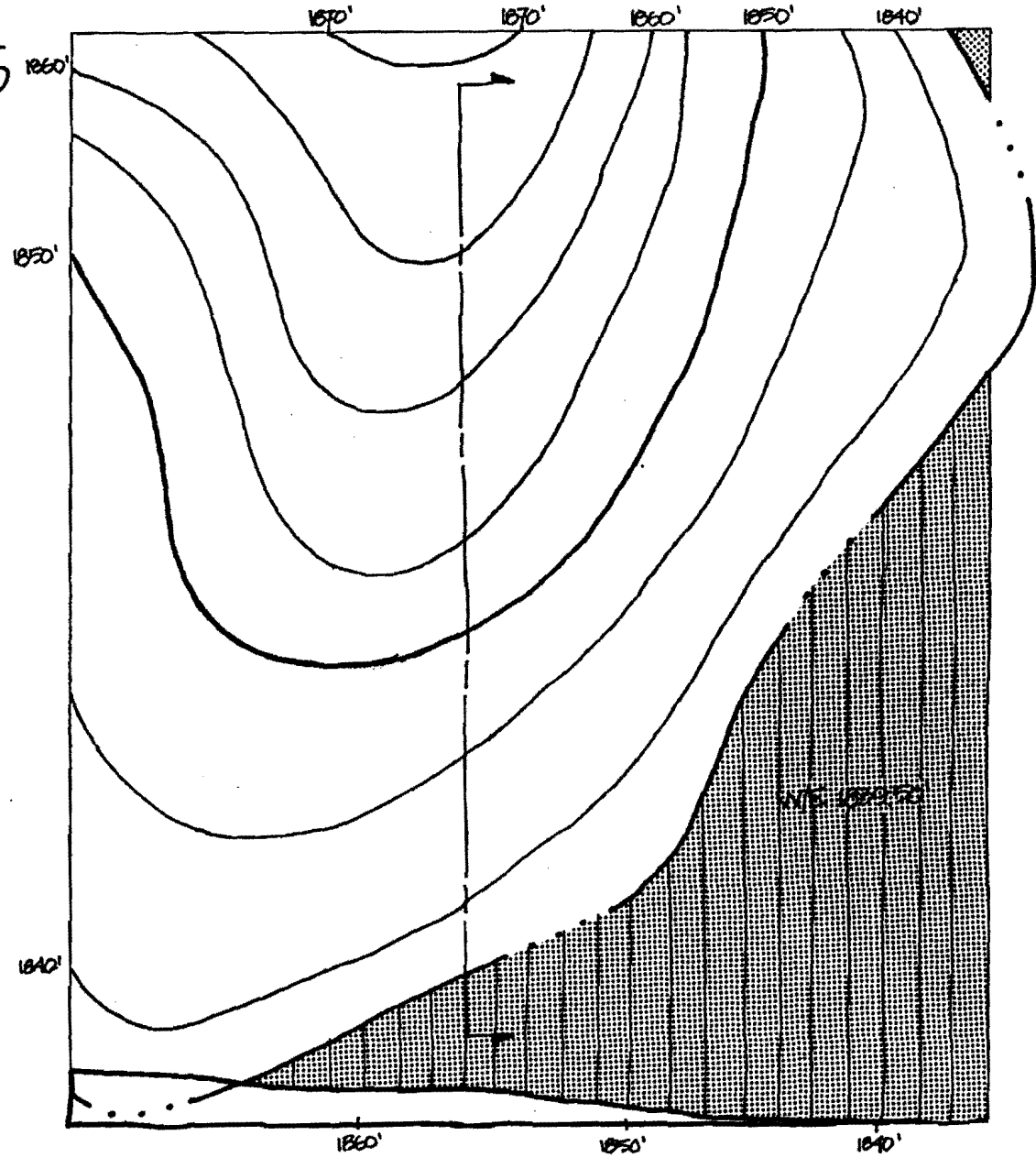
CONTOURS

CONDITION:

Land slopes gently and smoothly down to the water.

Water level is maintained by the dam at 1839.5 feet.

There are no outstanding topographical features.



3.1a

0 25 50 100 ft.



LEGALITIES

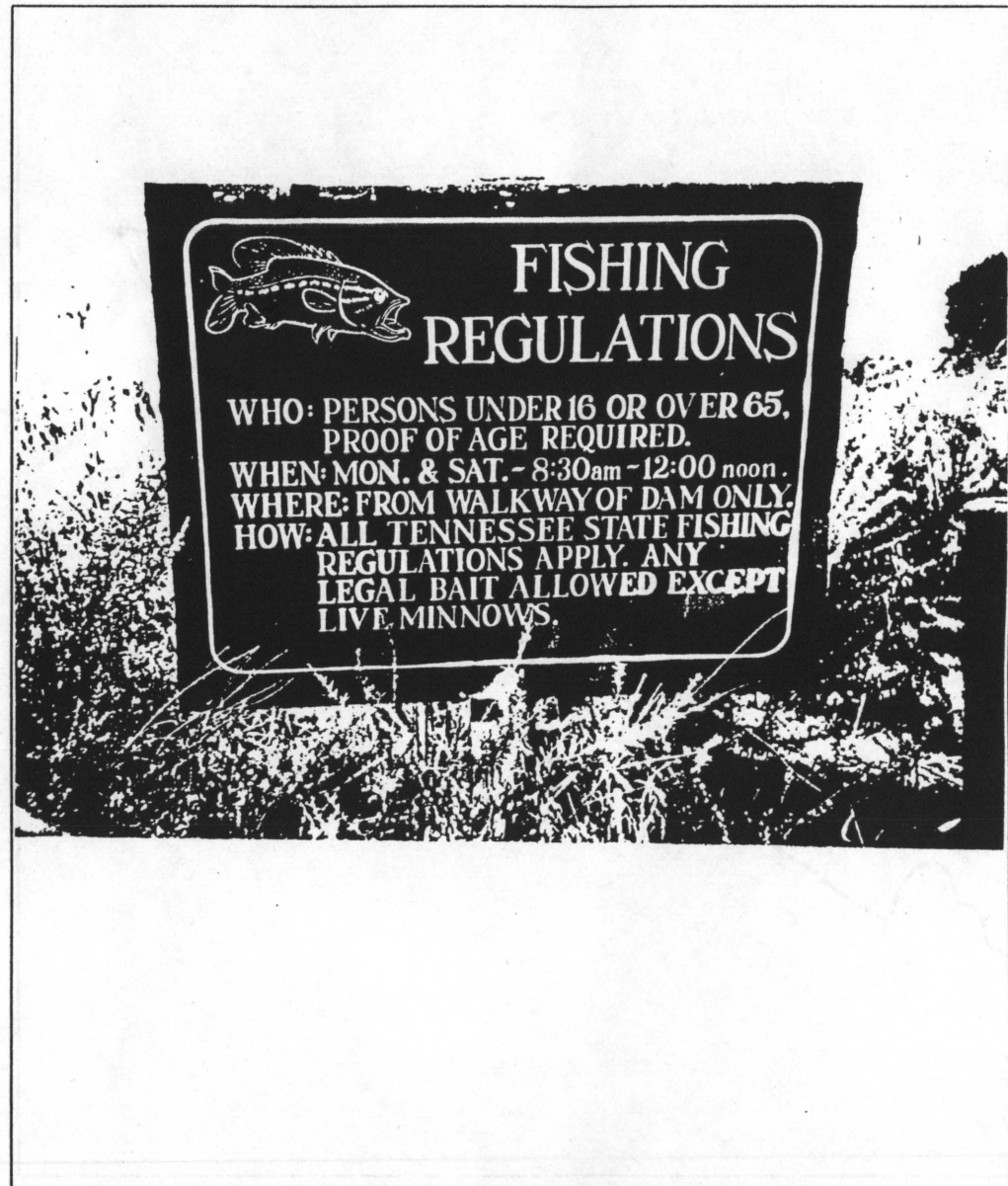
DESCRIPTION

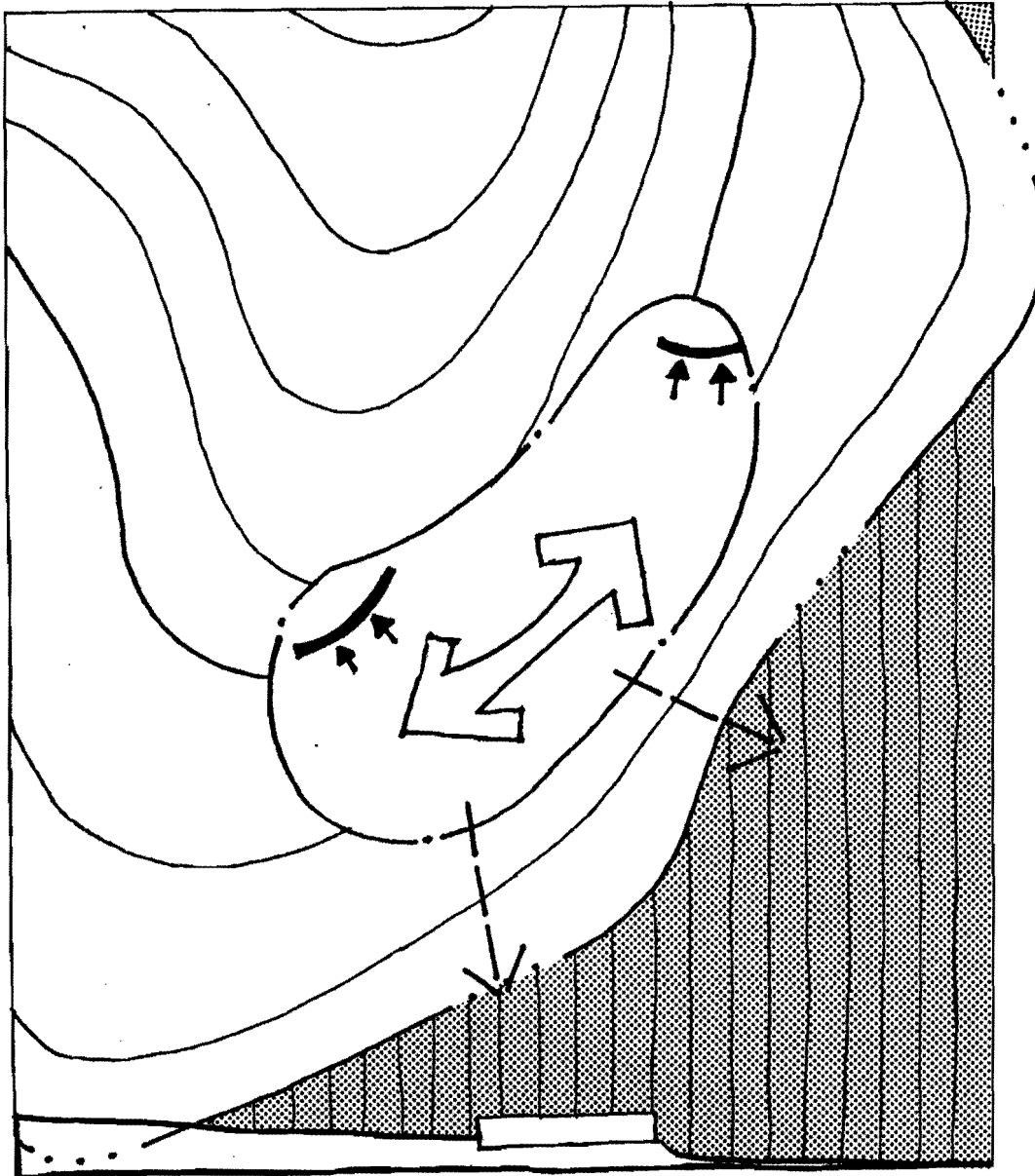
CONDITION:

Bays Mountain Park is owned by the City of Kingsport.

It is under the jurisdiction of the city's Department of Leisure Services.

Building within the park is extremely limited in an effort to maintain it as a nature preserve.





NATURAL FEATURES

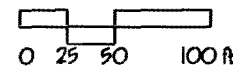
CONTOURS

RESPONSE:

Orient building to follow contours, minimizing necessary cut-and-fill.

Take advantage of slope for hiding unsightly functions and emphasizing good views.

Dam alleviates flooding concerns.



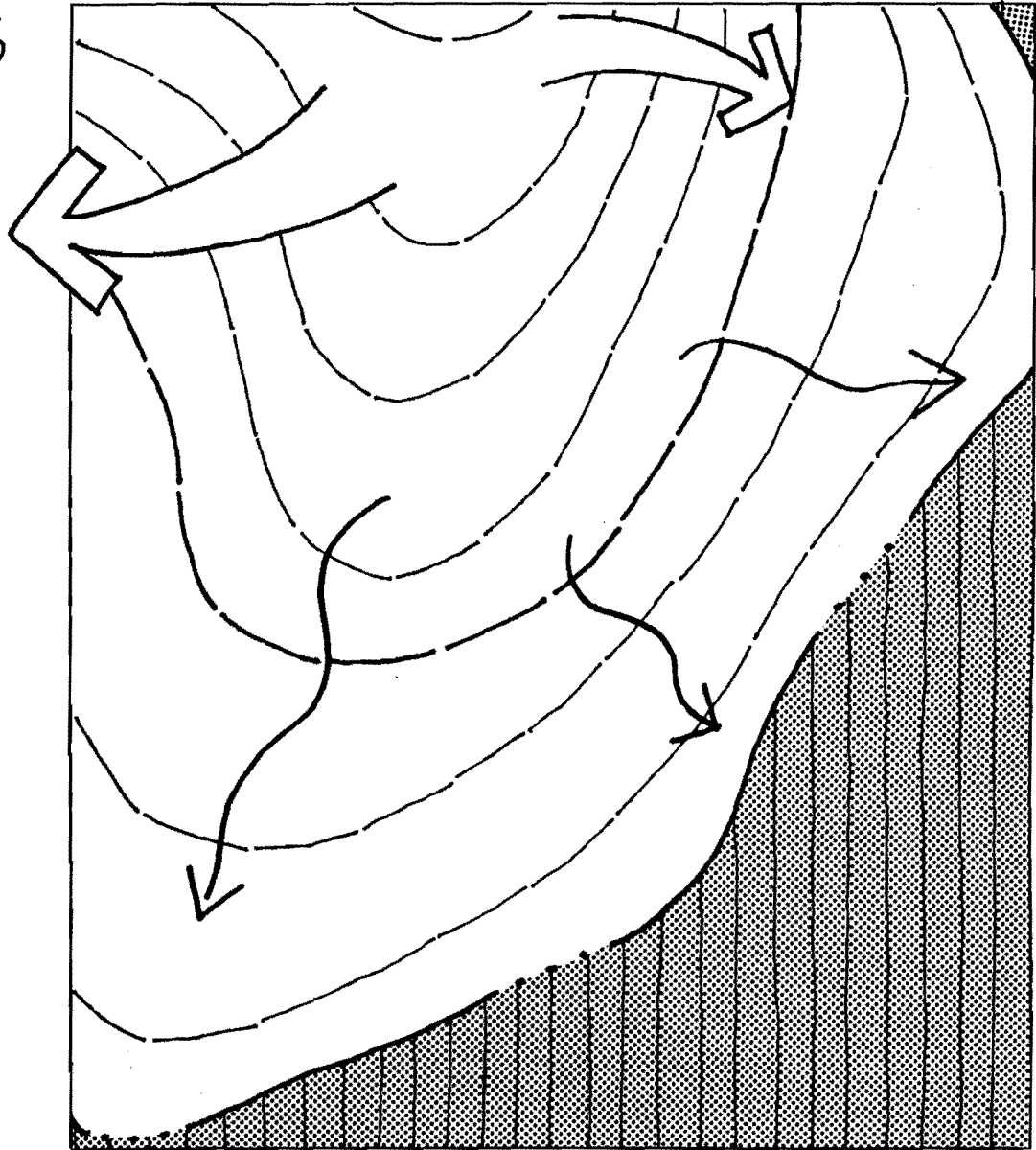
3.16

NATURAL FEATURES

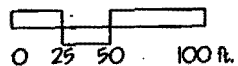
DRAINAGE

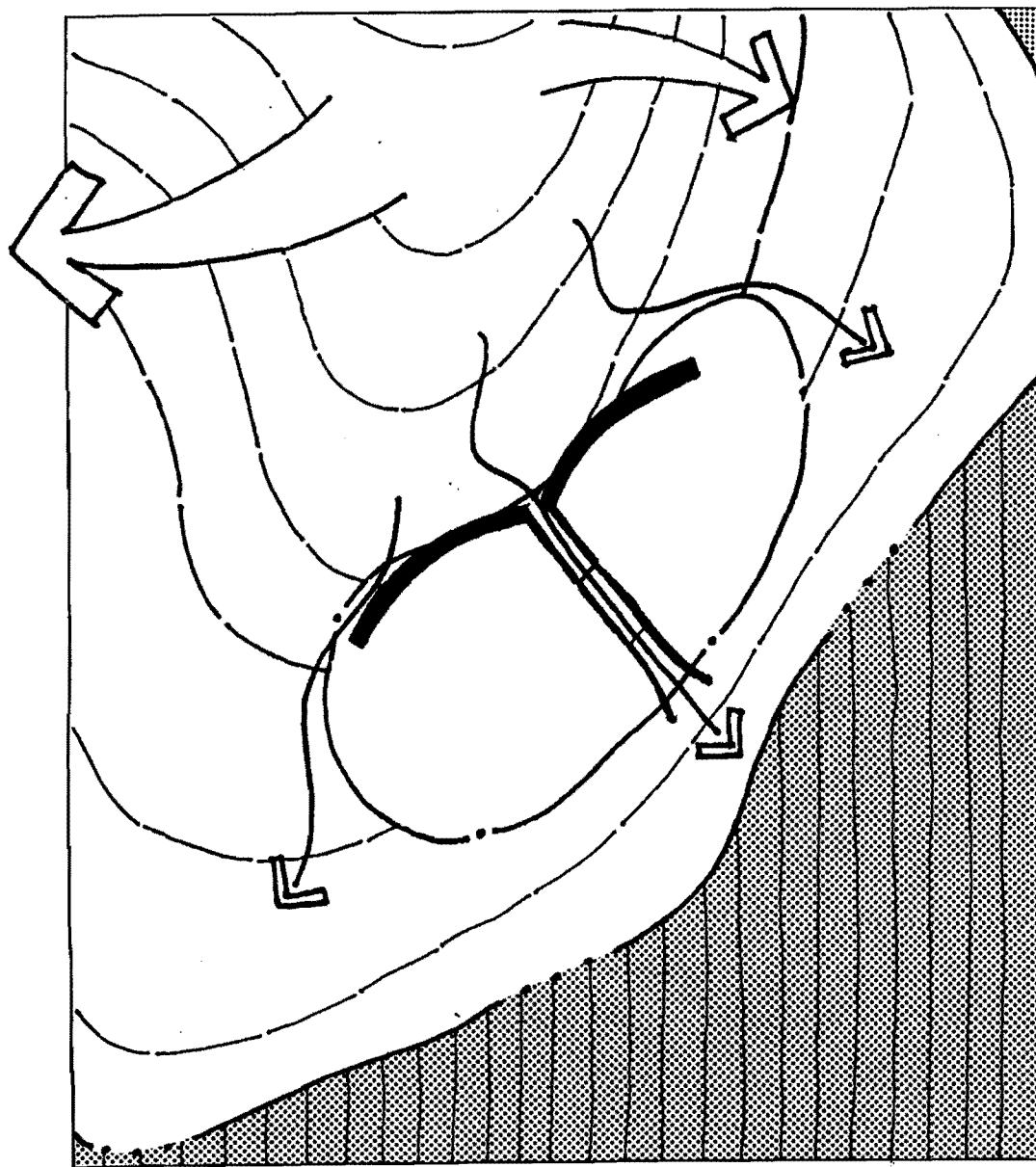
CONDITION:

Majority of runoff collects in small streams which feed the reservoir.



3.2a





NATURAL FEATURES

DRAINAGE

RESPONSE:

Maintain this pattern as much as possible.



0 25 50 100 ft.

3.2b

NATURAL FEATURES

VEGETATION

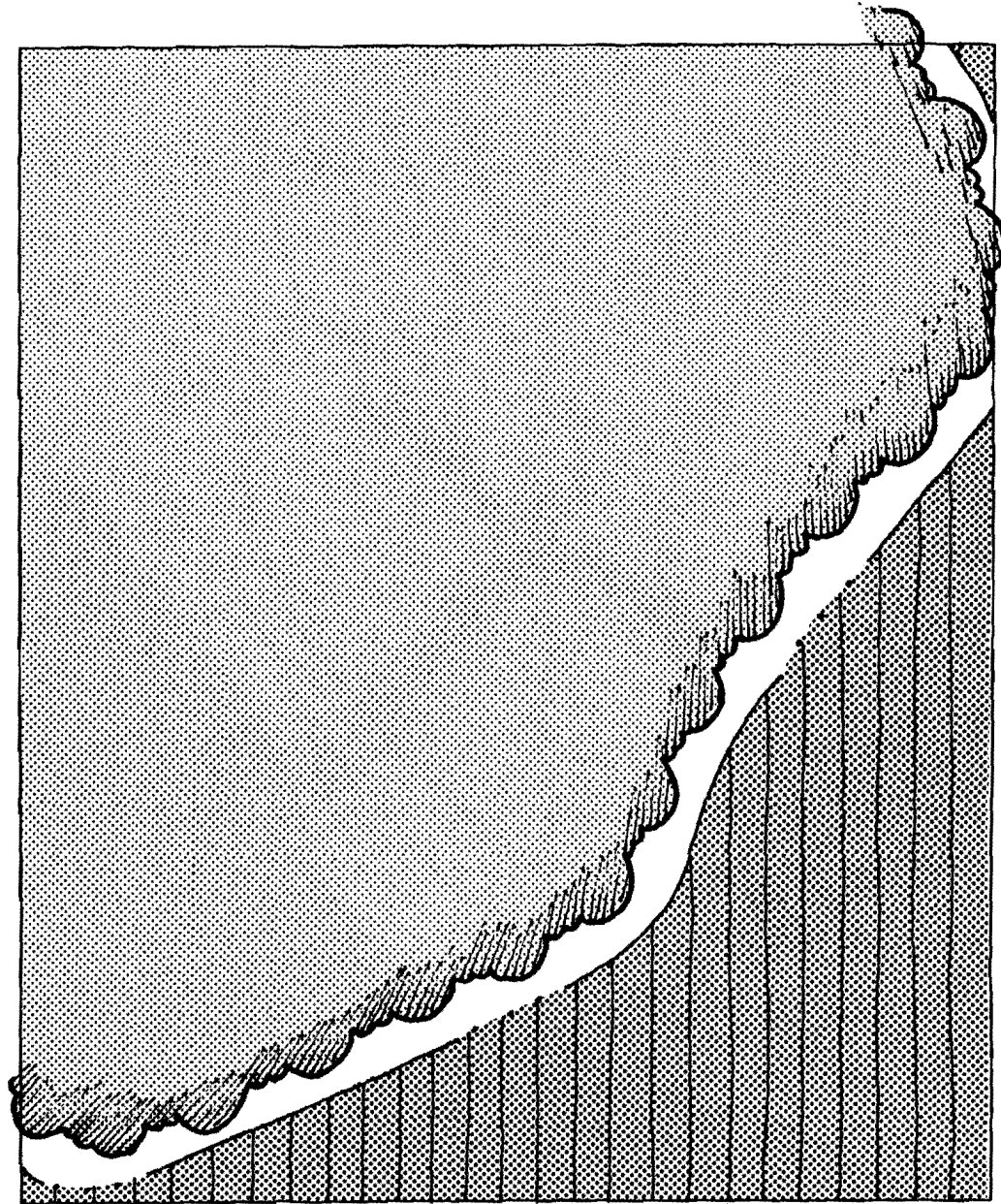
CONDITION:

Land is entirely wooded with a mix of deciduous and evergreen trees.

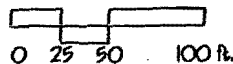
Very few trees are over 50 years old, and most are less than 12" in diameter.

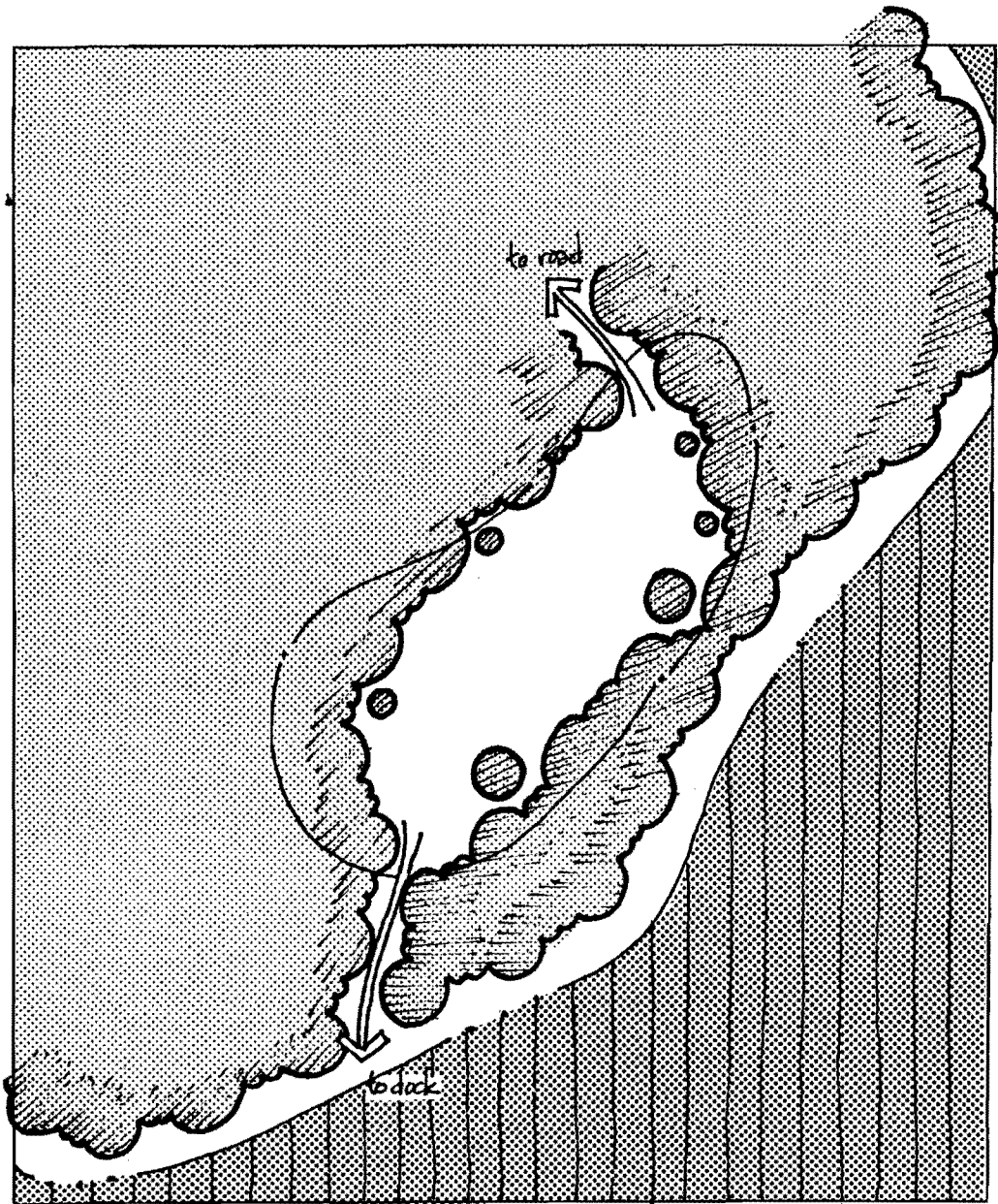
Undergrowth is not excessive.

Vegetation becomes swamp-like at reservoir inlets.



3.3a





NATURAL FEATURES

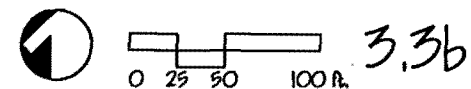
VEGETATION

RESPONSE:

Minimize amount of vegetation cleared for construction, as well as for building footprint.

Choose several mature, healthy trees to preserve within the building area.

Consider using felled trees as structure or finishes in the new building.



NATURAL FEATURES

VEGETATION

FIELD GUIDE

Appalachian Cove Forest

Description: The Cove Forest conveys a sense of primeval wilderness. Two trees, White Basswood and Carolina Silverbell, are the key indicator species, sharing the forest with many other, more widely distributed species. The forest is very lush, with Tuliptrees over 100 ft. tall and a colorful understory of Redbud, Fraser Magnolia ("Umbrella Tree"), and Flowering Dogwood. Most trees are deciduous, though Eastern Hemlock may be occasionally present. The shrub layer is thickly developed and colorful in spring with dense clumps of Great Rhododendron and Mountain Laurel. All things seem abundant: trees, shrubs, birds, and even salamanders. The obvious high species richness of trees and shrubs is the best field mark of this forest.

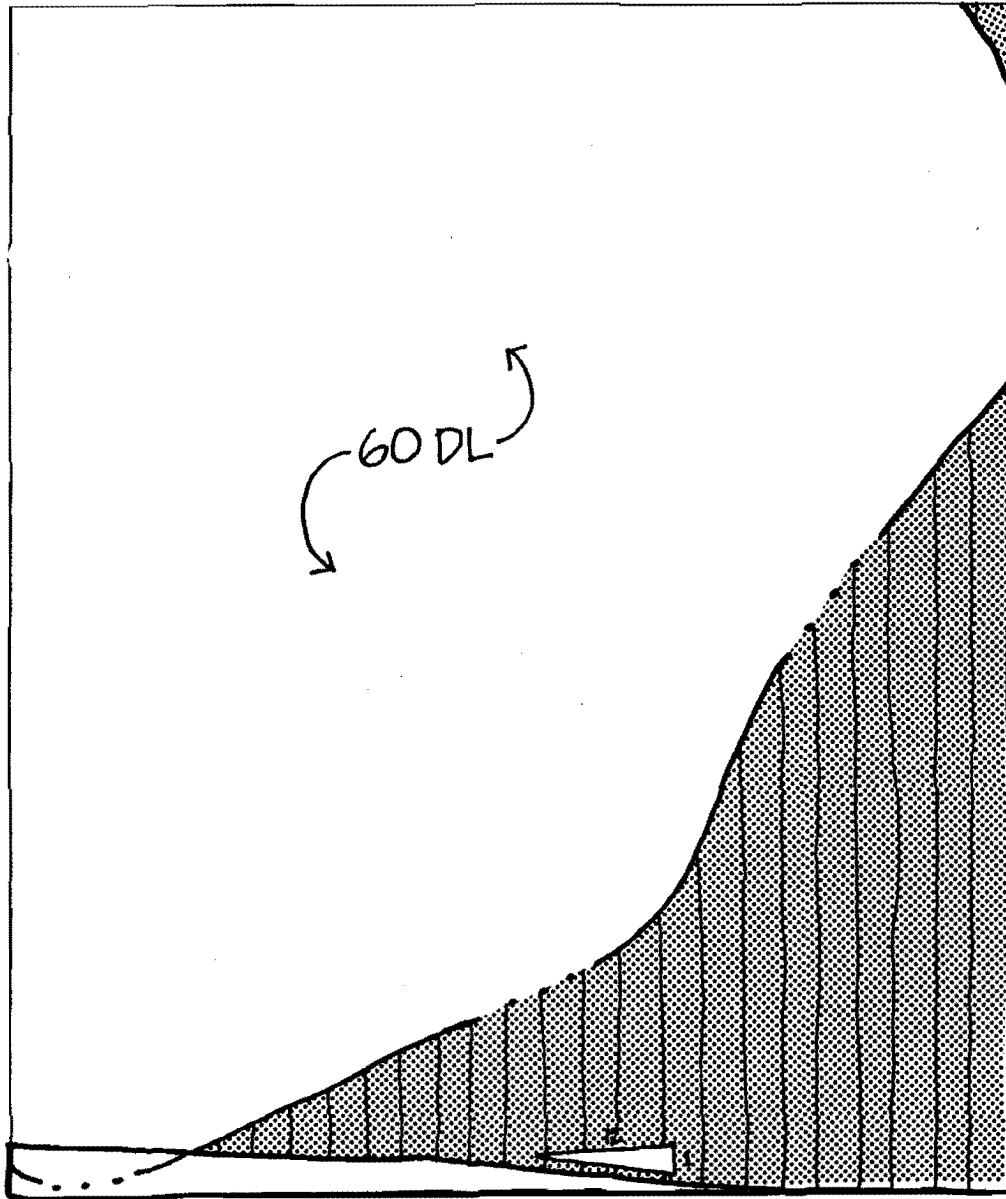
Remarks: The highest species richness of trees in North America occurs in the Cumberland and Allegheny mountains, especially within the confines of Great Smoky Mountain National Park. Species richness decreases to the west and north. The Appalachian Cove Forest has 25-30 tree species, though you will not find all of these in any single stand. Normally, any Cove Forest will support 6-8 dominant species. Cove Forests are well developed in the Great Smokies, but also occur throughout the Appalachians, especially along ravines.

NATURAL FEATURES

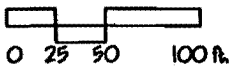
SOIL AND CAPABILITY

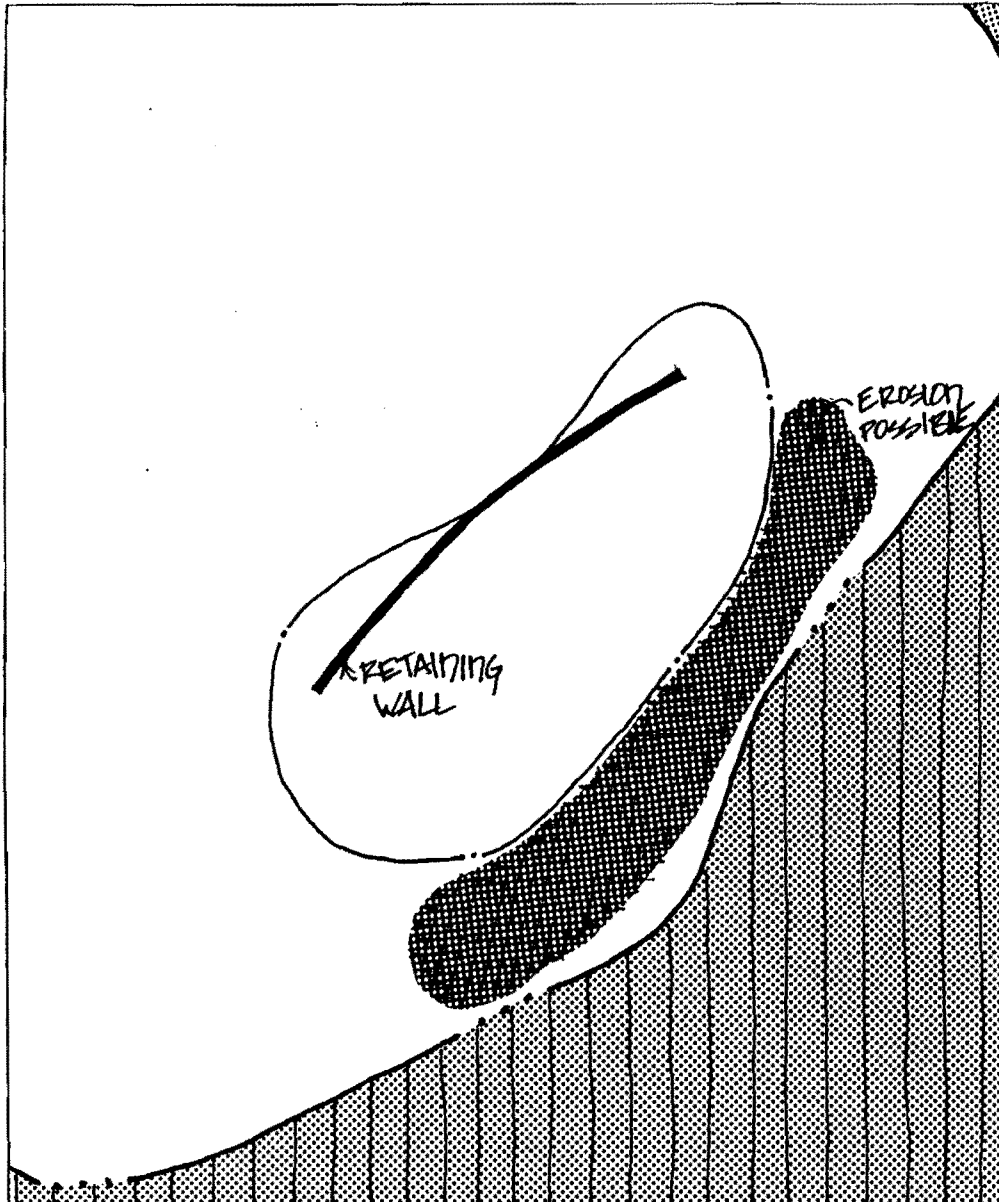
CONDITION:

Area is classified 60 DL:
a Jefferson st. type soil with 12-20%
grade slope and slight erosion.



3.4a





NATURAL FEATURES

SOIL AND CAPABILITY

RESPONSE:

No serious soil or erosion concerns are present.

Degree of slope suggests use of cut-and-fill techniques.

Do not allow building to increase erosion.

Retaining wall on NW side may be necessary.



0 25 50 100 ft.

3.4b

HUMAN FEATURES

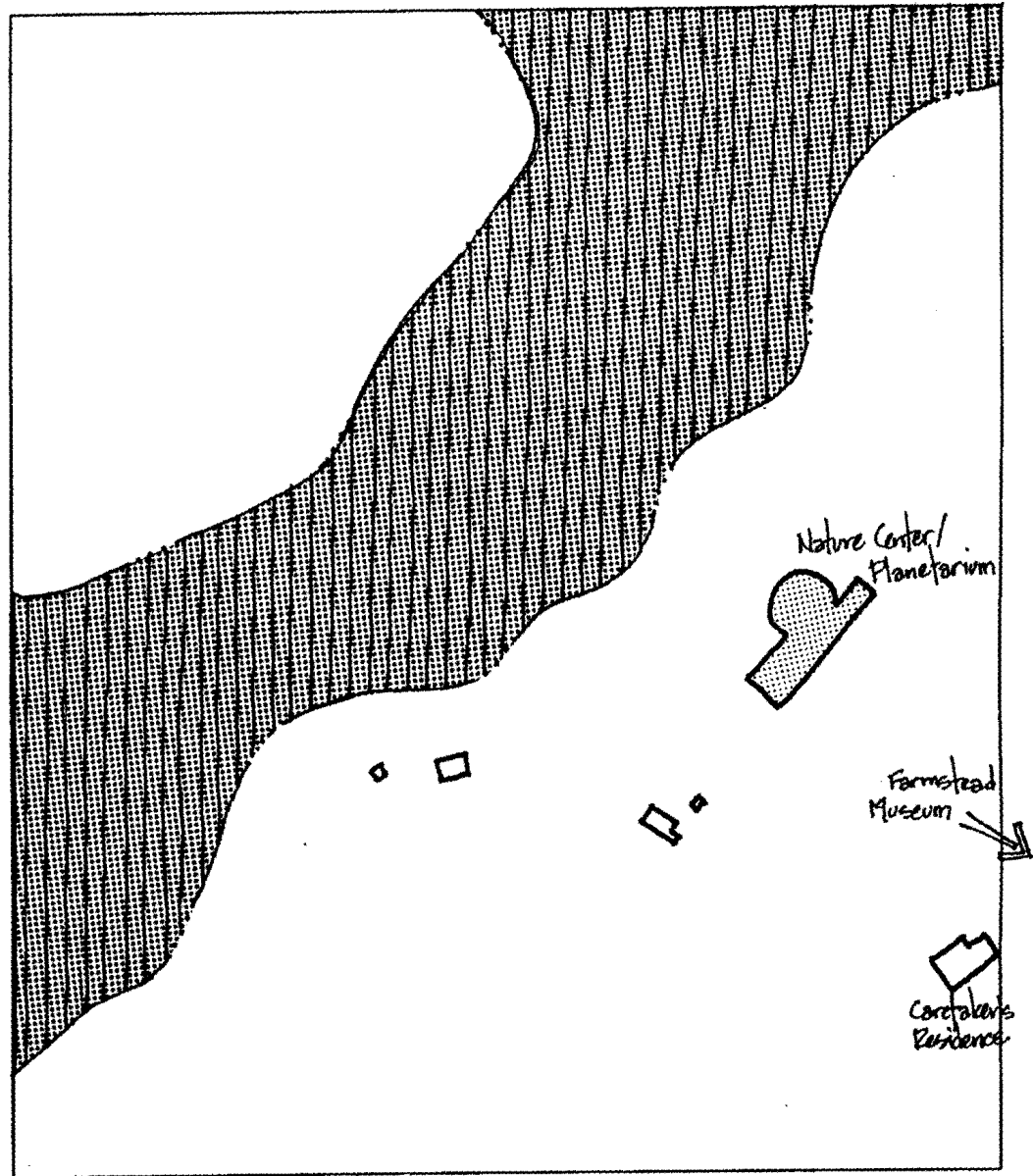
EXISTING BUILDINGS

CONDITION:

There are presently no artificial elements in the building area.

The nature center is the primary building in the park.

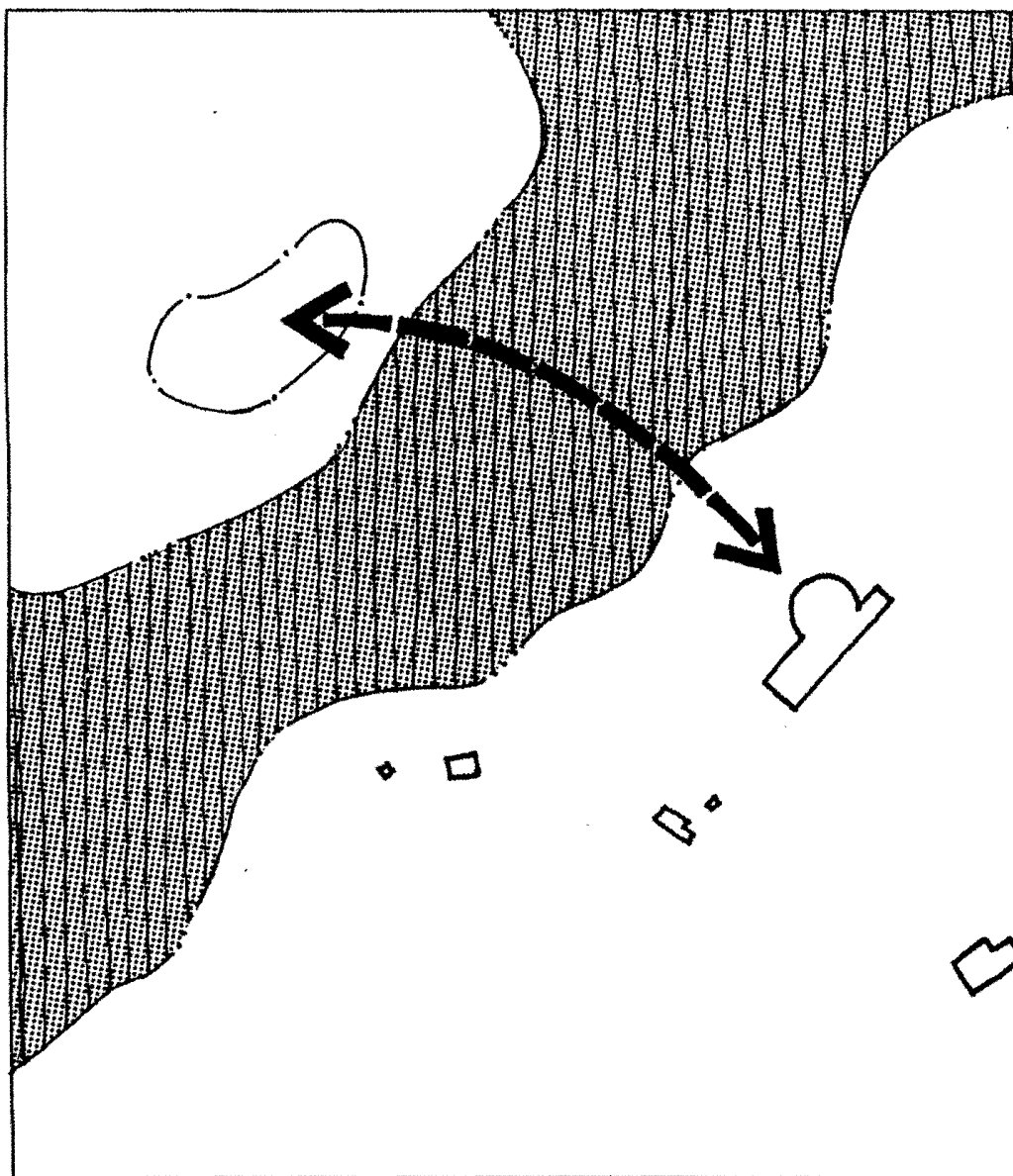
Exteriors are darkly stained wood and sandstone--gathered within the park.



4.1a

0 50 100 200 ft.





HUMAN FEATURES

EXISTING BUILDINGS

RESPONSE:

Use new structure to "address" and balance older buildings.

Make exterior cladding of new building refer to or compare with older.



0 50 100 200 ft.

4.1b

HUMAN FEATURES

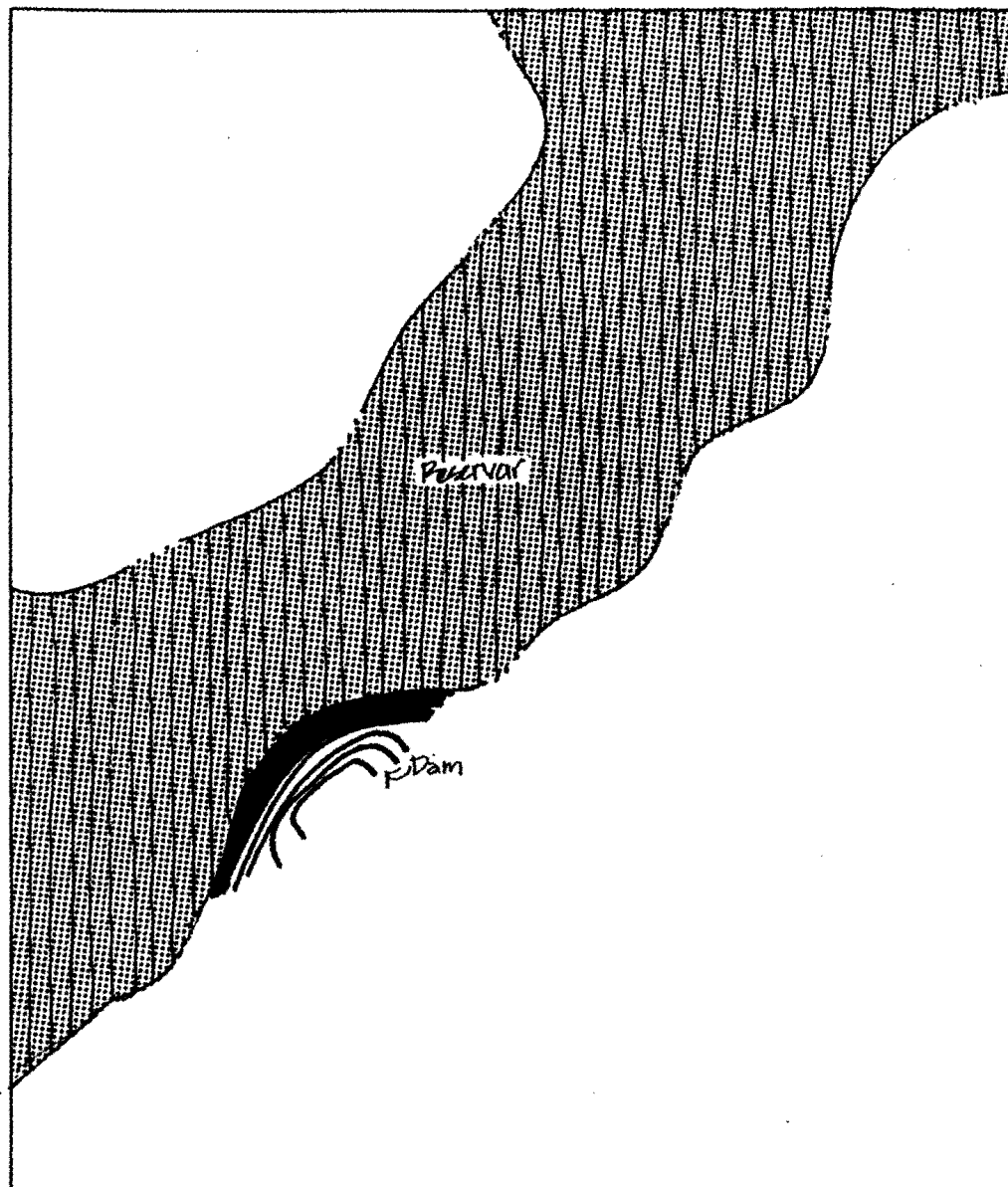
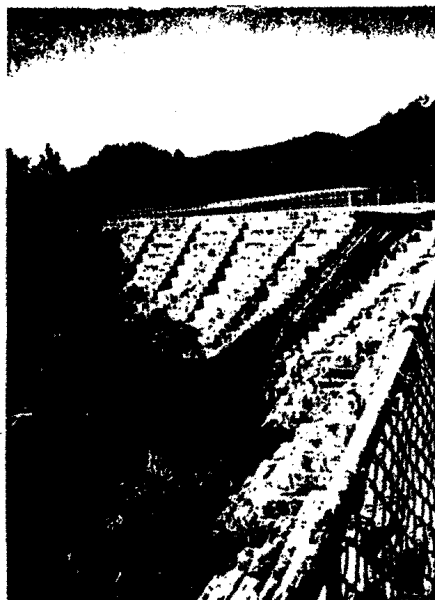
RESERVOIR DAM

CONDITION:

The dam holds the reservoir at a constant level.

It is made of earth and sandstone. The stone is exposed on the open side of the dam.

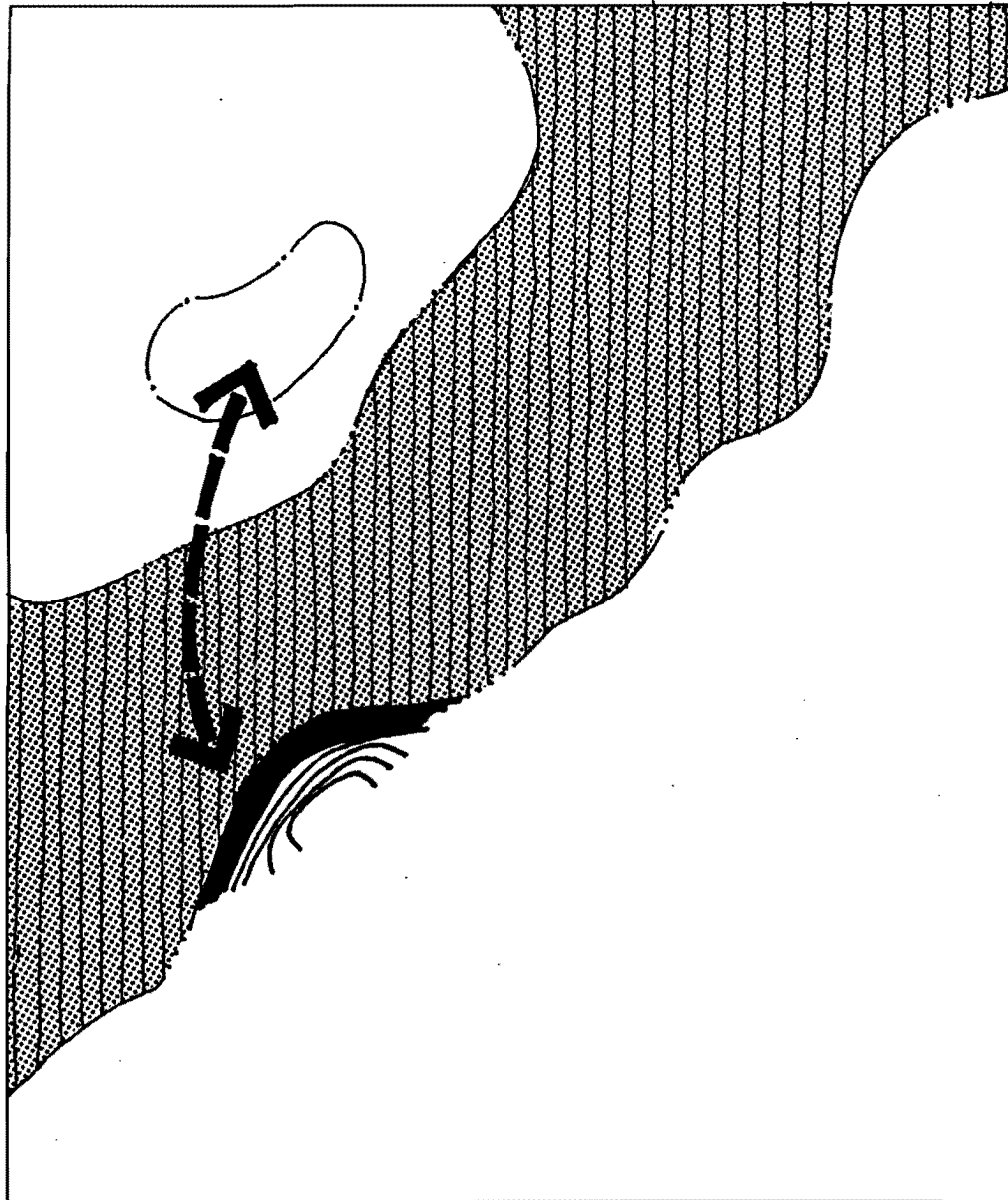
A walkway tops it.



4.2a

0 50 100 200 ft.





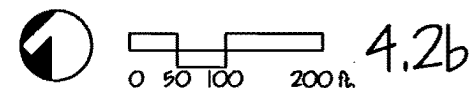
HUMAN FEATURES

RESERVOIR DAM

RESPONSE:

New structure "respects" importance of dam. Use it as a design reference.

Create visual or ideological "link" with dam.



CIRCULATION

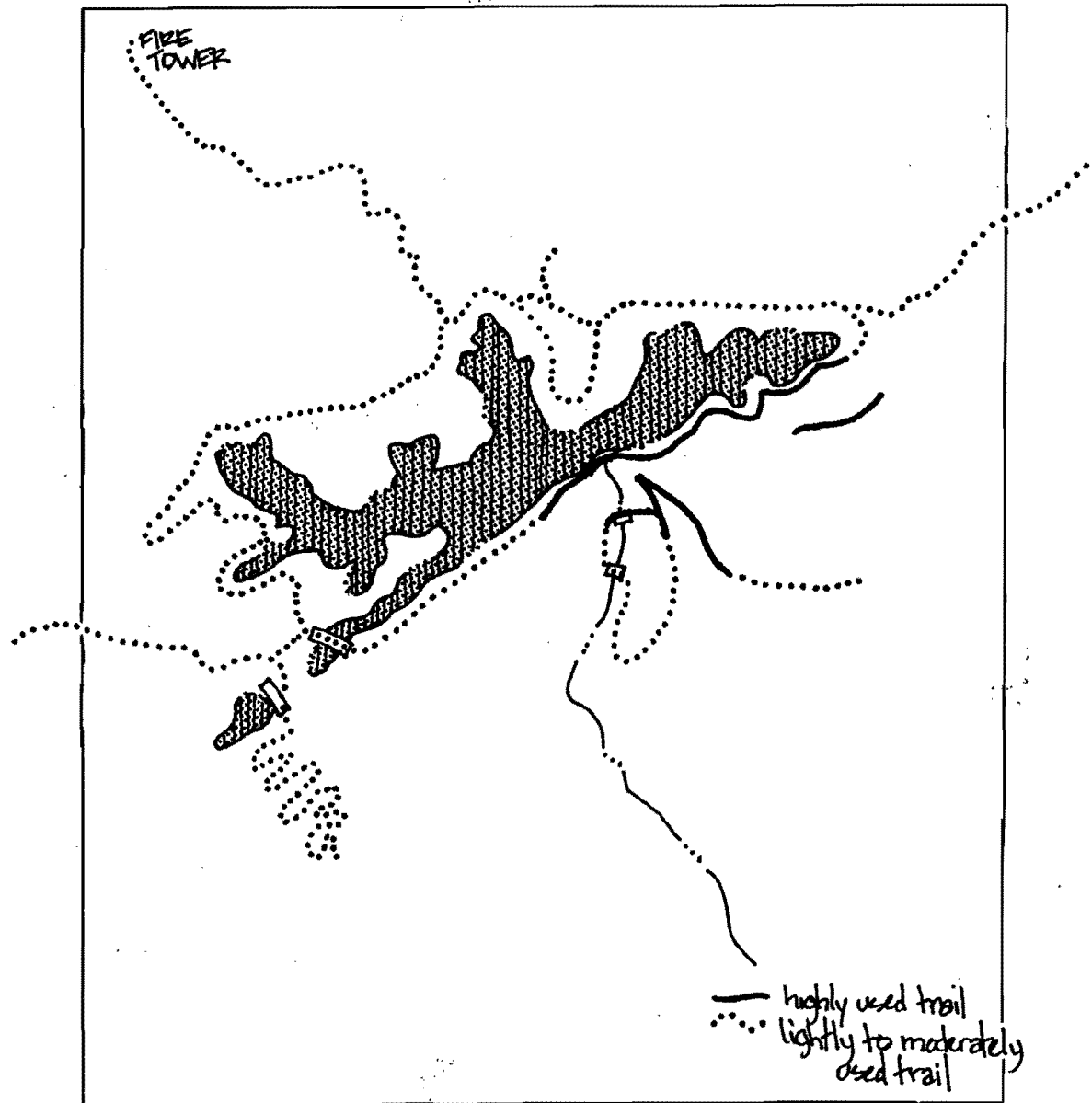
TRAILS

CONDITION:

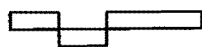
Trails are well kept, infringing as little as possible on the natural environment.

Trails around nature center are asphalt and heavily trafficked. All others are dirt.

Trail bridges are wooden.



5.1a



CIRCULATION

TRAILS

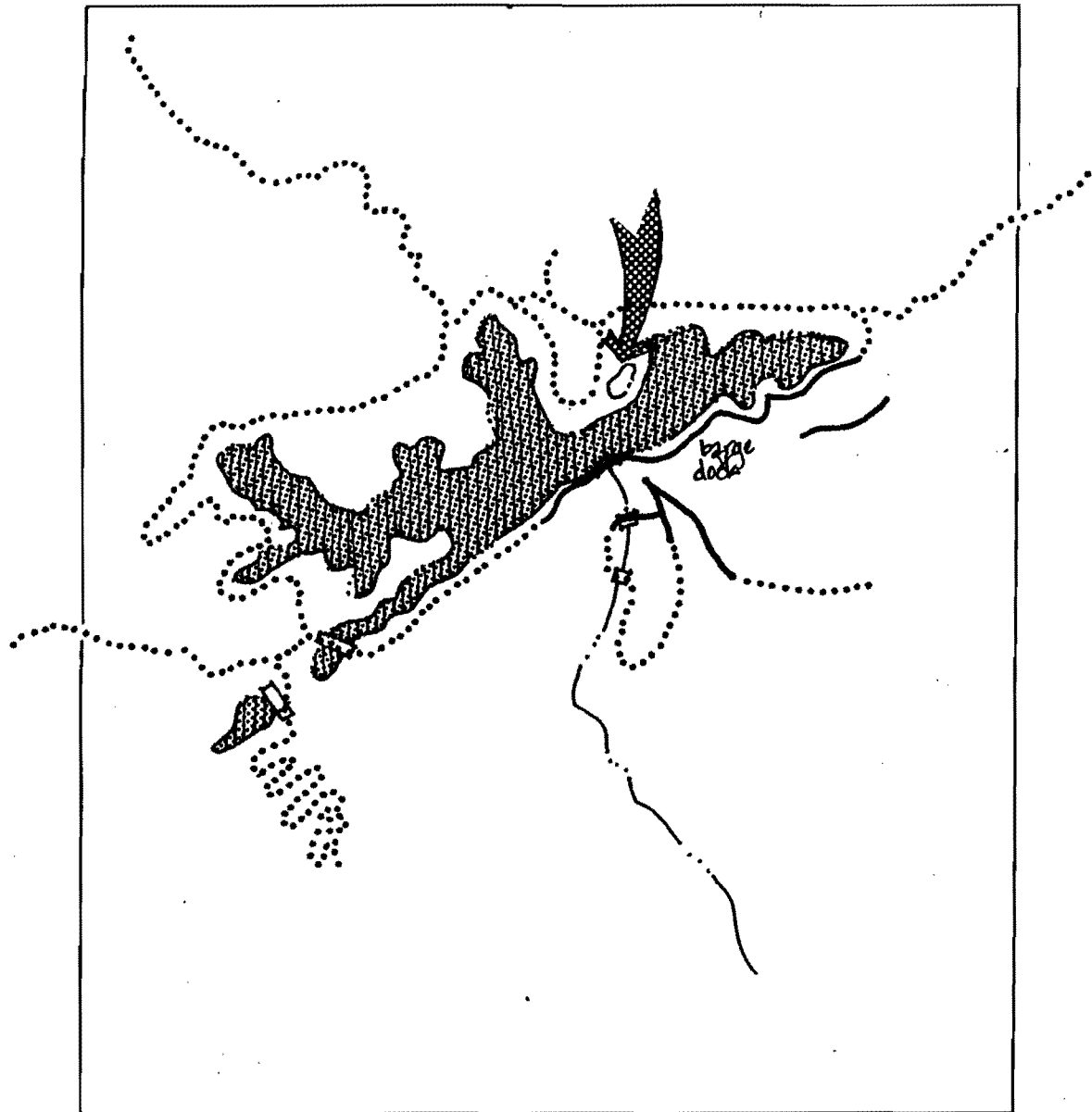
RESPONSE:

Situate building to cause minimum amount of disturbance to trail system.

Look for means of improving trails without further disrupting the environment.

New trails should continue the style and quality of existing trails.

Locate building to draw interested people to less used areas of the park.



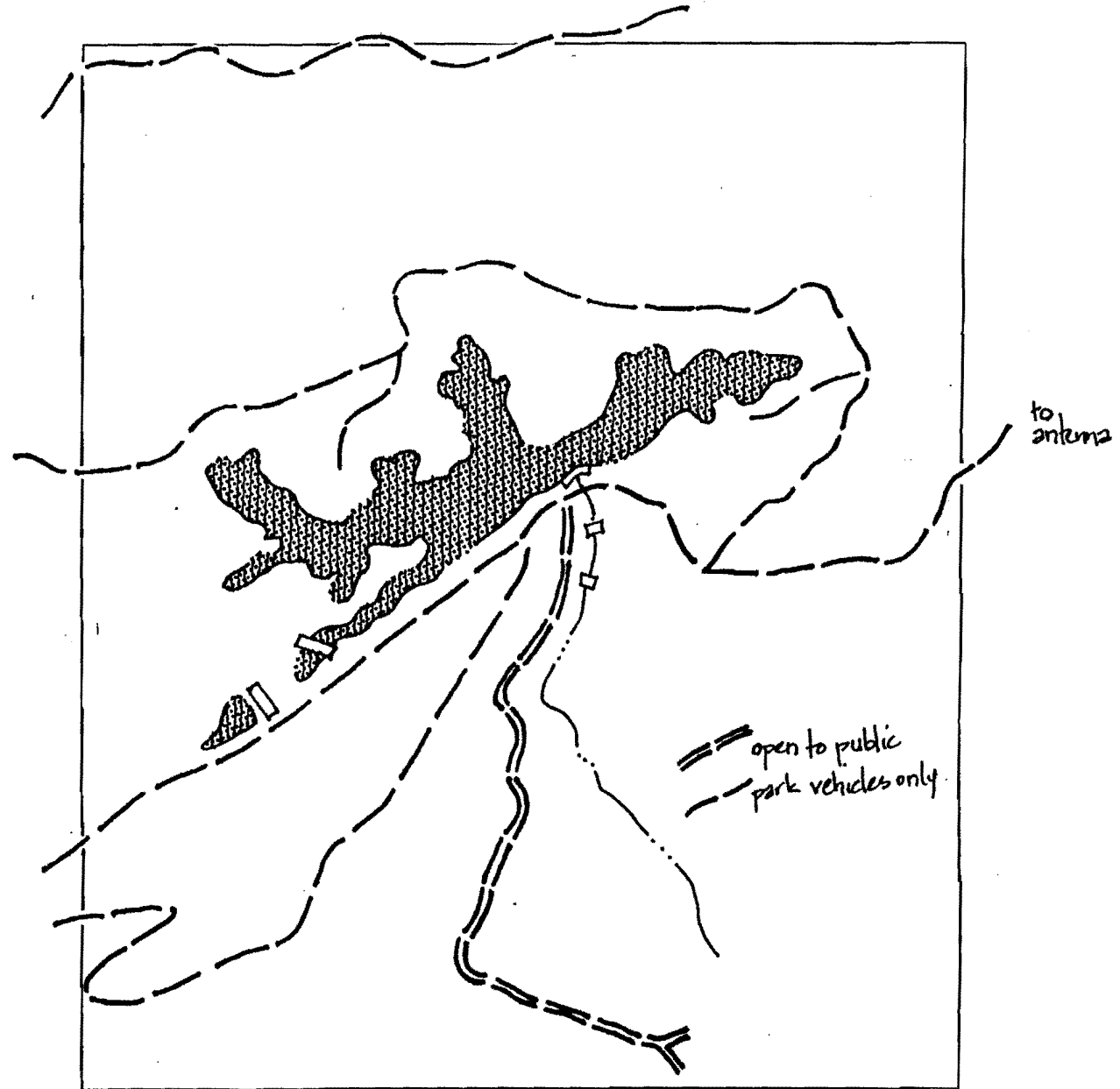
CIRCULATION

VEHICULAR TRAFFIC

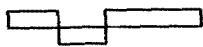
CONDITION:

Public vehicle access is limited to the entry/
exit road and connections to parking.

All other roads are strictly for park personnel
and are gravel.



5.2a



CIRCULATION

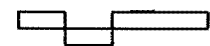
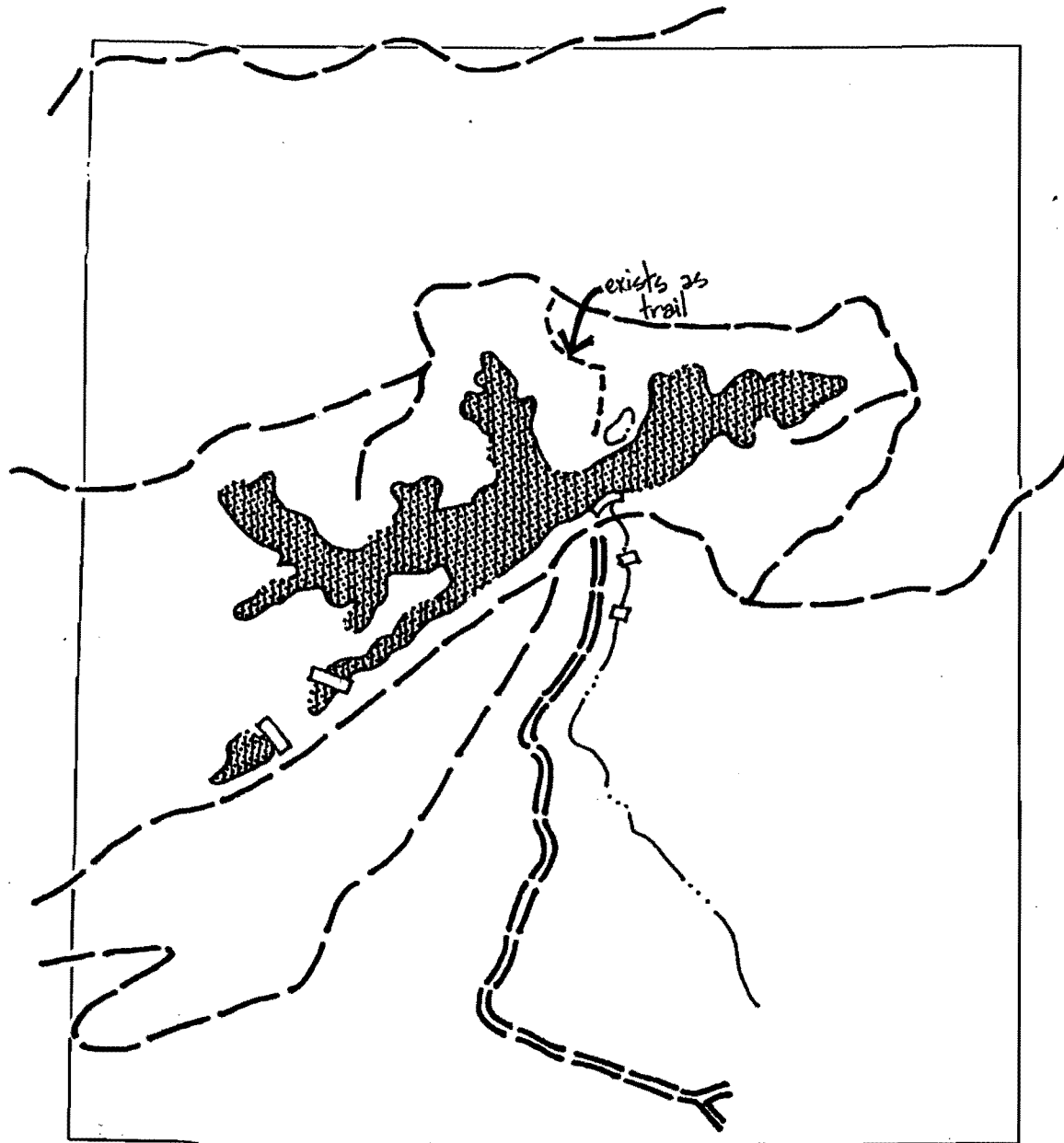
VEHICULAR TRAFFIC

RESPONSE:

Do not increase public vehicular access.

Provide gravel road connecting Lake Road (existing) and new building--for scientists and service vehicles.

Consider using existing trails to accomodate vehicular access to site.



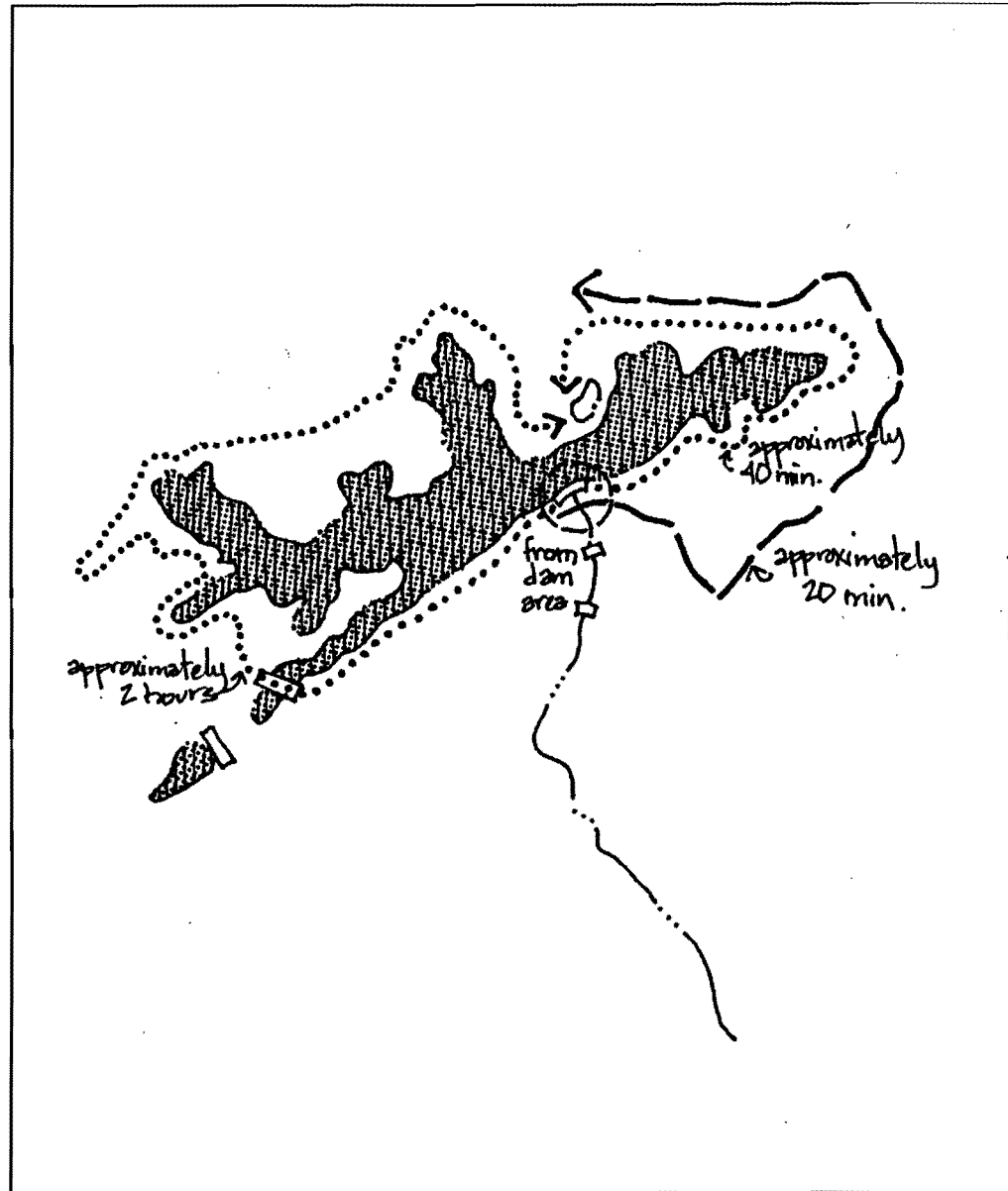
5.2b

CIRCULATION

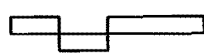
TRAVEL TIMES

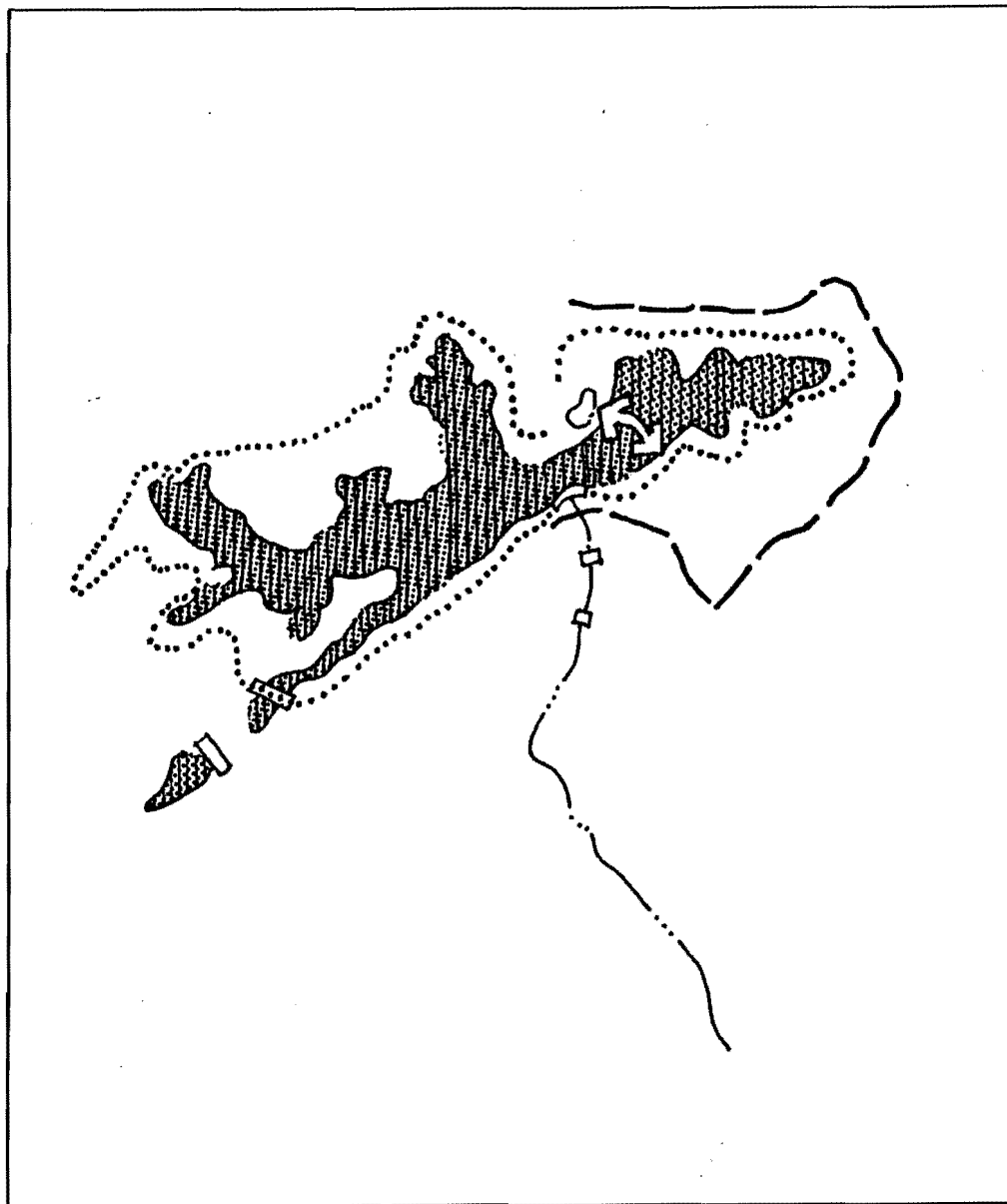
CONDITION:

Building area is not easily accessible.



5.3a





CIRCULATION

TRAVEL TIMES

RESPONSE:

- Provide dock for existing barge so that heavy equipment, large groups of people, or emergencies may be accommodated more efficiently.

UTILITIES

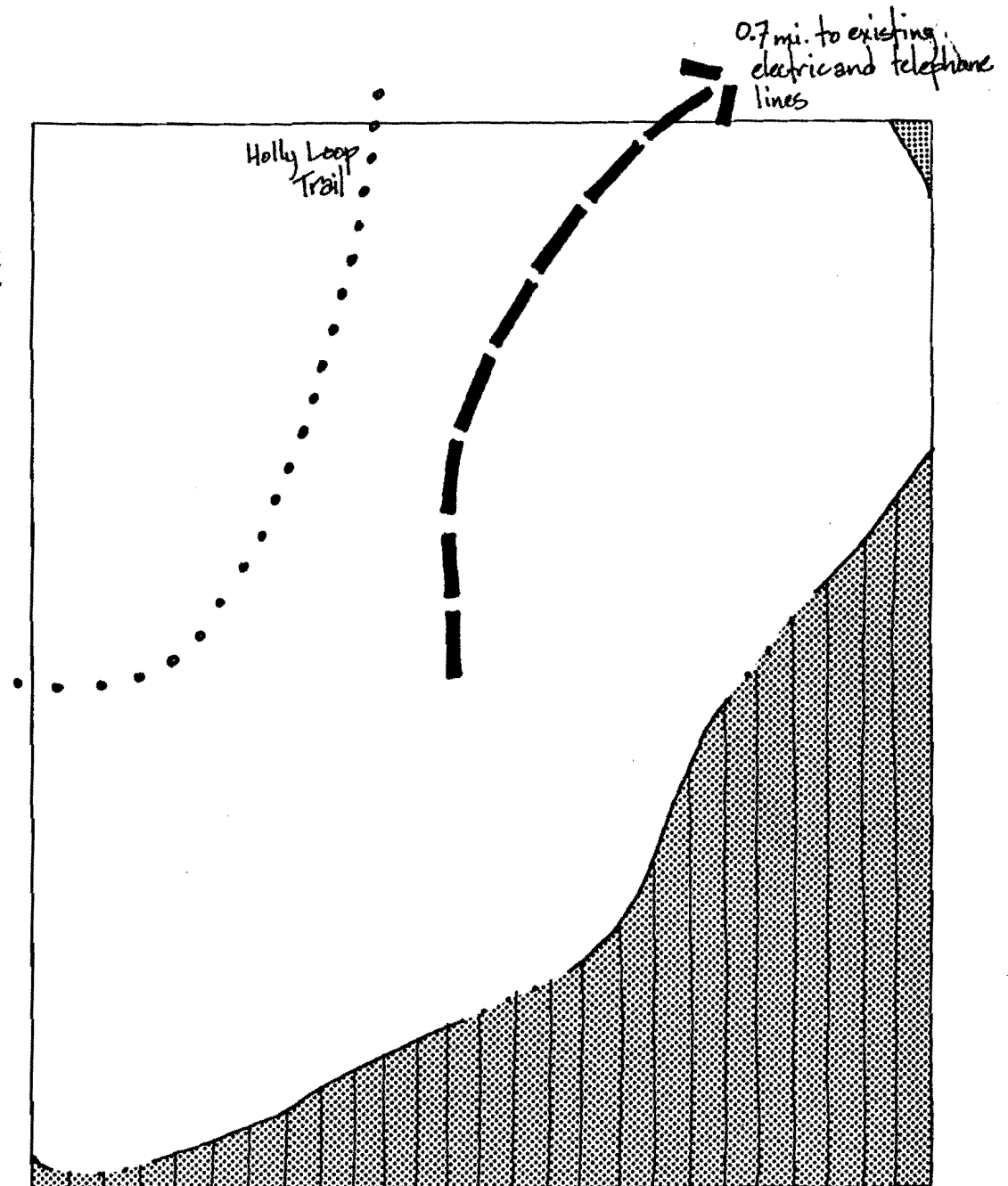
ELECTRICITY/ TELEPHONE

CONDITION:

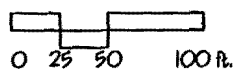
No electric or telephone lines currently exist in or near the building area.

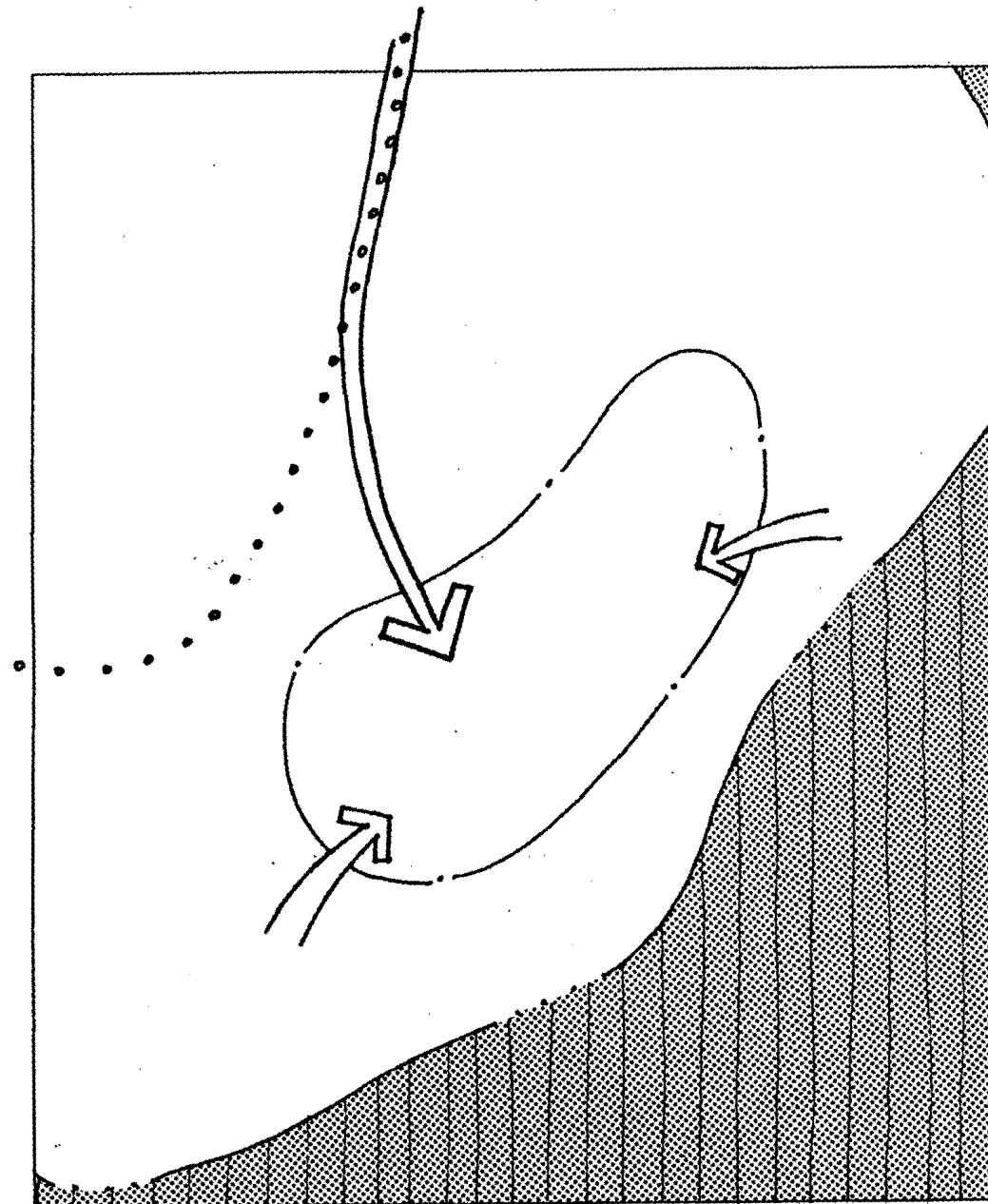
All existing utility lines are underground.

Lines run from city, across mountain, and down Azalea Trail, then branch to service the southeastern side of the lake.



6.1a





UTILITIES

ELECTRICITY/ TELEPHONE

RESPONSE:

Connect to existing lines at eastern edge of lake, where Azalea Trail and Lake Road meet.

Lay new lines under roads or trails to site.

Consider alternative energy sources: solar power, hydroelectricity.

Consider use of "cellular" phone system.



0 25 50 100 ft.

6.16

UTILITIES

SEWER

CONDITION:

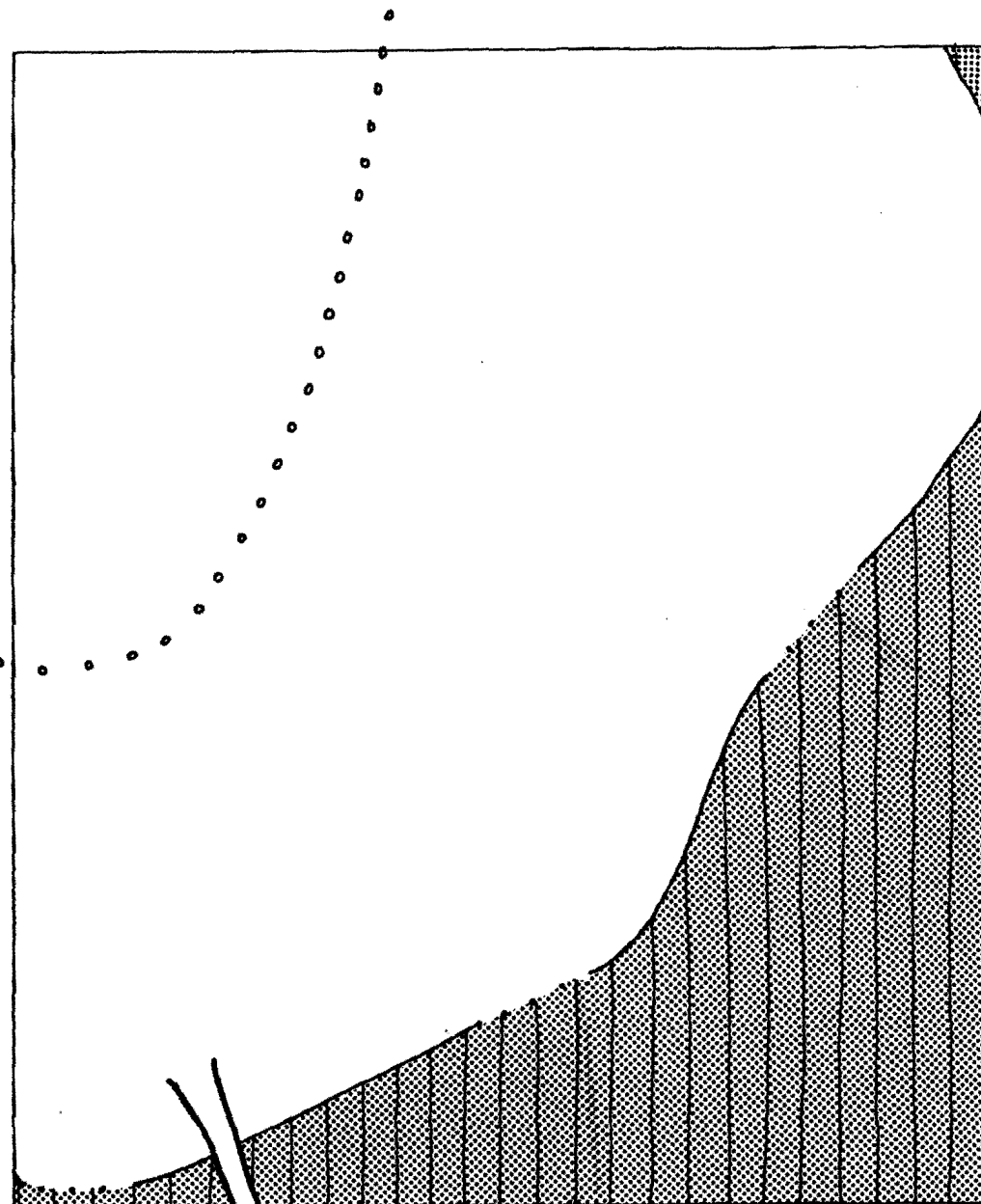
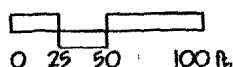
Existing facilities have small underground waste water treatment plant. Liquid wastes are cleaned and recirculated into the environment. Solid wastes are removed monthly.

This system employs no foreign chemicals.

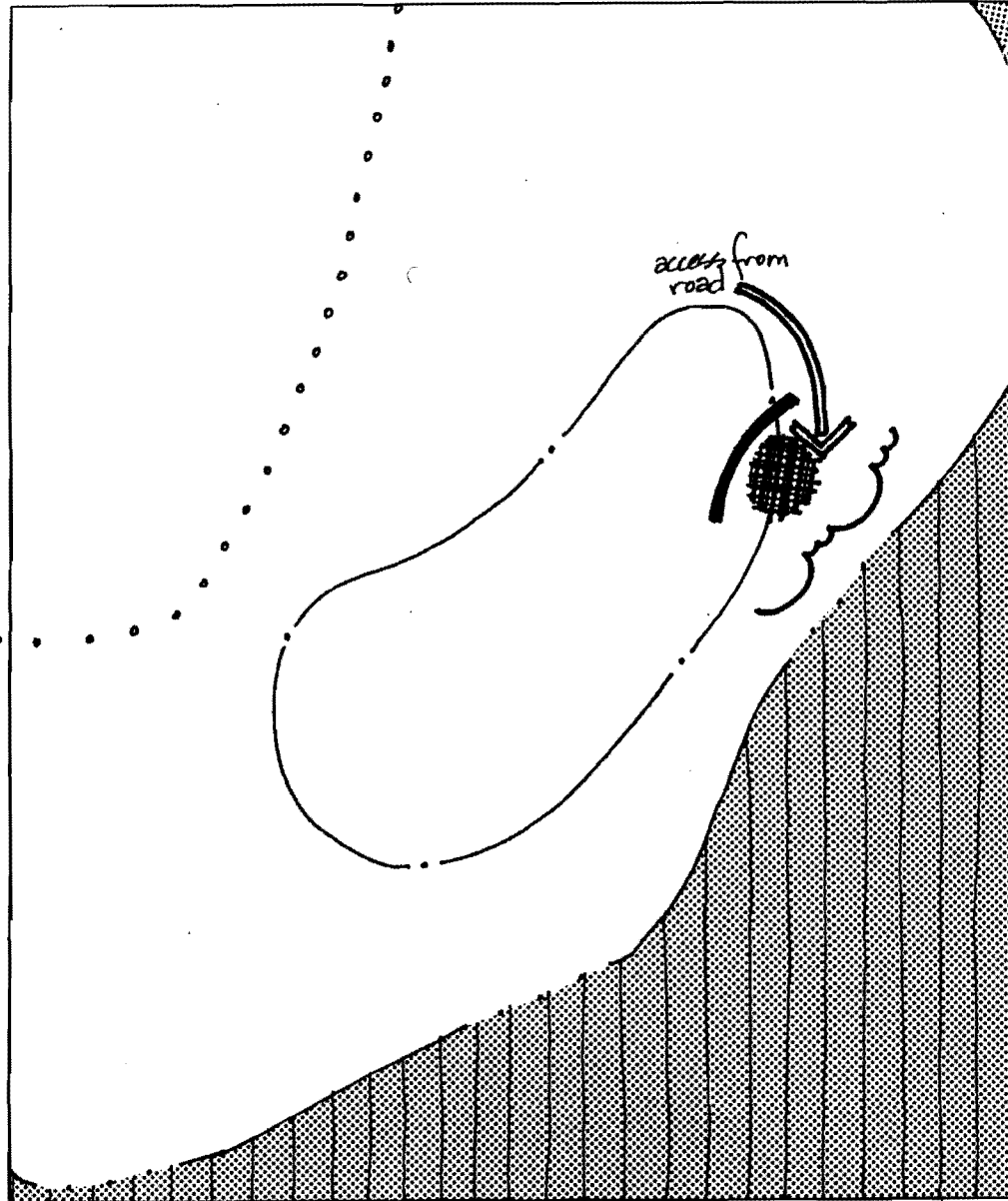
Size and location of existing treatment plant do not permit usage by the new building.



6.2a



existing system:
across reservoir



UTILITIES

SEWER

RESPONSE:

Create a separate system similar to that used by the existing buildings.

Locate treatment area away from new building but maintain easy accessibility.

New system must be at a lower elevation than the building it serves.

Prohibit views of the system from existing trails.

UTILITIES

WATER

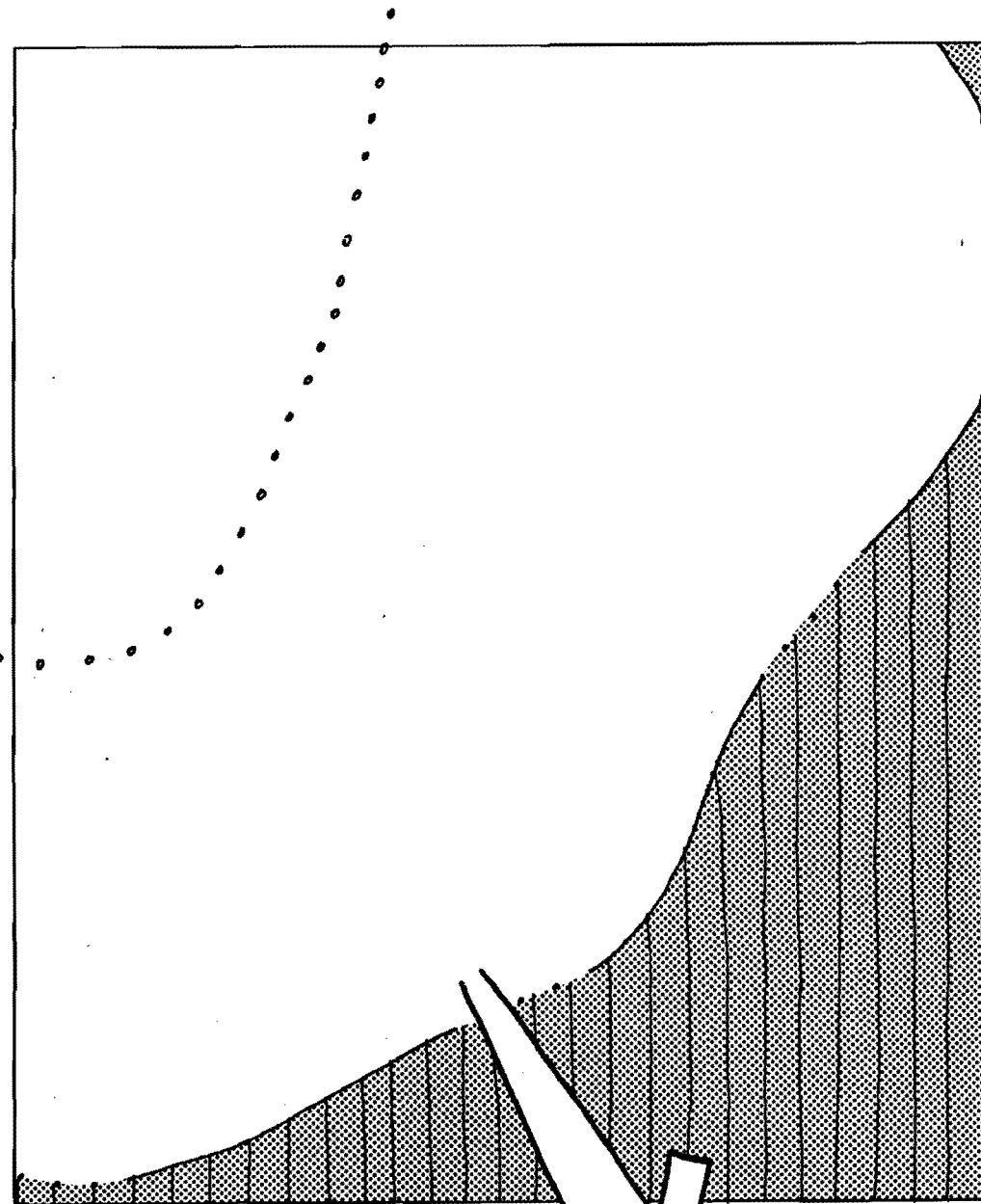
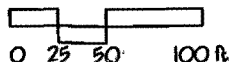
CONDITION:

Existing facilities are supplied with water from within the park.

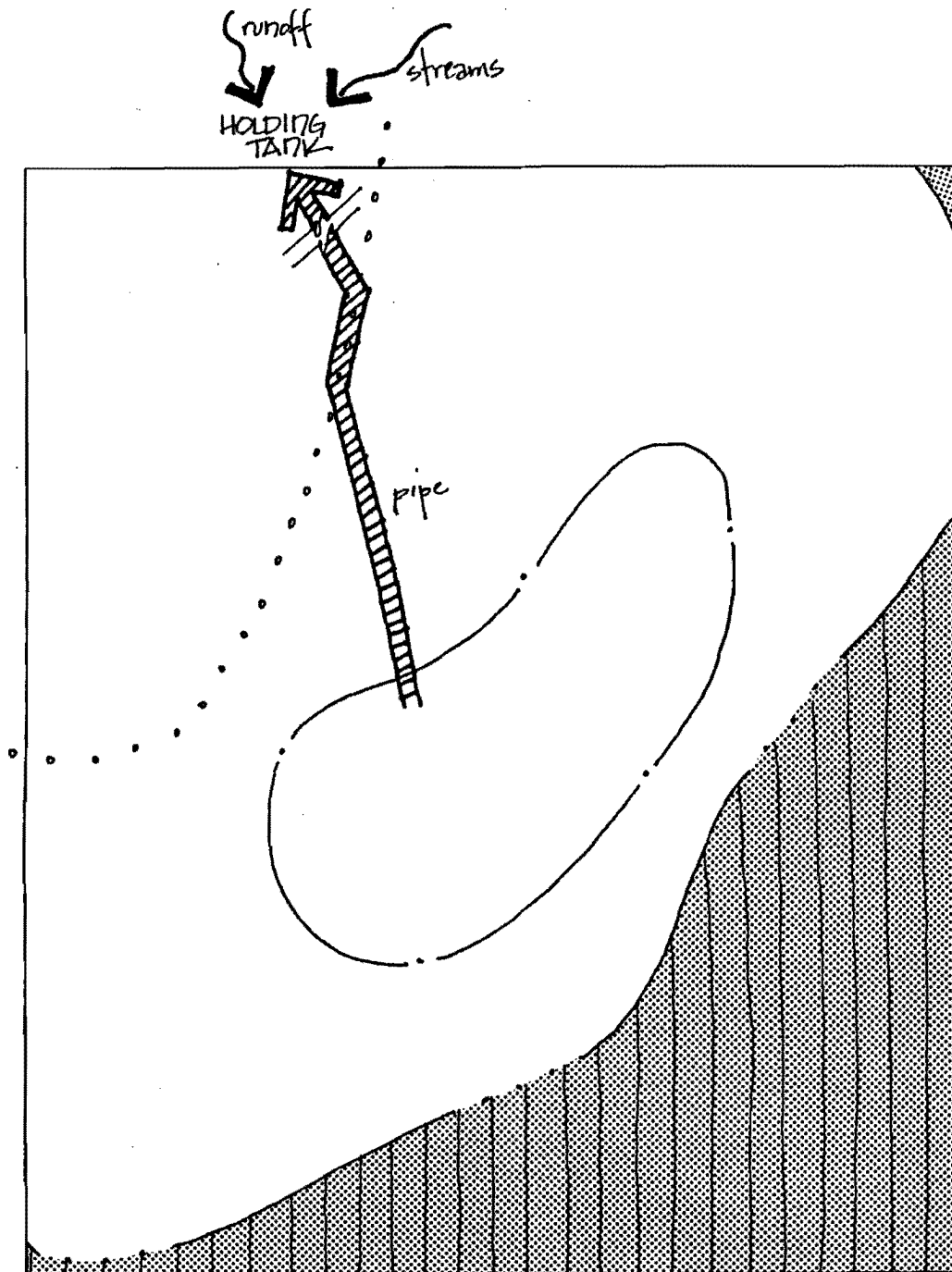
A large tank, situated near the southeastern ridge, collects rainwater and water from small streams.

The geography of the land, distance, and size of the tower do not permit use by the new facility.

6.3a



water tower:
app. 1 mile



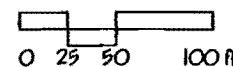
UTILITIES

WATER

RESPONSE:

Collect water from existing streams further up the ridge and pipe it to the site.

Create a holding tank above Lake Road (must be vehicle-accessible).



6.3b

SENSES

VIEWS FROM SITE

CONDITION:

Views to south and east are very good.

Views to north and west are into woods, but not bad.

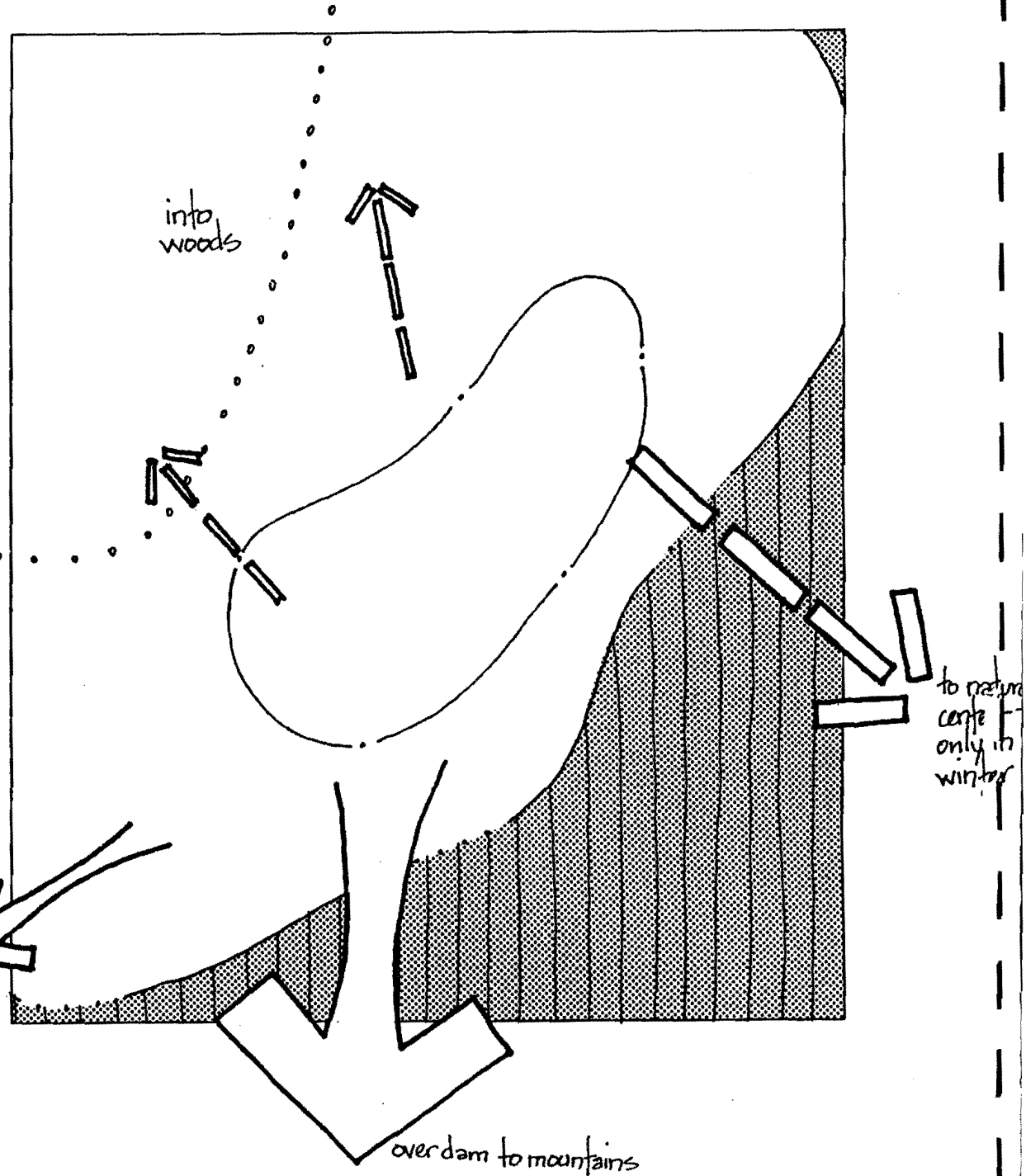
All views are filtered by trees.



onto
and across
lake

7.1a

0 25 50 100 ft.



SENSES

VIEWS FROM SITE

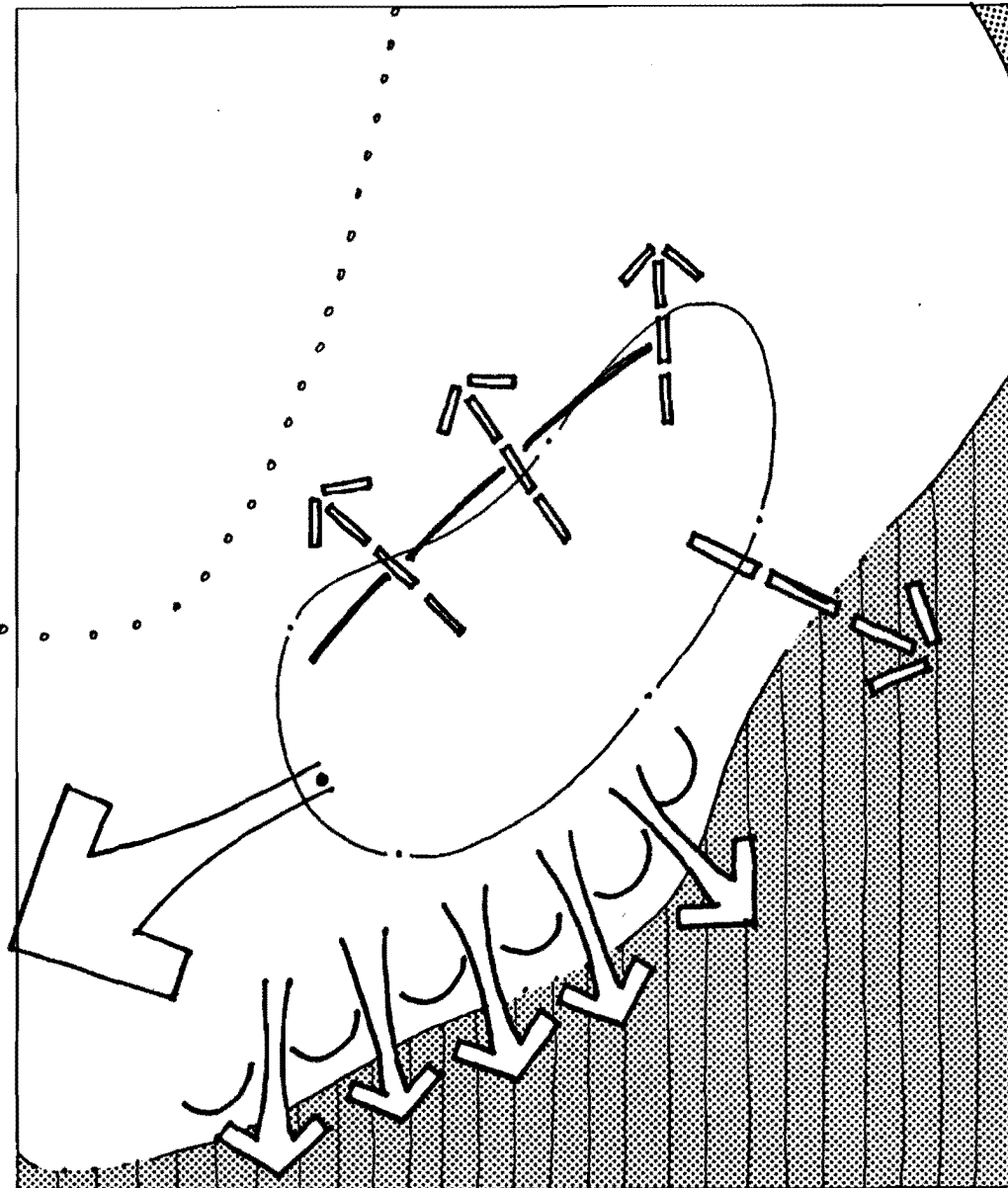
RESPONSE:

"Thin" trees along water's edge to create partial year-round view over dam.

Emphasize winter view to nature center.

Maintain north and west views as program allows, but they are not essential.

Possibly make "observation points" for views across lake.



0 25 50 100 ft.

7.1b

SENSES

VIEWS INTO SITE

CONDITION:

Views into woods are very limited by trees.

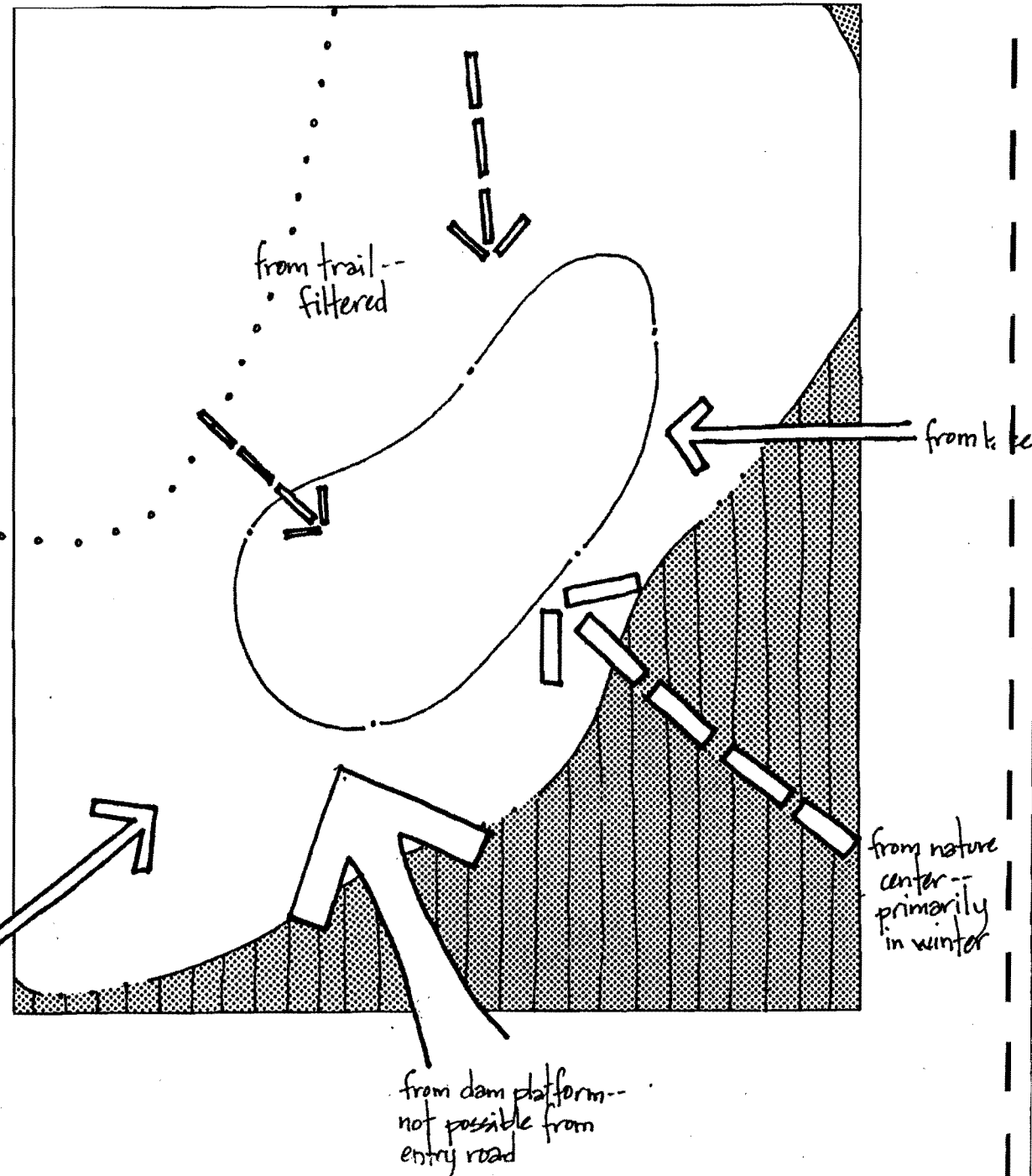
The site is visible from the dam platform, but not from the road below.

A good view from the nature center is possible, primarily in the winter season.



7.2a

0 25 50 100 ft.



SENSES

VIEWS INTO SITE

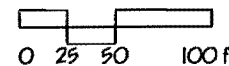
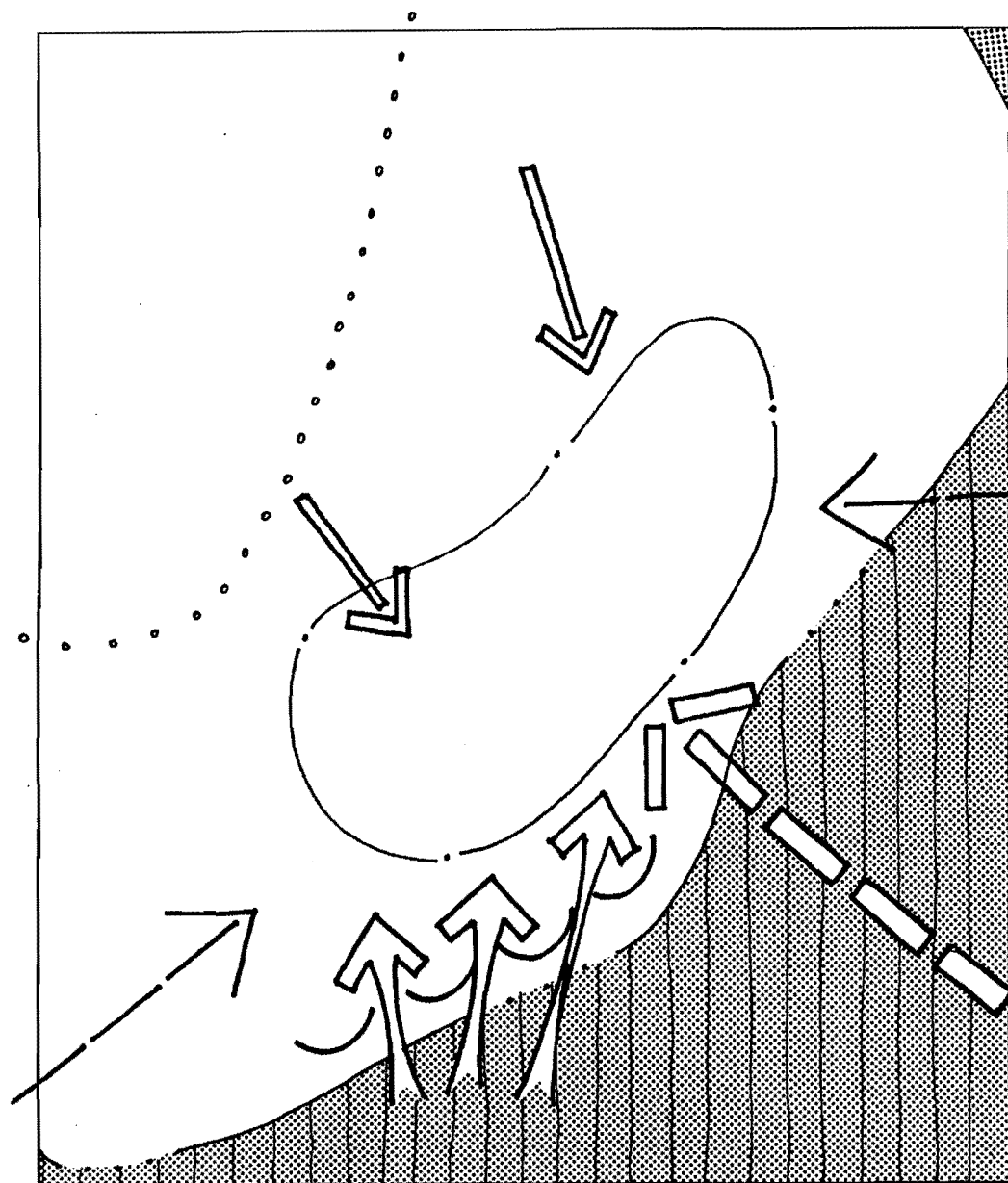
RESPONSE:

Maintain building's "presence" from nearby trails.

Ensure at least a partial view of the building from the dam platform.

Lake views are of secondary importance.

The building is an "object" for winter viewing from the nature center.



7.2E

SENSES

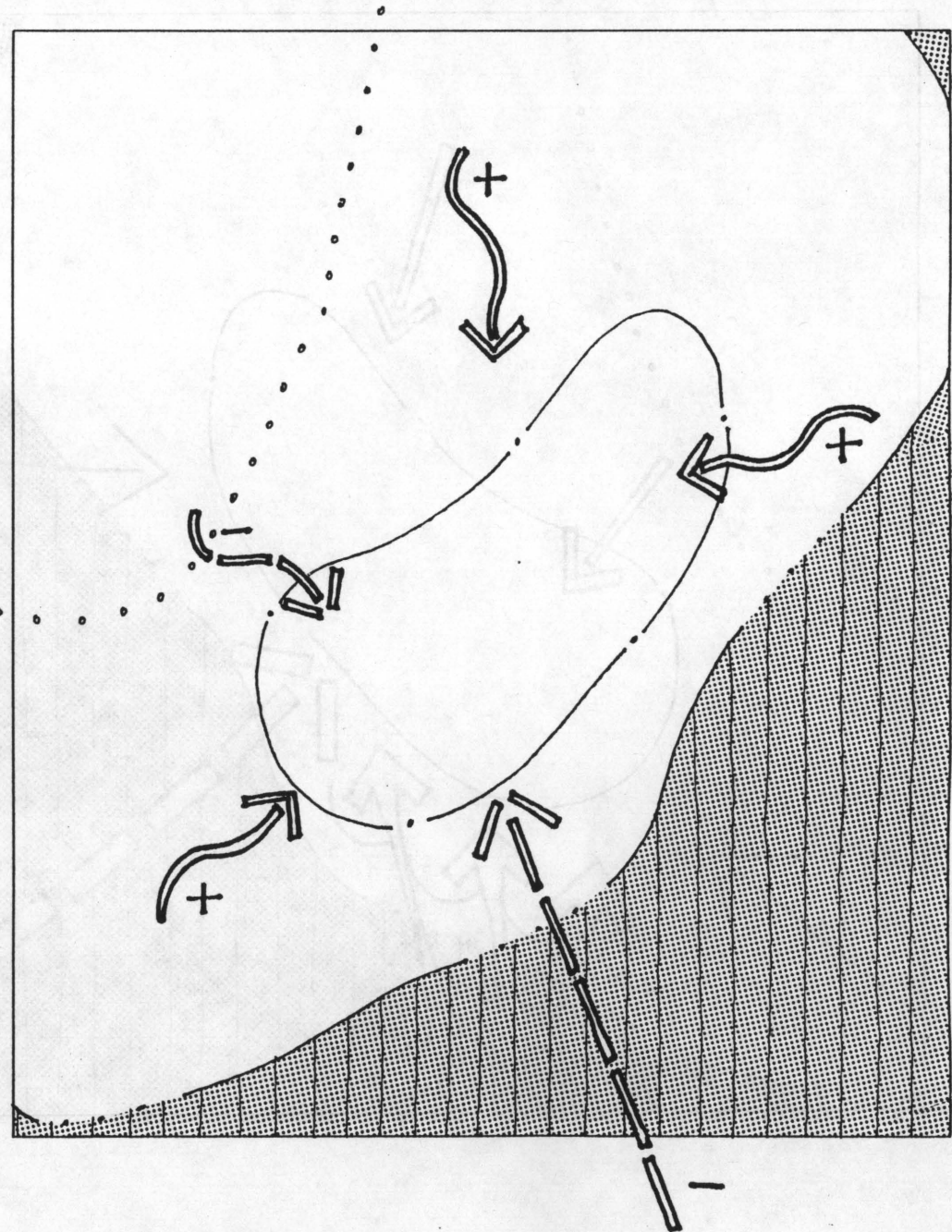
NOISE / SOUND

CONDITION:

Sounds of animals, nature filter through trees.

There is the potential for noise from vehicles entering the park.

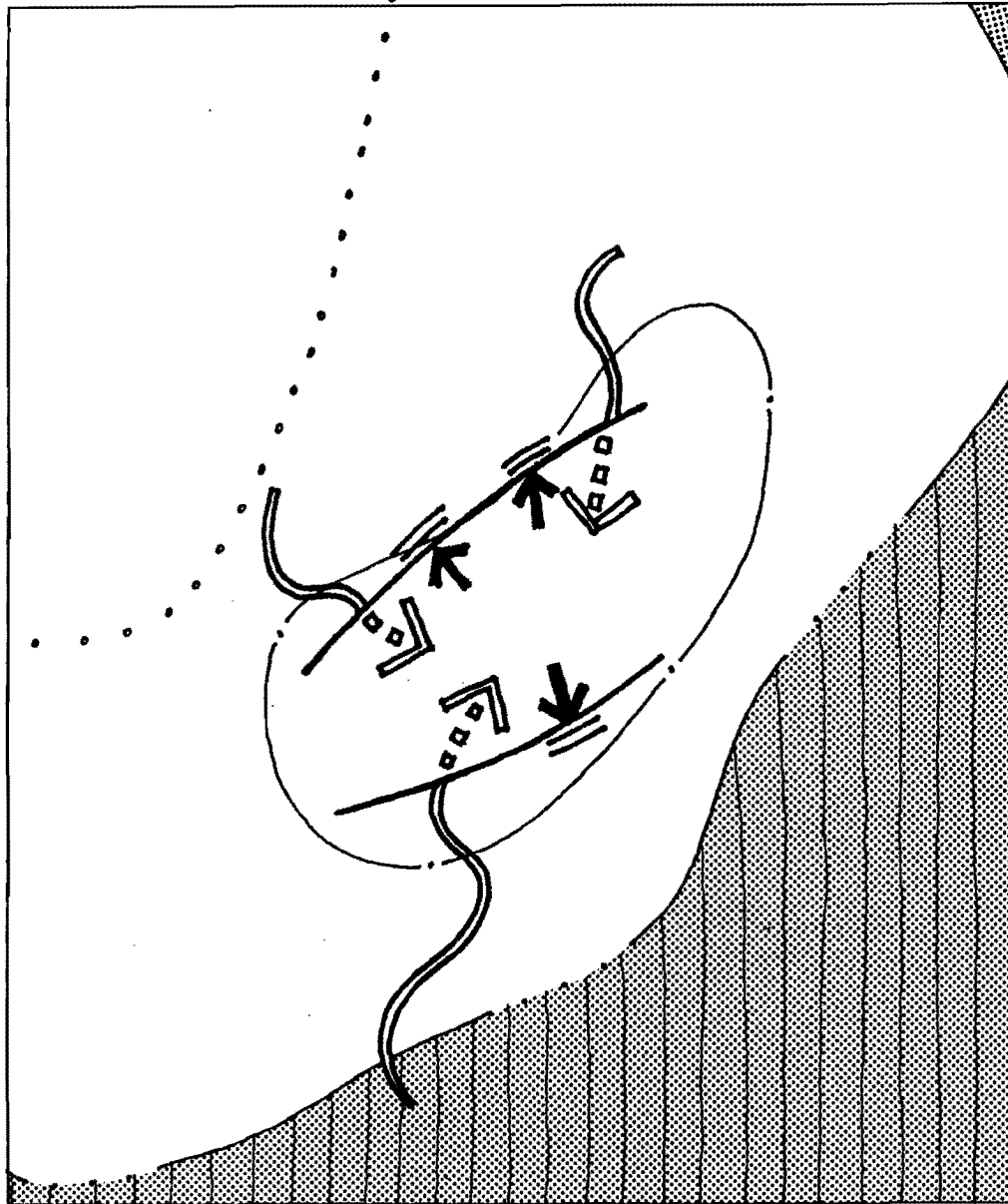
Very occasional noise from hikers may also reach the building site.



7.3a

0 25 50 100 ft.





SENSES

NOISE / SOUND

RESPONSE:

Allow natural sounds to "filter" through walls as they do through trees.

Vehicular noise is inconsequential.

Keep noise escaping from building to a minimum.

CLIMATE

TEMPERATURE¹

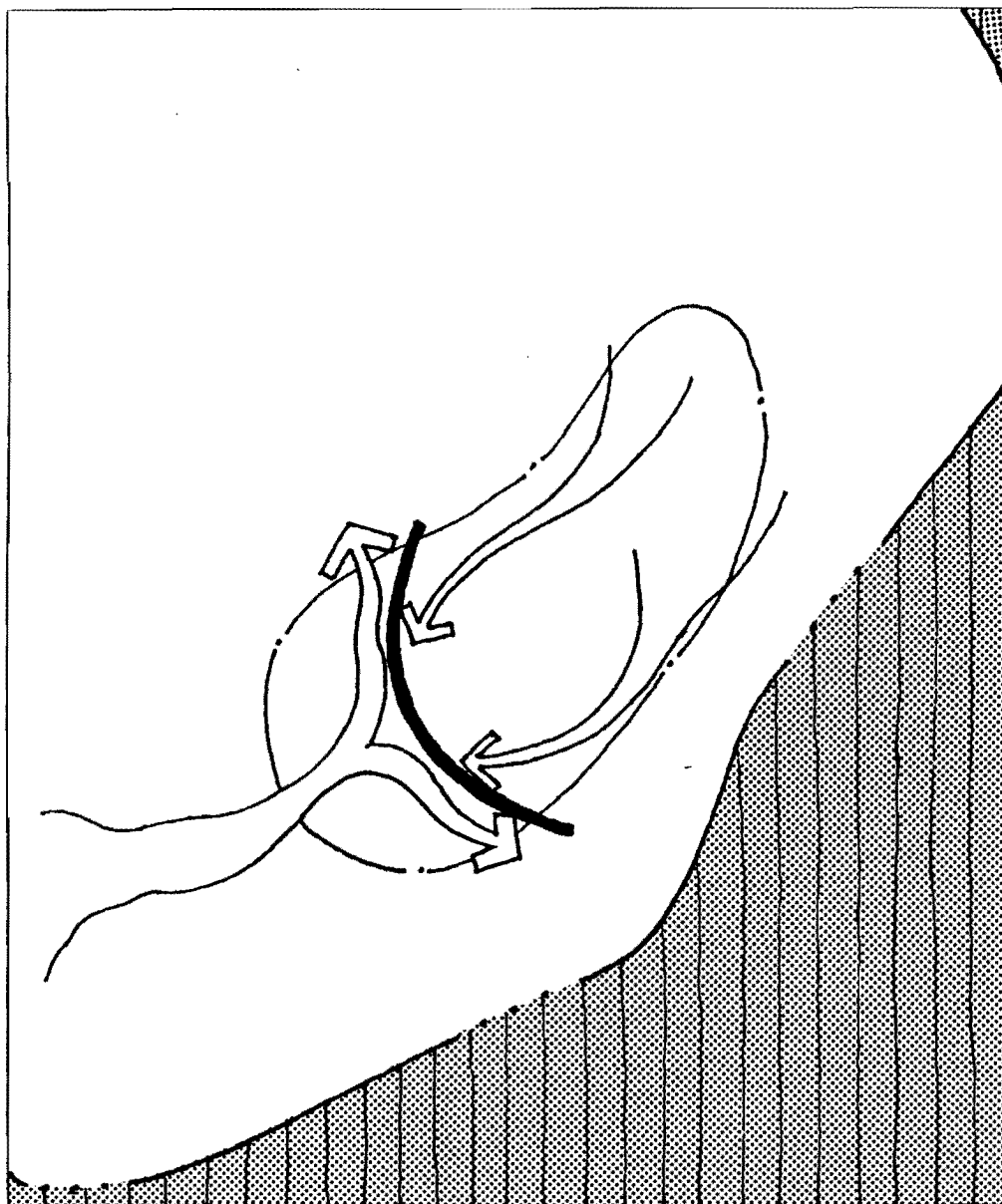
CONDITION:

20 degree day/ night temperature fluctuations are common.

Average monthly temperatures are rarely below freezing.

Amount of heating needed is much greater than amount of cooling.

	JAN	APR	JULY	OCT
AVG. TEMP.				
DAILY MAX.	43.7	67.4	84.6	69.1
DAILY MIN.	24.3	43	64.1	44.2
MONTHLY	34	55.2	74.4	56.7
DEGREE DAYS				
HEATING	961	298	0	280
COOLING	0	0	291	23



CLIMATE

WINDS

RESPONSE:

Orient building to catch cooling winds of summer months and repel frigid winds of winter months.



0 25 50 100 ft.

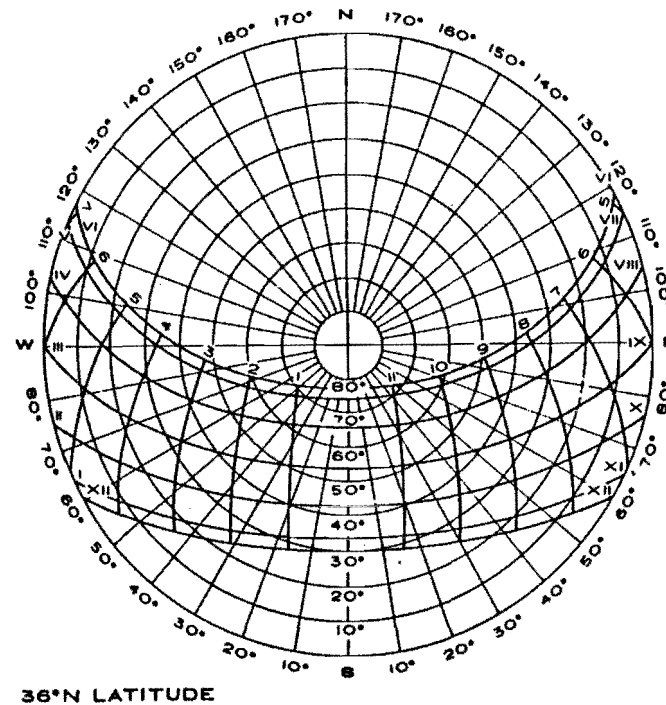
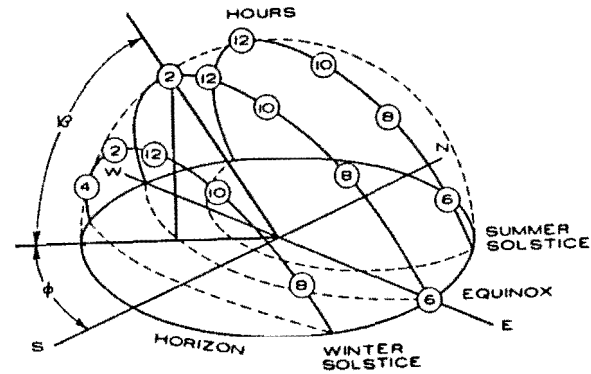
8.2b

CLIMATE

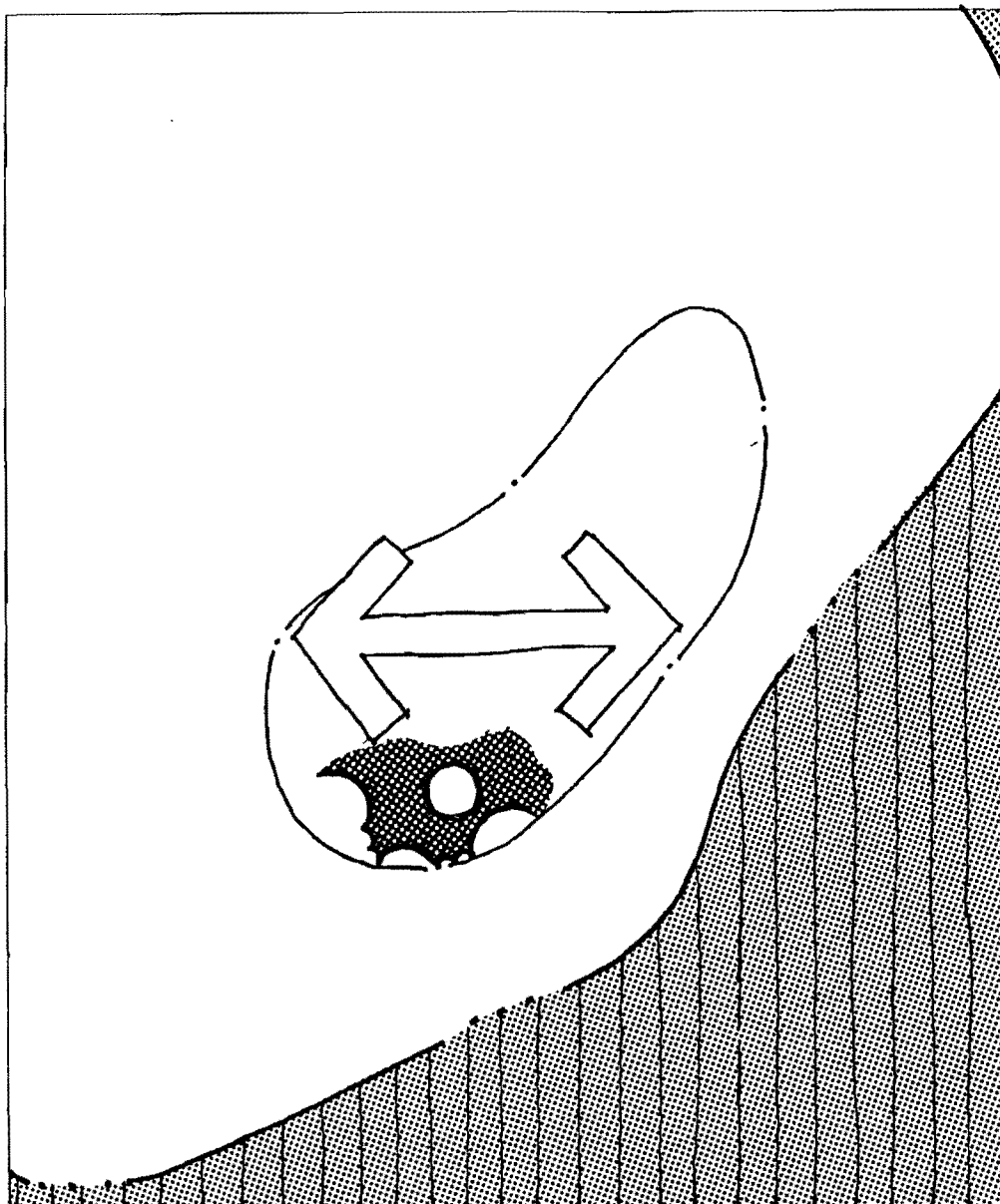
SUN PATH²

CONDITION:

Sun's azimuth is at approximately 30 degrees in winter but 82 degrees in summer.



36°N LATITUDE



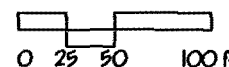
CLIMATE

SUN PATH

RESPONSE:

Orient building along east-west axis to expose maximum surface area to the southern winter sun.

Consider means of shading building from summer sun, including porches or deciduous trees.



8.3b

SITE ANALYSIS

Several conclusions can be drawn from this analysis:

The site for the building is well-chosen. There are no *physical* deterrents or insurmountable obstacles to building here, although it may be difficult to access.

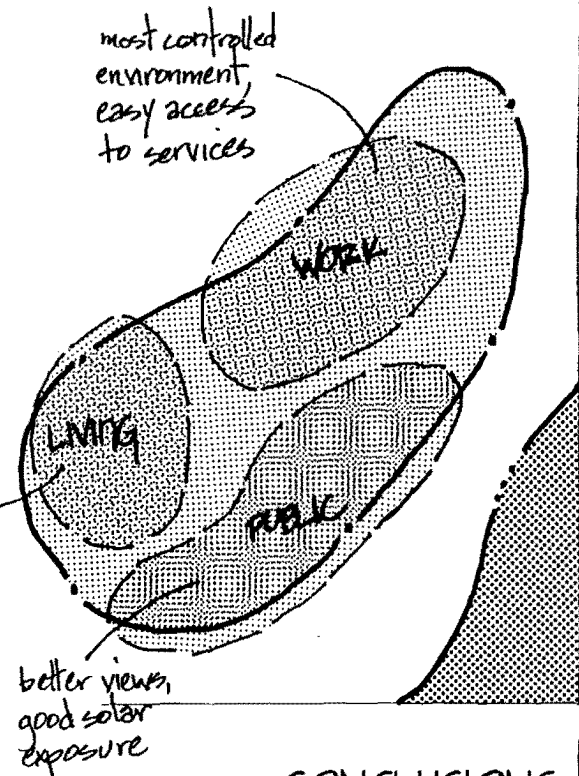
There is high potential for a "landmark" sort of building rather than a building hidden in the landscape.

The greatest concern about the site is the impact construction will have on the environment, especially the animal life.

The building should be pleasant to look *at* and to look *from*. It should be an ideal place to work: quiet and well-lit.

This is a temperate climate, which necessitates mechanical heating *and* cooling. This fact does, however, create variety in the landscape, especially seasonal variety, and thus improves the views.

more privacy,
good connection
with woods



CONCLUSIONS

Tell me to what you pay attention, and I will tell you who you are.
—Jose Ortega Y Gasset¹

ISSUE ANALYSIS

CONTEXT

- 1.1 NATIONAL WILDFLOWER RESEARCH CENTER
- 1.2 CENTER FOR BIOTECHNOLOGY AND BIOENGINEERING
- 1.3 ARCHERY FACILITIES
- 1.4 VAN ZANDT HOUSE

ENVIRONMENT

- 2.1 CENTER FOR ENERGY AND ENVIRONMENTAL EDUCATION
- 2.2 NATIONAL WILDFLOWER RESEARCH CENTER
- 2.3 ARCHERY FACILITIES
- 2.4 SAINSBURY CENTRE FOR VISUAL ARTS
- 2.5 TECHNOLOGY

COMMUNICATION

- 3.1 BIOMEDICAL INFORMATION COMMUNICATION CENTER
- 3.2 ART+ARCHITECTURE BUILDING
- 3.3 COOLEY SCIENCE CENTER

LABORATORIES

- 4.1 RICHARDS MEDICAL RESEARCH CENTER
- 4.2 IOWA ADVANCED TECHNOLOGY LABORATORIES
- 4.3 WESTVACO FOREST SCIENCE CENTER
- 4.4 ROCKY MOUNTAIN INSTITUTE RESEARCH CENTER

INDEX

CONTEXT

We should note that most built forms--When informed by local geologic and material conditions along with society's traditions and the communal trust--tend to preserve and reinforce their meaning in time and remain as physical documents of the causes that created them.

--Giuseppe Zambonini¹

As with many words, the stated definition for context does little to truly inform its meaning. Establishing context is more than responding to site, more than mimicking nearby built or natural forms. At its essence, architectural context infers a phenomenological sense that a built environment "fits" in its place, that it is neither sitting *on* the landscape nor swallowed *by* the landscape, but that it interacts with its setting in a continual dialogue. This issue takes on special significance in a facility designed for the study of that landscape and its inhabitants.

The following studies respond to the site at many levels beyond those discovered in a traditional site analysis, many of which are difficult to record. They transcend the attitude that the landscape is precious, not to be intruded upon or contradicted; instead, each of these cases "grows out of the site, responding to the hillside, never to be part of nature but to live in symbiosis with it," as was said about Miralles Pinos' Archery Facilities.²

Other informers: Alvar Aalto's Mäirea House³
Antoine Predock's Rio Grande Nature Center⁴
James Cutler's Virginia Merrill Bloedel Education Center⁵
Bohlin Cywinski Jackson's House in the Adirondacks⁶
Jersey Devil's House in La Honda, California⁷

con-text (n) the interrelated conditions in which something exists or occurs

CONTEXT

NATIONAL WILDFLOWER RESEARCH CENTER⁸

Austin, Texas
Overland Partners

MATERIALS

Stone walls, metal roofs, and overhangs are common to built forms of this area.

Stonework was very common in South Texan past. Limestone and sandstone are available locally.

VEGETATION

Courtyards and the aquatic garden are filled with plants native to South Texas.

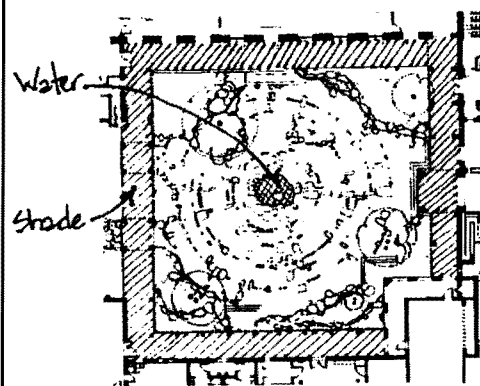
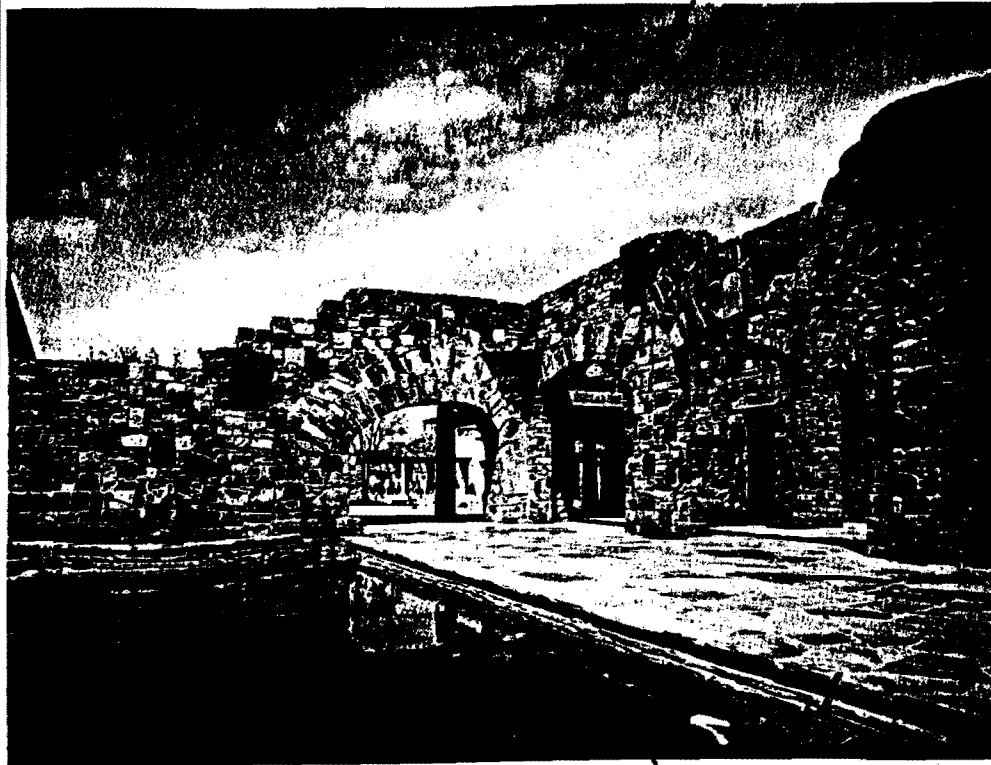


MAIN PLAZA

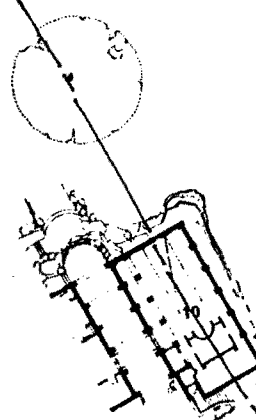
CONTEXT

NATIONAL WILDFLOWER RESEARCH CENTER

Austin, Texas
Overland Partners



MAIN PLAZA



LIBRARY

HISTORY

Arched walls are reminiscent of ruined missions in the area and in all of Texas.

Combination of plaza, water, and shade are inherent to architecture of this region.

CONNECTION

System of cisterns, aqueducts, and canals literally bind the buildings to the landscape and to each other.

Research library is intentionally on axis with native cedar elm.

CONTEXT

CENTER FOR BIOTECHNOLOGY AND BIOENGINEERING⁹

Pittsburg, Pennsylvania
Bohlin Cywinski Jackson

TOPOGRAPHY

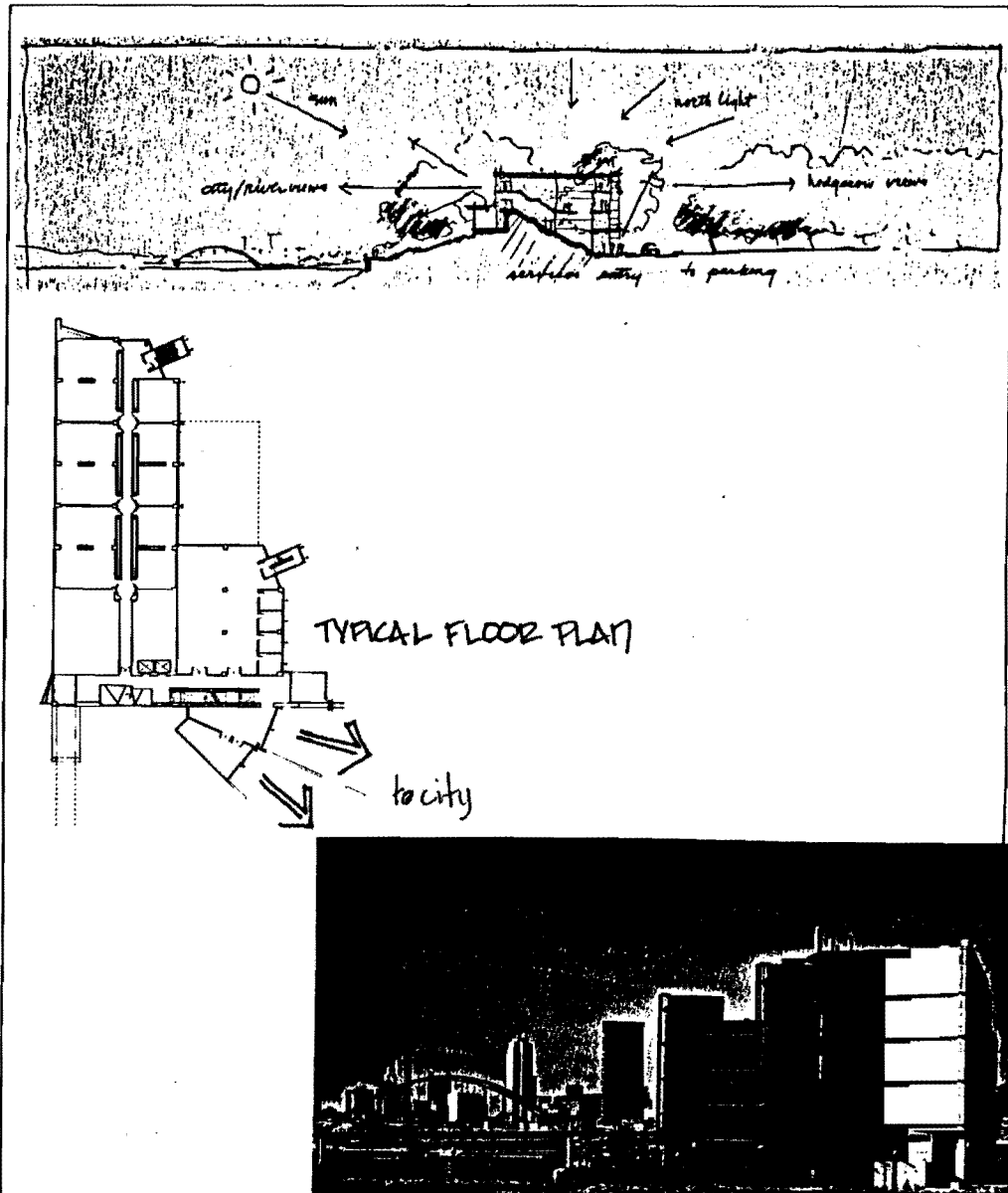
Building uses land forms to emphasize good views and maximize natural lighting.

VIEWS

Semi-public spaces (Conference room and terrace) are rotated from grid to frame views toward the city.

HISTORY

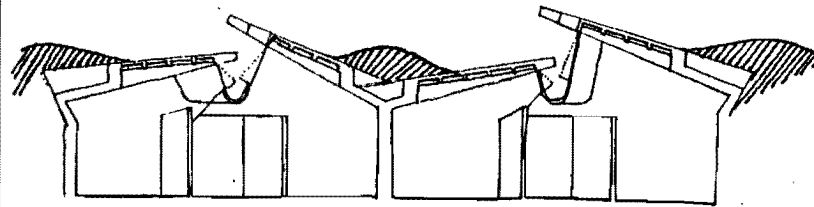
Use of steel and other metals harkens back to Pittsburg's steel-manufacturing heritage.



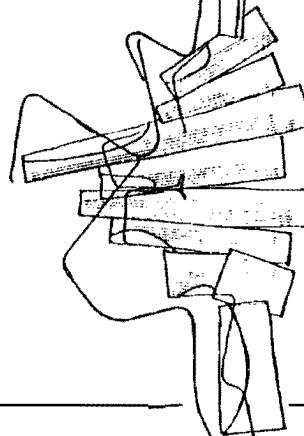
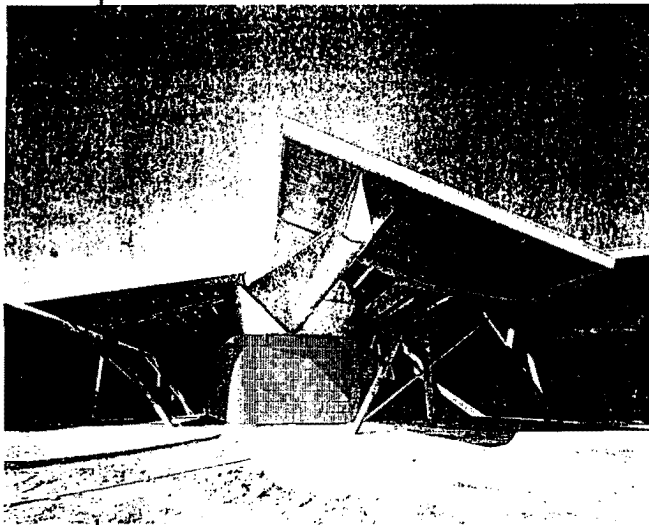
CONTEXT

ARCHERY FACILITIES¹⁰

Vall d'Hebron, Spain
Miralles Pinós



section through dressing rooms



Roof Plan

TOPOGRAPHY

Earth is sculpted around and over the building to obscure or emphasize views.

Continuity of building and landscape blurs the division between natural and man-made.

HISTORY

Comparisons have been made to Andalusian gypsy cave dwellings as well as parts of Guell Park by Gaudi.

CONTEXT

VAN ZANDT HOUSE"

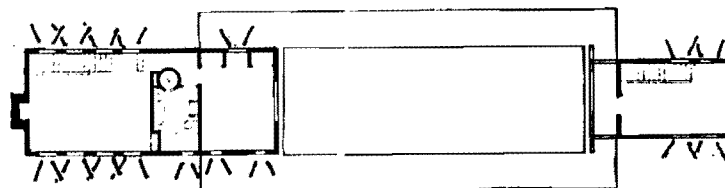
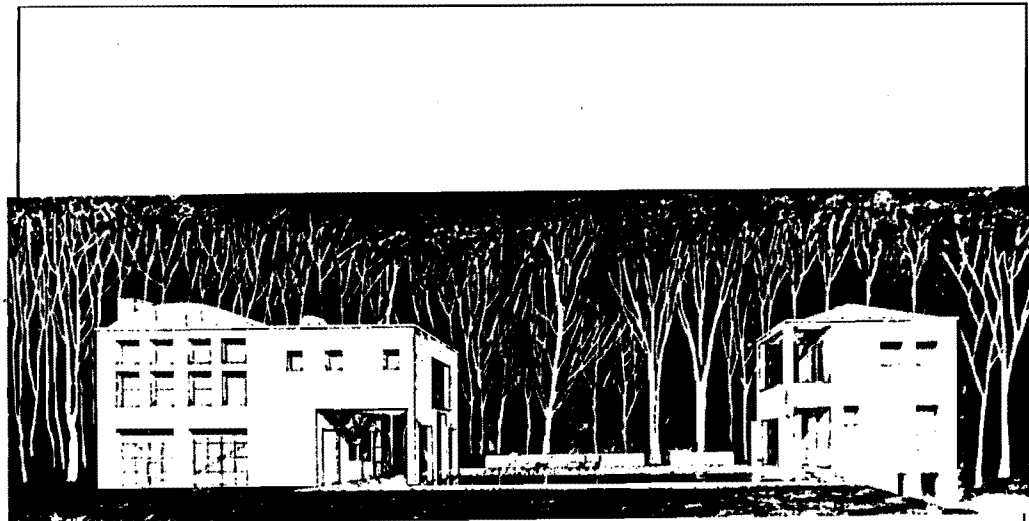
East Hampton, New Jersey
Steven Holl

VEGETATION

The multitude of old trees near the complex is reflected in the pool. The separate structures suggest a frame for viewing the forest beyond.

VIEWS

Windows are situated on the north and south facades to take advantage of many different views into the trees.



UPPER LEVEL PLAN



ENVIRONMENT

The land appeals for care and we need to become friends with the landscape and not be threatened by it.

--Glenn Murcutt¹²

The state of this site as a *nature preserve* automatically implies the need for the environment to be "preserved." But the definition of preservation has, in the past few decades, come to mean much more than simply planting trees. This project seeks to explore preservation, conservation, and sustainability as it applies to architecture. Because any new construction impacts the environment at a global level, the design thereof must consider how each decision affects not only the immediate site, but also the "site" of human existence--our earth. This is not to say that the state of nature should supersede an individual's needs but rather that such an individual must plan for future needs (his and the population's) as well as present needs.

These studies illustrate means of serving a building's inhabitants with minimal negative impact on the environment--from disruption of site patterns to the manufacture of materials to the conservation of natural resources. Following is technological data on equipment or processes which assist in this "preservation" of the environment.

Other informers: William McDonough and Partners' Heinz Family Office and Foundation¹³

Short Ford and Associates' Queen's Building¹⁴

Glenn Murcutt's Marika House¹⁵

Virginia Kent Davis' article "Land Stewardship"¹⁶

en-vi-ron-ment (n) the complex of physical, chemical, and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival

ENVIRONMENT

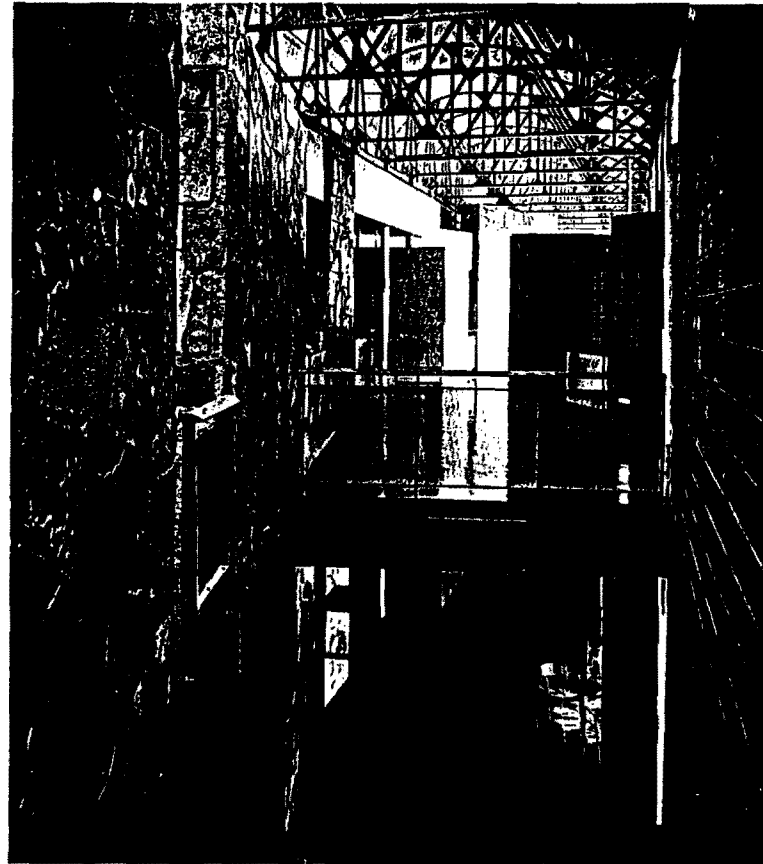
CENTER FOR ENERGY AND ENVIRONMENTAL EDUCATION¹⁷

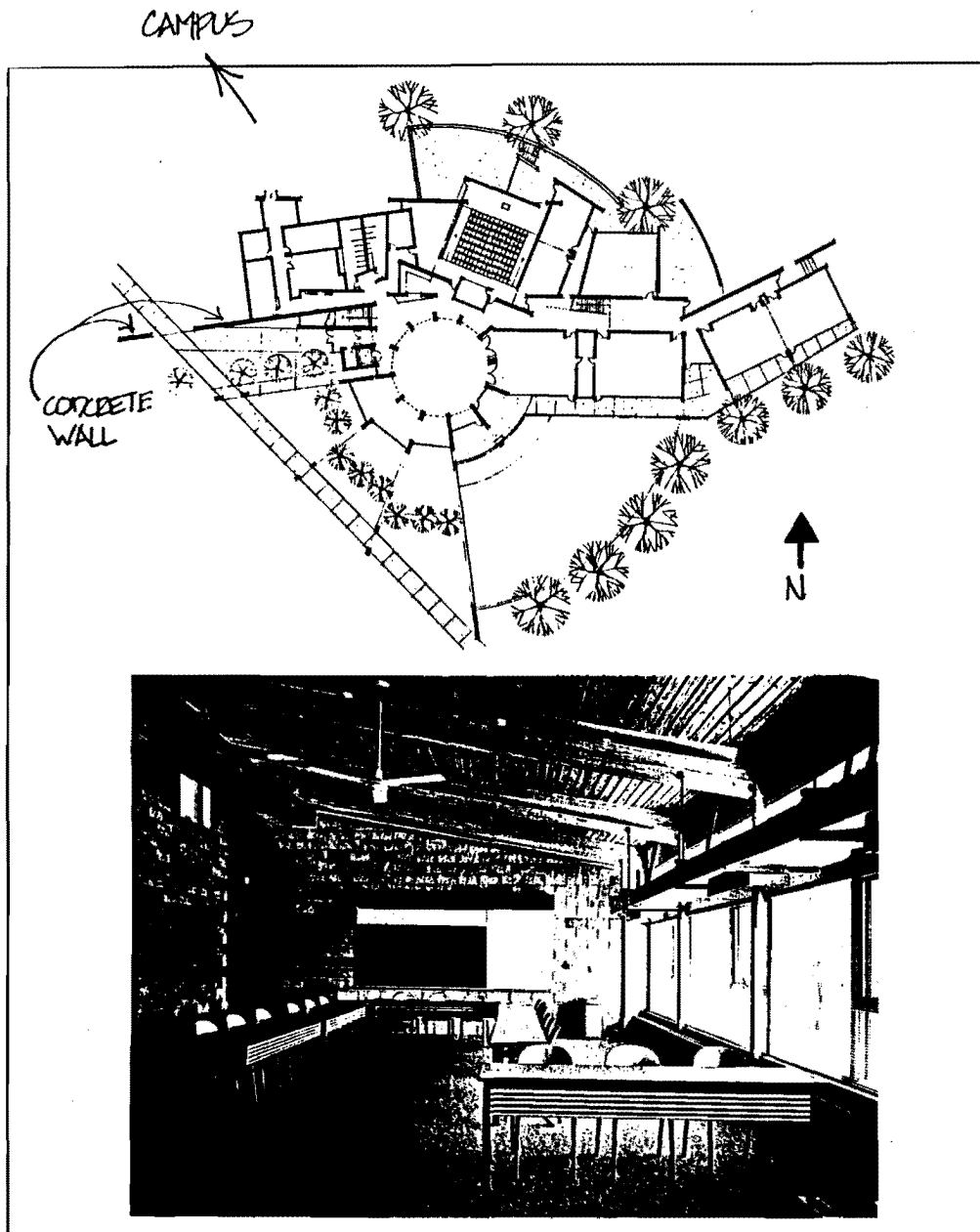
Cedar Falls, Iowa
Wells Woodburn O'Neil

MATERIALS

Unfinished limestone, brick, concrete block, copper, and wood are used because they require low amounts of energy to manufacture.

Recycled materials are used, when possible, on interiors, specifically, insulation and drywall panels.





ENVIRONMENT

CENTER FOR ENERGY AND ENVIRONMENTAL EDUCATION

Cedar Falls, Iowa
Wells Woodburn O'Neil

LIGHTING

South-facing spaces feature extensive glazing to maximize daylighting.

Rooms have light-sensitive sensors that adjust artificial light depending on amount of daylight.

PASSIVE HEATING

Building is sited to maximize solar radiation.

Two-story limestone wall serves as "thermal sink," storing heat in the day and releasing it after dark.

Concrete floors are left exposed to allow slabs to store solar heat.

ENVIRONMENT

NATIONAL WILDFLOWER RESEARCH CENTER¹⁸

Austin, Texas
Overland Partners

DRAINAGE

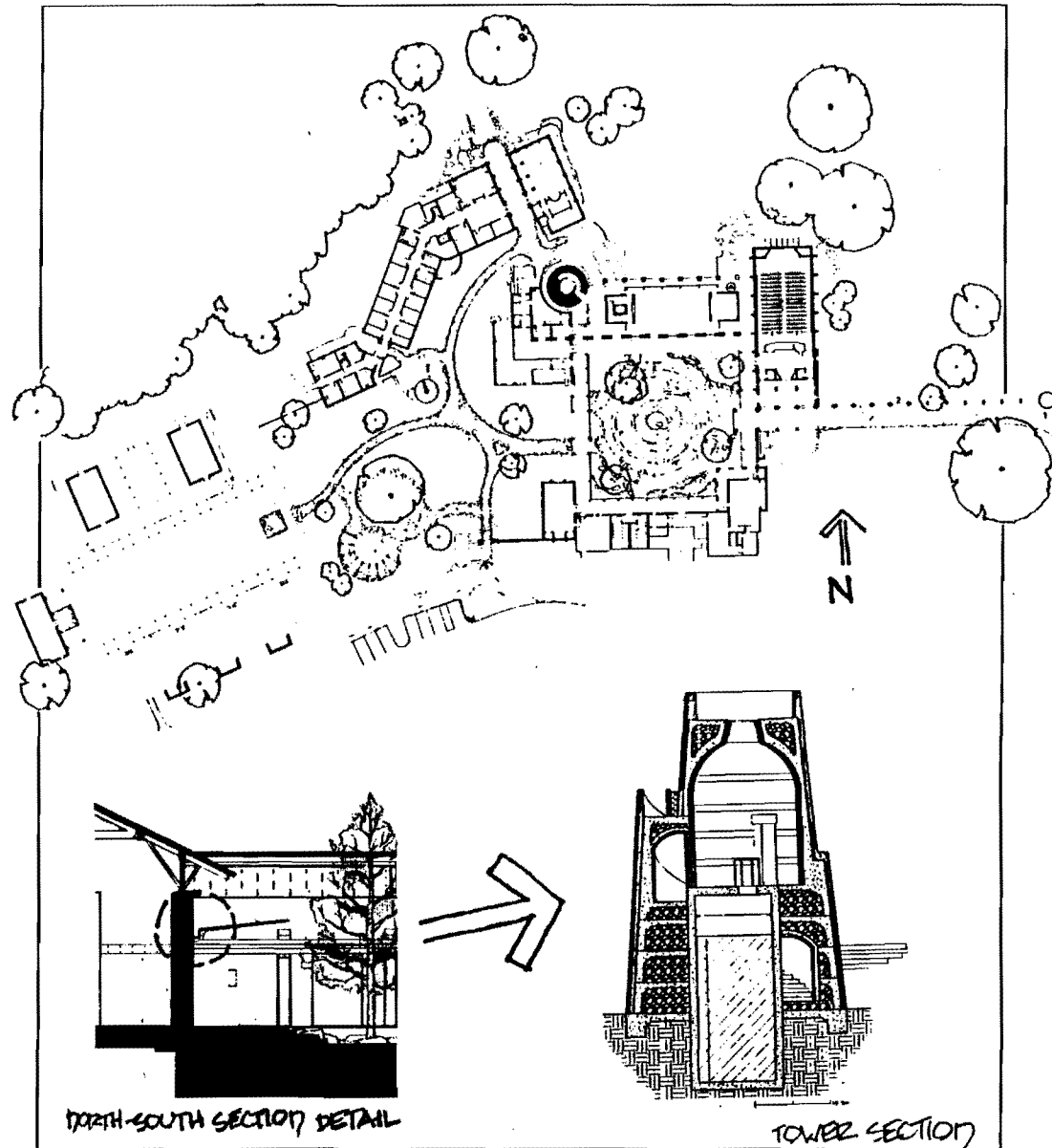
Functions are housed in separate buildings to reduce impact on land.

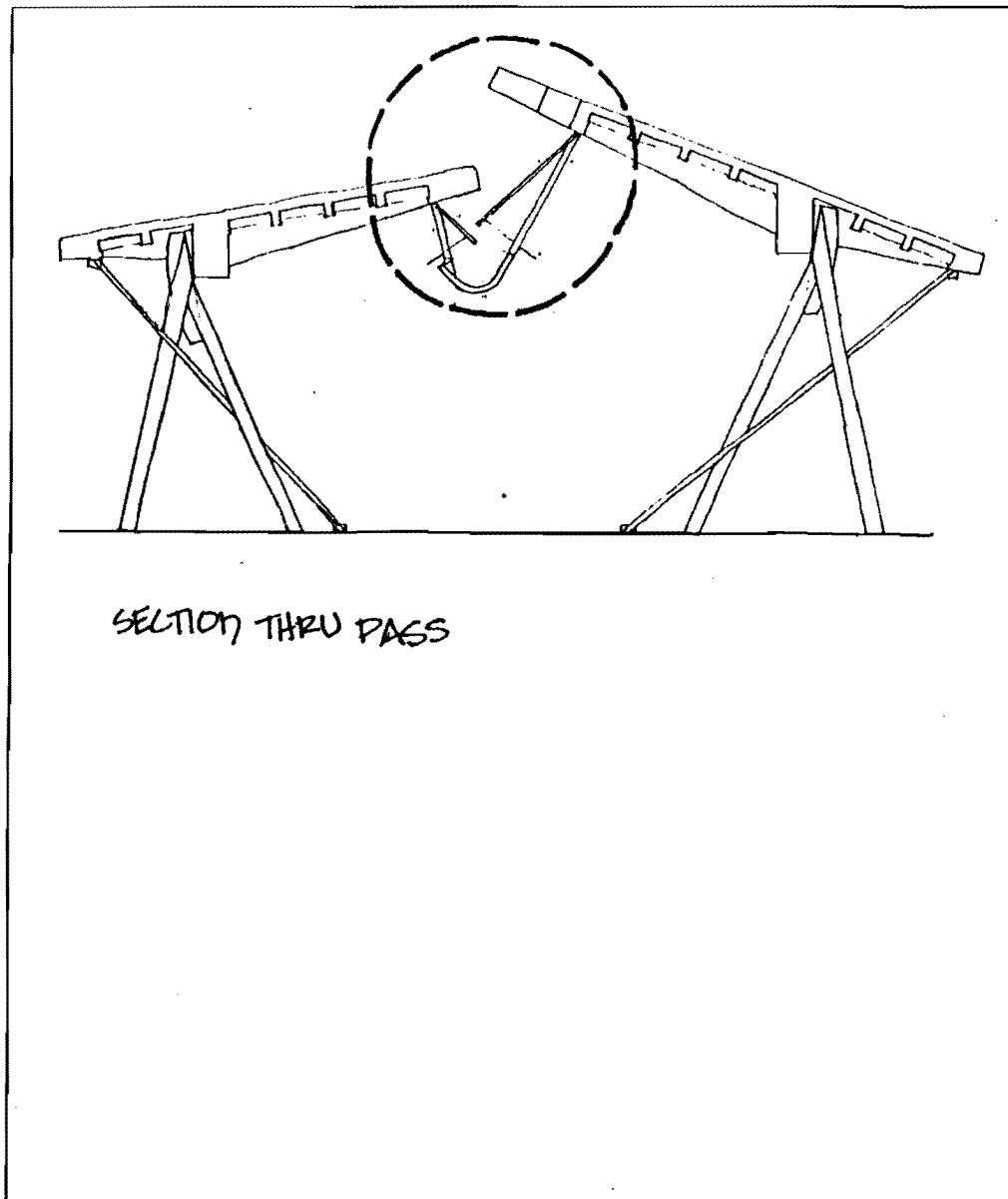
WATER COLLECTION

Roofs drain water into aqueduct which carries it to a cistern on the site. No outside pumping will be necessary.

VEGETATION

The value of existing plantlife was emphasized to contractors and, consequently, no plant specimens were damaged during construction.





ENVIRONMENT

ARCHERY FACILITIES¹⁹

Vall d'Hebron, Spain
Miralles Pinós

LIGHTING/ VENTILATION/ WATER

Troughs, placed in gaps created by roof, light and ventilate rooms and channel rainwater.

PASSIVE COOLING

South-facing windows are very small, allowing glimpses out but preventing overheating inside.

ENVIRONMENT

SAINSBURY CENTRE FOR VISUAL ARTS²⁰

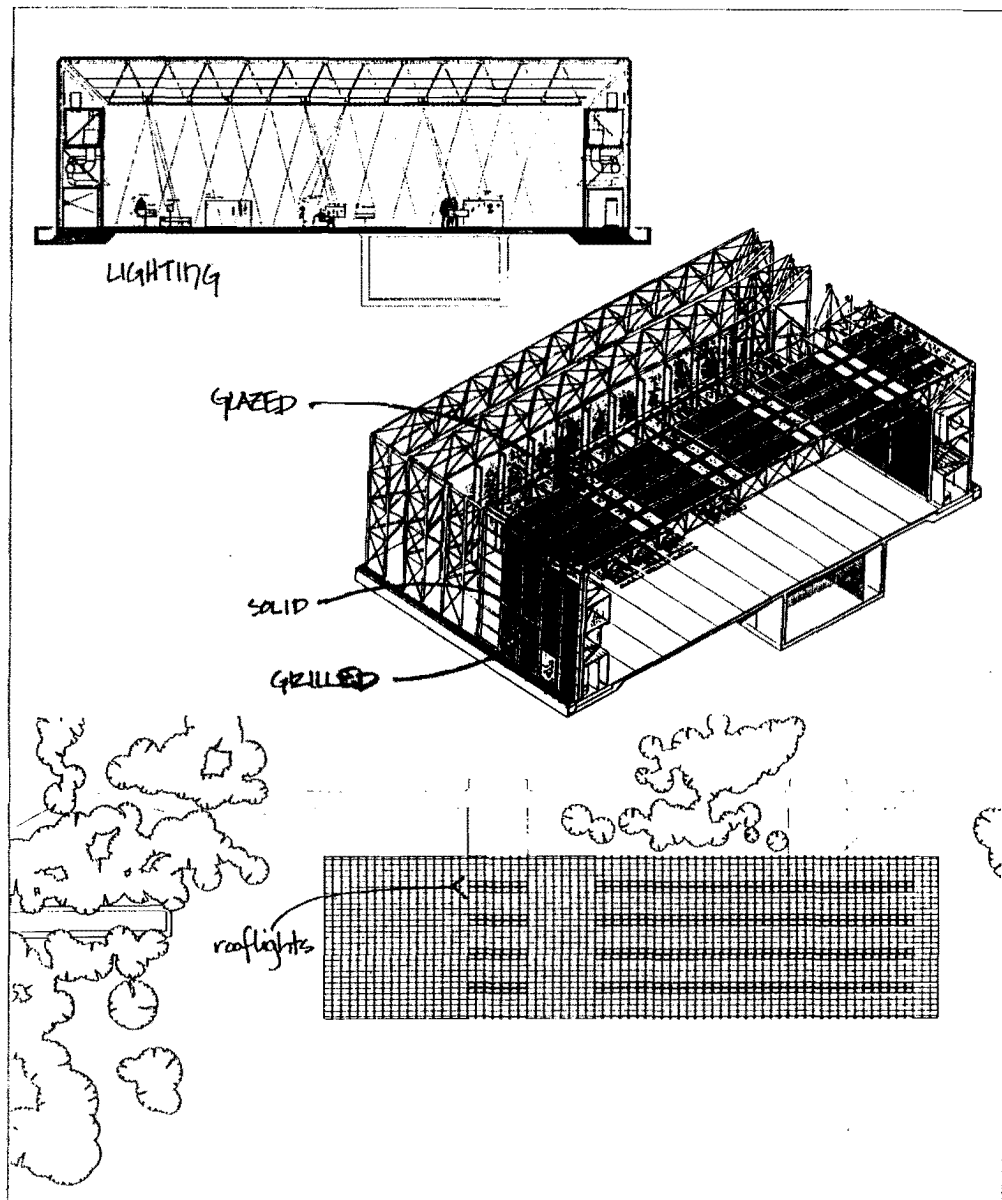
Norwich, England
Foster Associates

LIGHTING

Building's cladding consists of moveable glazed, gridded, or solid panels to adjust internal effects of natural lighting.

Open ends are internally lined with electronically controlled louvres which are connected to light sensors.

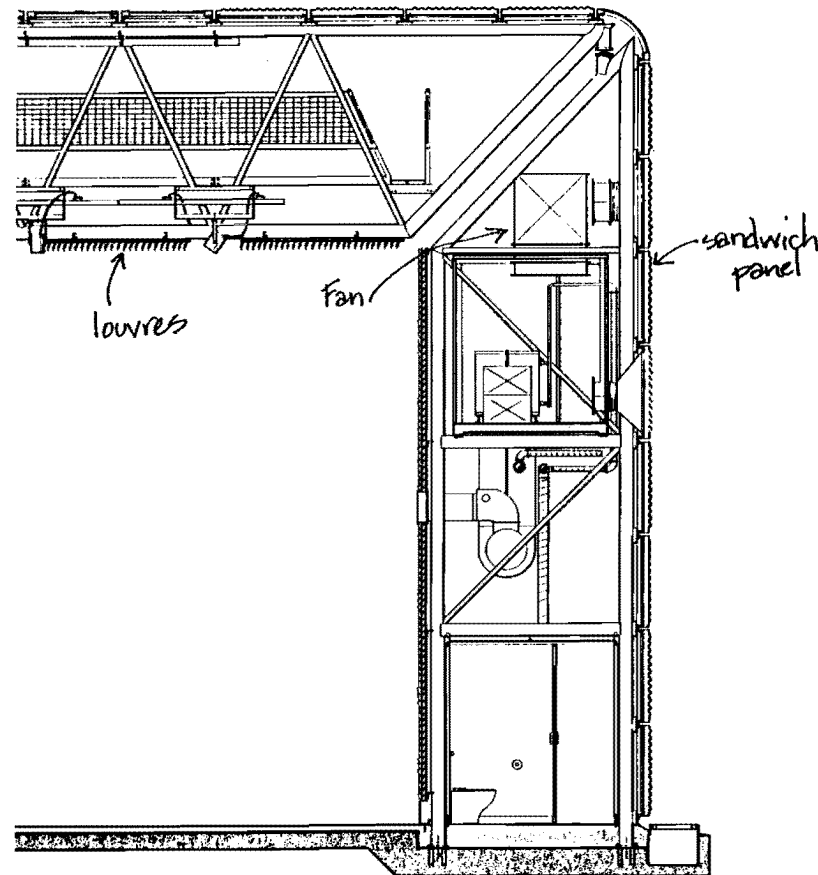
Strips of "roof-light" panels provide generous top lighting. These are also louvred, or "tuneable."



ENVIRONMENT

SAINSBURY CENTRE FOR VISUAL ARTS

Norwich, England
Foster Associates



SOLAR GAINS

Glass is 15mm annealed. Skin is made of "sandwich panels" of highly reflective aluminium and 100mm of Phenolic foam filling, which has a very high insulation value.

COOLING

Due to "stacking effect" of air in 7.5m high enclosure, only fans are needed to expel warm air at the top.

Academic timetable ensures that building is least populated during hottest part of the year.

TECHNOLOGY

INTRODUCTION

It's not very fashionable to talk about technology, but I don't see how you can escape talking about it, because I don't see how you can escape making things—that's what technology and our culture are.

--Norman Foster¹

There are currently two "strains" of advances in environmental technologies: the high-tech approach, which employs new research such as photovoltaic advances and energy-efficient glass, and the low-tech, or "commonsense" approach which uses passive heating and cooling strategies, and sun shading techniques, among others.² The following pages are intended as an introduction to some of the more familiar means of reducing a building's impact on the environment. They are not intended to be all-inclusive or complete, but they may provide helpful suggestions for the design of the facility.

It is important to note, however, that technologies for individual buildings will never significantly impact the environment as a whole. There must be a concerted, *regional* effort to "green" the architecture of a place before any improvements will be readily apparent. But this is a beginning.

TECHNOLOGY

PHOTOVOLTAICS

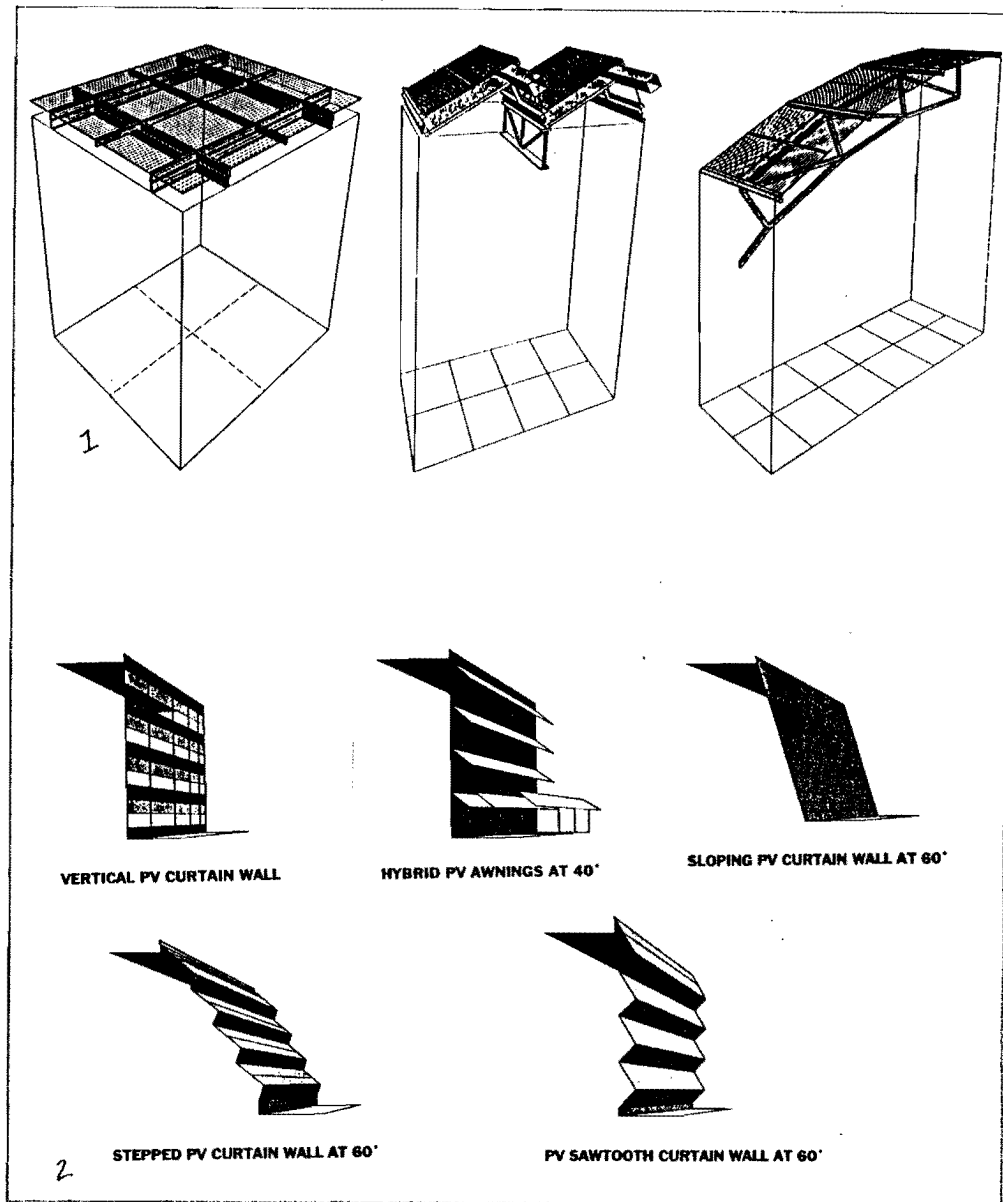
Photovoltaic technology "harnesses the energy of the sun to directly produce electricity." Sunlight striking silicon cells stimulates a flow of electrons that is collected by metal strips laid over the cells. The strips are wired to an inverter, which converts the collected current from DC to AC.^{3, 10}

Photovoltaic panels can now be integrated into a building's skin as roofing panels, skylights, curtain wall cladding, canopies, or rainscreens.

If, due to climate or solar orientation, photovoltaic technology does not prove feasible, it may be employed as a supplemental or backup system.

1) alternatives for incorporating photovoltaics into the roof system of a proposed conference center³

2) options for integrating photovoltaics into building walls¹⁰



TECHNOLOGY

PASSIVE CONDITIONING

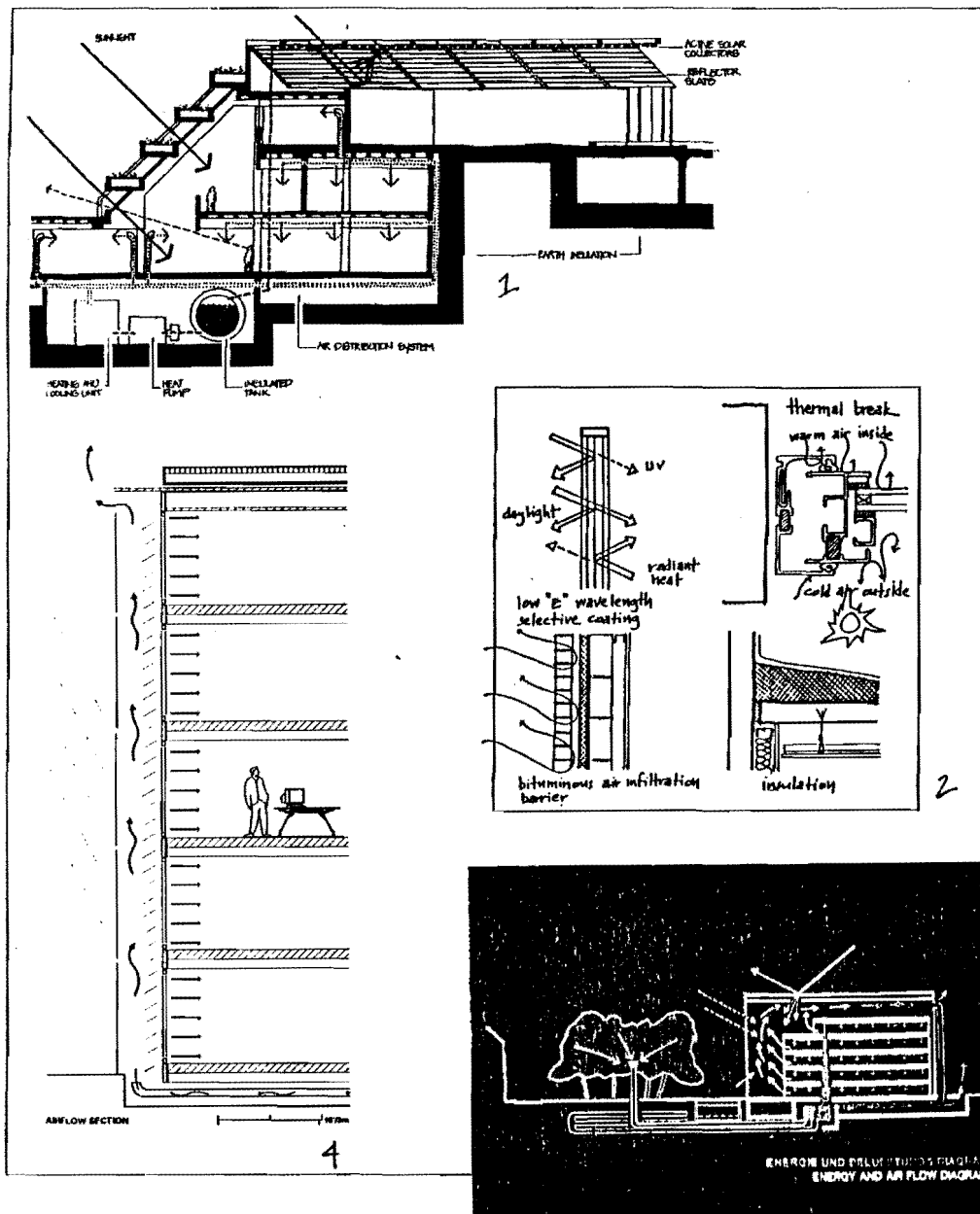
Passive heating and cooling have been employed since the first structures were built, but only recently have we begun to document and intentionally utilize these low-tech means of conserving energy.

1) Williamson Hall, University of Minnesota. Light and heat are admitted even to underground spaces, which are designed to collect it both actively and passively.⁴

2) some techniques for passive conditioning⁵

3) Electronic Park, Duisberg. Air intakes set in a stand of trees draw air through underground pipes, where it is heated or cooled according to the season.⁶

4) Business Promotion Center, Duisberg. Air rises through the wall cavity and is exhausted through vents located below the parapet. Continuous airflow traps and removes solar heat before it affects the building's interiors. In winter, warm air is pumped into the cavity, creating a thermal buffer.⁷



TECHNOLOGY

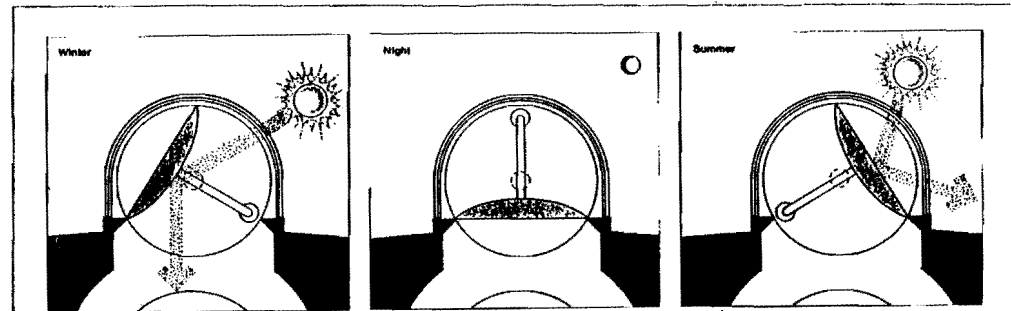
SUN SHADING

Shading from the sun's light and/or heat may be accomplished actively or passively. Active alternatives appear to be rising in use, but the value of such technology must be weighed against the increase in energy costs needed to operate the mechanism(s).

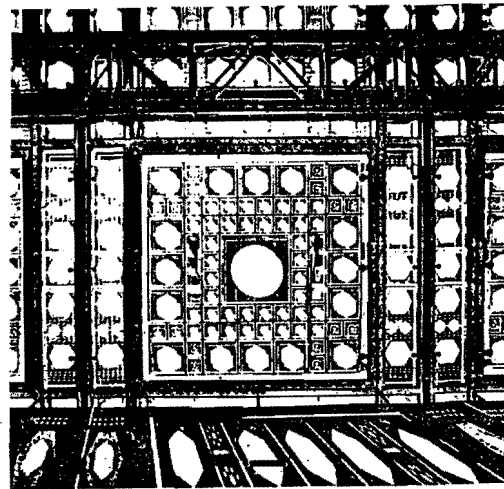
1) Washington DC house by Jersey Devil. A computer-controlled panel of insulation rotates diurnally and seasonally to control quantities of heat and light which pass through the skylight.⁸

2) Arab Institute, Paris. A wall of small metal pieces is mechanically controlled much like a camera iris diaphragm, opening and contracting to control sunlight.⁹

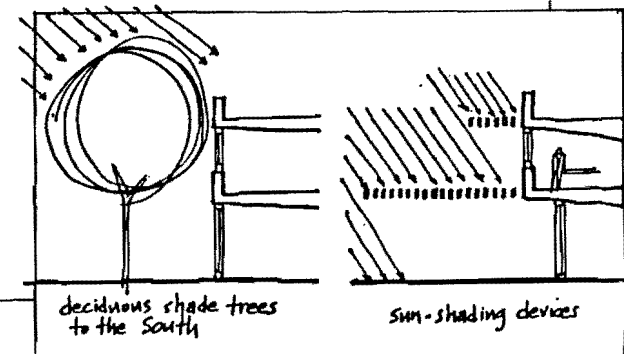
3) some passive shading techniques⁵



1



2



3

If God held all truth in his right hand and in His left hand the lifelong pursuit of it, he would choose the left hand.

—Soren Kierkegaard ²¹

On the highest plane of purpose, this built environment is to facilitate the accumulation and development of scientific knowledge. Intrinsic to any knowledge-procuring process is the ability and opportunity to communicate that knowledge. In the past, architects answered this dilemma with lounges or other leisure-specific areas "tacked onto the ends of corridors in out-of-the-way places," but current theory suggests that less formal "break out" spaces are more effectual,²² especially considering the fact that most exchanges of information happen at or near the work area.

While no design can force positive communication, the designer may provide forums for both formal and spontaneous exchanges of information. These case studies illustrate architectural attempts to engender casual conversation in the typically segmentalized environments of a laboratory.

Other informers: Louis Kahn's Richard's Medical Research Center ²³

COMMUNICATION

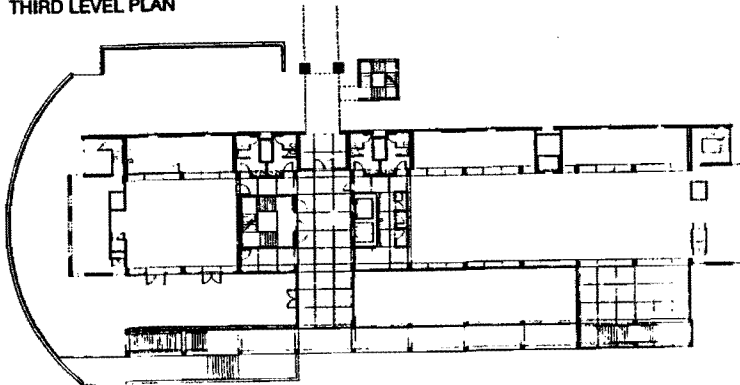
com-mu-ni-ca-tion (n) a process by which information is exchanged between individuals through a common system of symbols, signs, or information

COMMUNICATION

BIOMEDICAL INFORMATION COMMUNICATION CENTER²⁴

Portland, Oregon
GHA Architects

THIRD LEVEL PLAN



SECOND LEVEL PLAN



PROGRAM

Building accommodates a variety of interactive spaces which are distributed throughout.

CIRCULATION

Hallways are wide and open, with many opportunities for chance encounters.

COMMUNICATION

ART + ARCHITECTURE BUILDING ²⁵

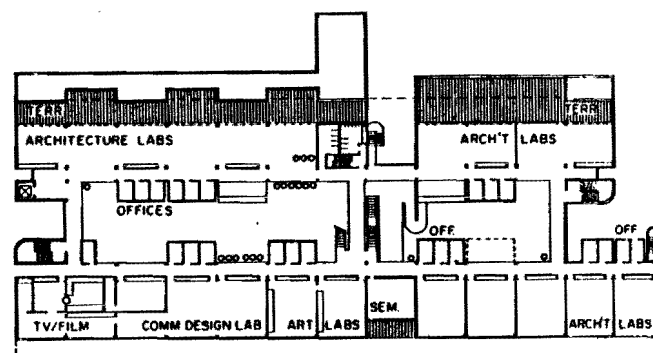
Knoxville, Tennessee
McCarty Bullock Holsaple

CIRCULATION

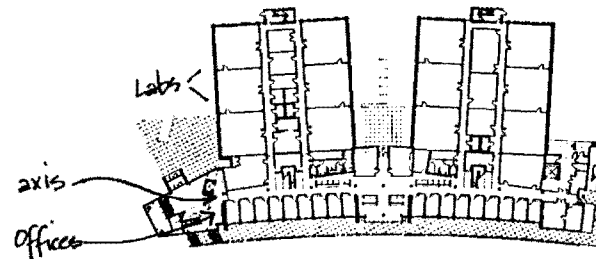
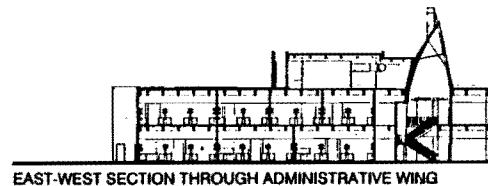
Walkways are wide and visible from many vantage points.

PLAN

Open plan permits visibility and communication across long distances.



LEVEL 3



COMMUNICATION

COOLEY SCIENCE CENTER²⁶

Portland, Oregon
Boucher Mauchka Larson

CIRCULATION

Offices are deliberately separated from research areas by main building axis that becomes a social corridor.

Two split stairways at juncture of lab and administrative wings encourage interaction between researchers.

PLAN

On second floor, the conference room, open work spaces, study carrels, and computer terminals are clustered to encourage interdepartmental communication.

LABORATORIES

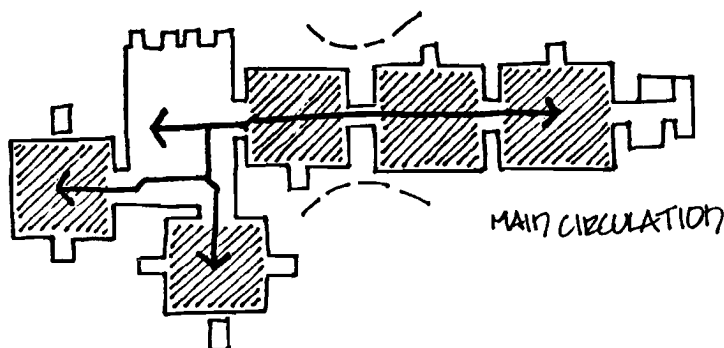
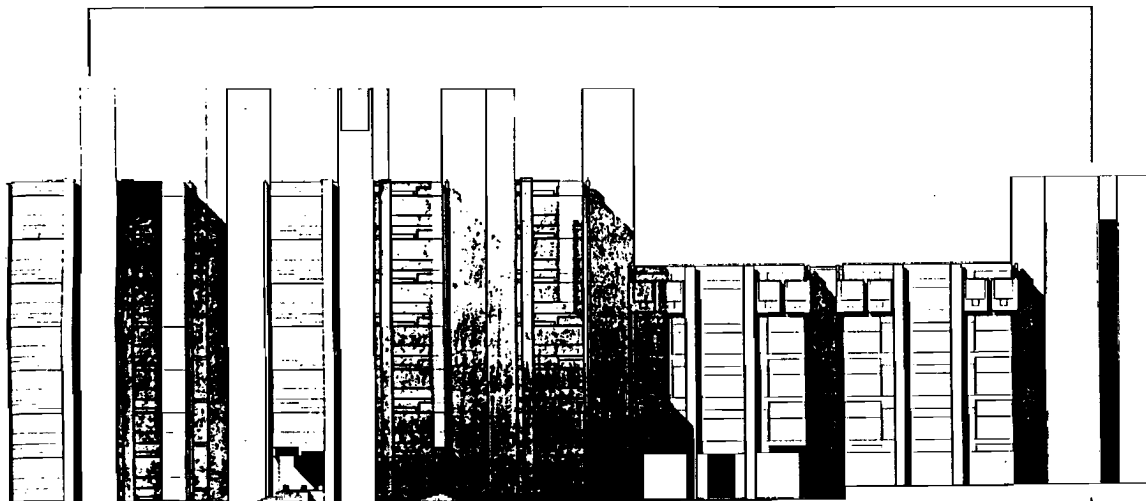
INTRODUCTION

Too often the complexity of lab buildings is defined mainly as mechanical complexity. The real complexity involves understanding how a group of scientists works.

--Alton Parks¹

Several very significant research facilities, while not analyzed in the case studies, seemed important or relevant to the focus of this book. They are included in this section. They have been addressed from the point-of-view of the issues determined previously: context, environment, and communication. However, this discussion is not intended to be critical as there was, in no case, enough information to make an educated critique; they should be seen simply as observations.

One very noticeable element of these designs is the adaptability of the lab spaces. This is accomplished most directly by oversizing mechanical systems, including main ducts, casings on air-handling equipment, chase space and electrical systems capacity.¹



LABORATORIES

RICHARDS MEDICAL
RESEARCH LABORATORY^{2,3}

Philadelphia, Pennsylvania
Louis Kahn

Kahn designed this building for the University of Pennsylvania. Like many of his other designs, the service spaces (stairwells, chases, etc.) are separated from the served spaces (labs).

Although this building's height, roofline, and "style" are very different from surrounding buildings, it does appear to have similarly proportioned openings.

Movement through major spaces puts the scientists in contact with each other under working conditions and also funnels them through narrow links, both of which engender communication.

LABORATORIES

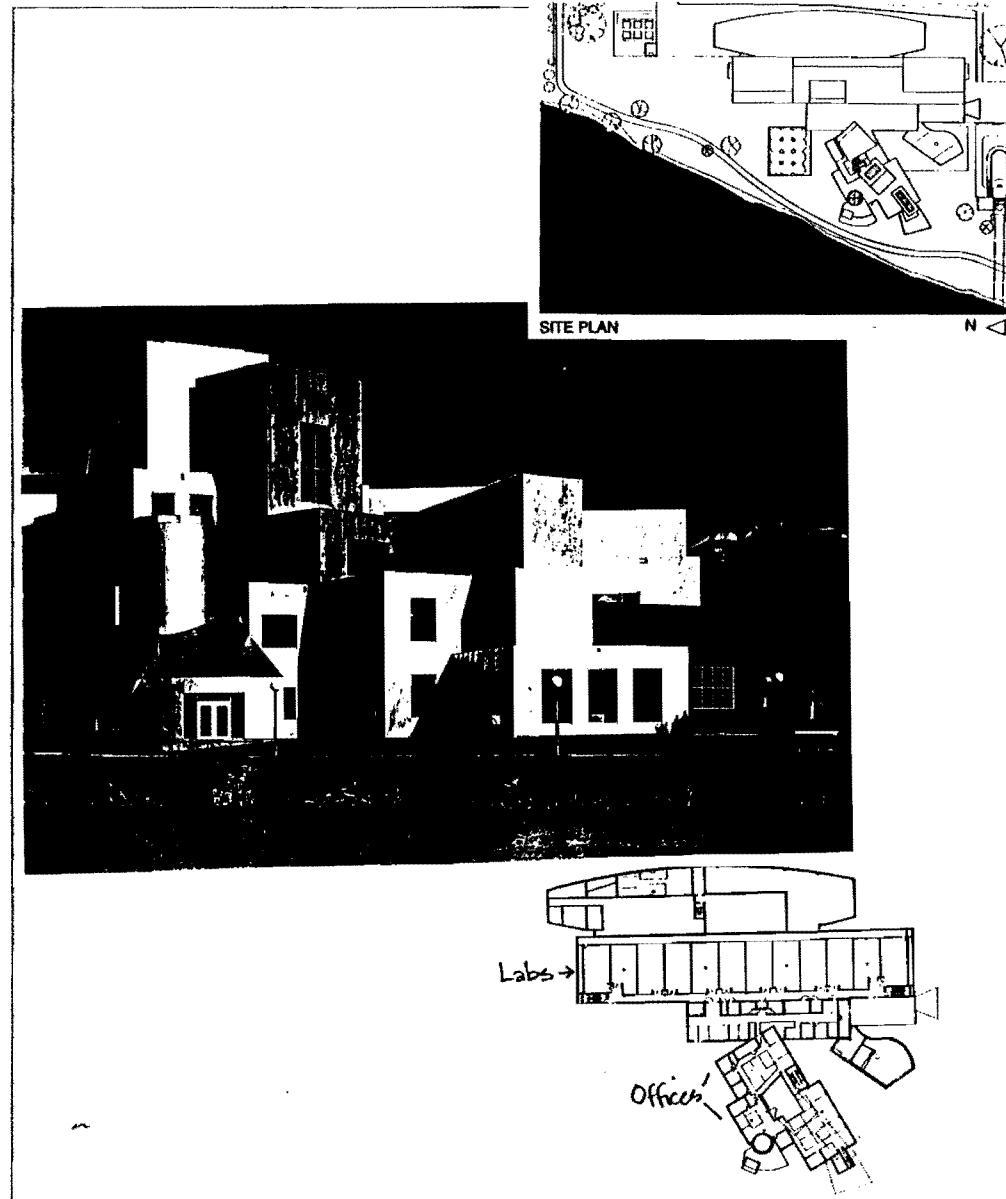
IOWA ADVANCED TECHNOLOGY LABORATORIES⁴

Iowa City, Iowa
Gehry & Associates

This laboratory supports interdisciplinary teams that research topics from acid rain to computer-aided design software.

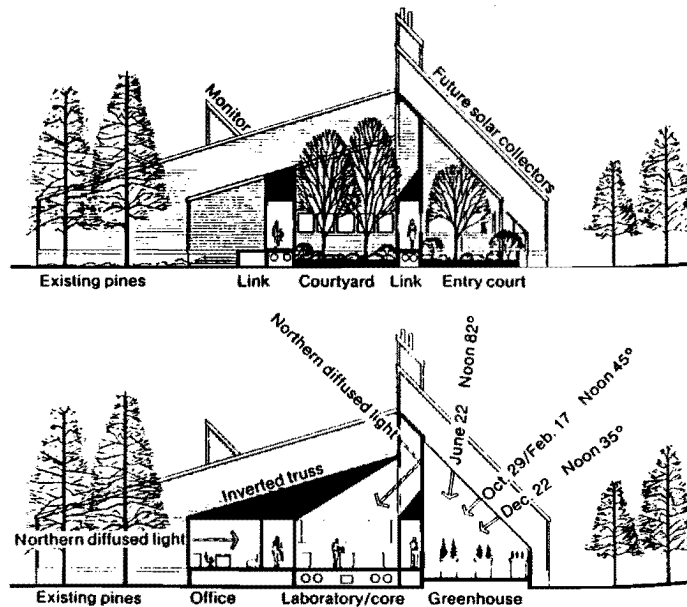
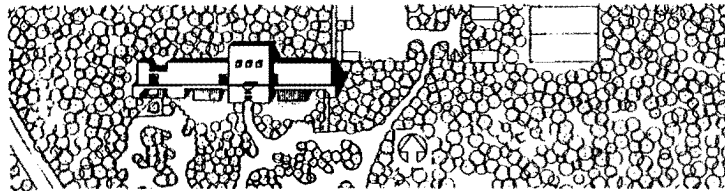
The building responds well to its collegiate context. With what has been dubbed "alternative contextualism," it stands out from its surroundings, but reinterprets and combines certain features of nearby buildings. The materials and forms also reflect the more significant features of the area: from Iowa's open sky to its not-too-distant corn silos.

Gehry's architectural definition of internal functions separates the scientists' offices from their lab spaces; therefore, they will at least meet in passing.



LABORATORIES

WESTVACO FOREST
SCIENCE LABORATORY[®]
Summerville, South Carolina
Lucas Stubbs Pascullis
Powell & Perney



This laboratory was established for the study and development of means of reforestation.

Because of this environmental purpose, it was essential for the design to respond appropriately to the wooded site chosen. "The lab takes its form as a long spine stretched out in a wooded clearing to meld the users with the landscape." Additionally, its single-level organization reinforces the users connection with the land.

The shed form and orientation of the building provide for hot water solar collectors on the South side and diffused natural light on the North side.

Three interior courtyards along the spine connect the labs to nature and, visually, to each other.

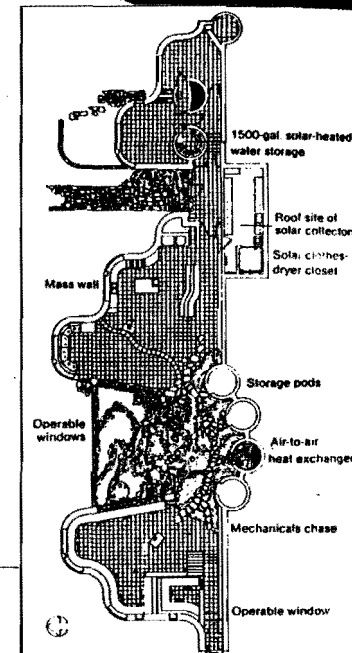
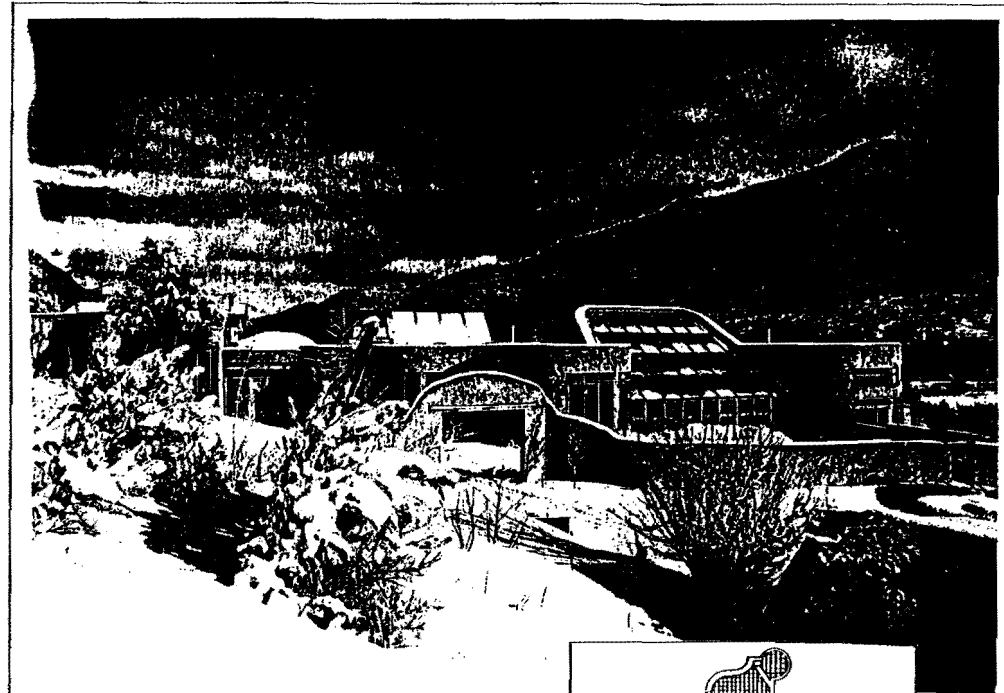
LABORATORIES

ROCKY MOUNTAIN INSTITUTE RESEARCH CENTER⁶

Old Snowmass, Colorado

This is a 4000sq. ft. house/office/
greenhouse which became a flagship for
environmental design in the mid-1980's.

It implements many previously
uncommon environmental technologies,
including ultrasonic light switches,
compact fluorescent lights, a solar
clothes drying cabinet, ultra-low-flush
toilets, and many others. The facility is
over 99 percent passive-solar heated and
uses less than a tenth the electricity and
half the water of other, comparable
buildings. 16" thick walls and 150 tons
of sandstone facing create a heat-storing
mass of approximately 1 million pounds.
A curving south wall and an over-
hanging cantilevered arch allow light
and heat to penetrate to the north side of
the building during winter but block
excess sun penetration in summer.



Certain points have been discovered or at least reiterated in this study of issues and should be explicitly stated.

A response to "context" does not presuppose conventional architectural contextualism, where the building mimics its setting. Additionally, conscientious architecture does not deny its position on the ground, but instead makes a respectful intrusion into the land that perpetuates the ideas, though rarely the form, of the natural landscape.

Environmentally conscious design maximizes existing elements, using their materiality, form, or composition to enhance functional processes which have minimal impact on the environment.

Although communication is predominantly a social phenomenon, architectural design may encourage or facilitate exchanges of information.

ISSUE ANALYSIS



DRAINAGE DITCH

CONCLUSIONS

SPATIAL ANALYSIS

CLIENT PROFILE

- 1.1 DESCRIPTION
- 1.2 STATEMENT OF
PURPOSE
- 1.3 ORGANIZATION

SPATIAL ANALYSIS

- 2.0 OVERVIEW
- 2.1 PUBLIC
- 2.2 LIVING
- 2.3 RESEARCH
- 2.4 EXTERIOR

CODE ANALYSIS

- 3.1 OCCUPANCY
- 3.2 TYPE OF
CONSTRUCTION

INDEX

CLIENT PROFILE

DESCRIPTION

CLIENT

The Kingsport Board of Mayor and Aldermen has appointed a Board of Directors for the research facility. Final design decisions and approval will rest with this board. However, the City will be regularly informed of design and construction progress.

The board is composed of an environmental expert (possibly from the National Park Service or the University of Tennessee), as well as representatives from local industries, from East Tennessee State University--Science Department, from Bays Mountain Park, from the Kingsport Board of Mayor and Aldermen, and from the public realm (interested citizens). The Board of Directors has between seven and nine members.

PROPERTY OWNER

Ownership of the park will remain with the City of Kingsport. The park grounds and personnel are under the jurisdiction of the Kingsport Department of Leisure Services.

FINANCIAL SUPPORT

Money for this project will be provided by the City of Kingsport, by the Environmental Protection Agency, and possibly by the State of Tennessee.

CLIENT PROFILE

STATEMENT OF PURPOSE

As our nation, and especially the Southeast, discovers how vulnerable our environment is and begins to understand its systems, it begins to search for some means of altering or redirecting environmentally harmful processes. Consequently, the demand for ecological research and information centers grows. Perhaps more than in any other city in the country, Kingsport is in a position to establish a center for ecological and environmental study. All of the social and economic "players" are present, and the scientific community--not only in this region, but nationally--is in dire need of appropriate, adequate facilities for such study. The leaders of Kingsport have recognized this opportunity, discovered that it corresponds with the city's goals, and seen that funding will be available to keep it in operation. With a 3,000-acre nature preserve under its jurisdiction, Kingsport can potentially afford to make an intrusion into the land for the "sake of the greater good."

The City of Kingsport was established as an industry-based community, but the growth of the city and surrounding areas has placed new demands not only on the city's infrastructure, but also on the goals and plans of the city's leadership. Consequently, organizations such as Kingsport Tomorrow and programs like "Vision 2017" have proposed alterations in Kingsport's focus and the establishment of (or improvement of existing) cultural, recreational, educational, and scientific centers. A new research facility atop Bays Mountain Park corresponds directly with these goals. Additionally, this facility will draw people from the greater scientific community to the beauty and history of the Kingsport area and Upper-East Tennessee. Such people may choose to return as tourists, or even as residents, thus improving not only the social, but the economic base of the city.

Kingsport's industries are seriously concerned about the impact of their processing and production techniques on the environment. Although coming under control now, air, water, and thermal pollution have run rampant throughout Kingsport's history. Perhaps because they are truly concerned, perhaps because the Environmental Protection Agency threatens to force closure, or perhaps because they need to improve public relations, local industries and manufacturing facilities are willing to spend significant amounts of money on research aimed at reducing their waste and toxic substance levels. This research center provides a setting for such studies in a natural environment--away from the problem's influence. Also, this facility will become a "source center," where other industries or research laboratories may receive information to assist their studies.

East Tennessee State University is another potential source of funding. Only twenty minutes away by car, the facility may be used as a satellite laboratory for university research. Professors may come for sessions of intense research, or students may come for brief immersions in the natural and scientific environments. Like all programs taking place here, the University's projects would be funded by the sponsoring organization, by private donations, by special allocations from the city, or by government grants.

Having realized the potential benefits of such a project, Kingsport established a Board of Directors for the new research facility. The board, after consulting with park personnel, developed a set of purposes and goals for the facility. It will serve primarily as a retreat for study of the natural environment by members of the scientific and industrial communities. It should provide a variety of spaces for interaction among the scientists, for group study, and for individual study. Secondary functions include a gathering place for scientists and local organizations as well as a small rest area for hikers. The park personnel believe that these auxiliary functions will improve public awareness of the park and its amenities and are therefore willing to permit its construction within the preserve. However, they and the Board have determined that the construction and use of the facility should intrude as little as possible on the complete ecosystems already in place in the park. Furthermore, they have asked the designer to investigate and develop means of design and construction that minimize wastes and reduce energy consumption.

The board believes that this should be a place which fosters the integration of various scientific disciplines as a means of enhancing knowledge and balances what is taken from the environment with what is given to it.

CLIENT PROFILE

STATEMENT OF PURPOSE

CLIENT PROFILE

ORGANIZATION

CITY OF KINGSPORT is informed of all issues regarding facilities but does not participate in decision-making process

BOARD OF DIRECTORS governs operations of facility, makes decisions regarding applications for research

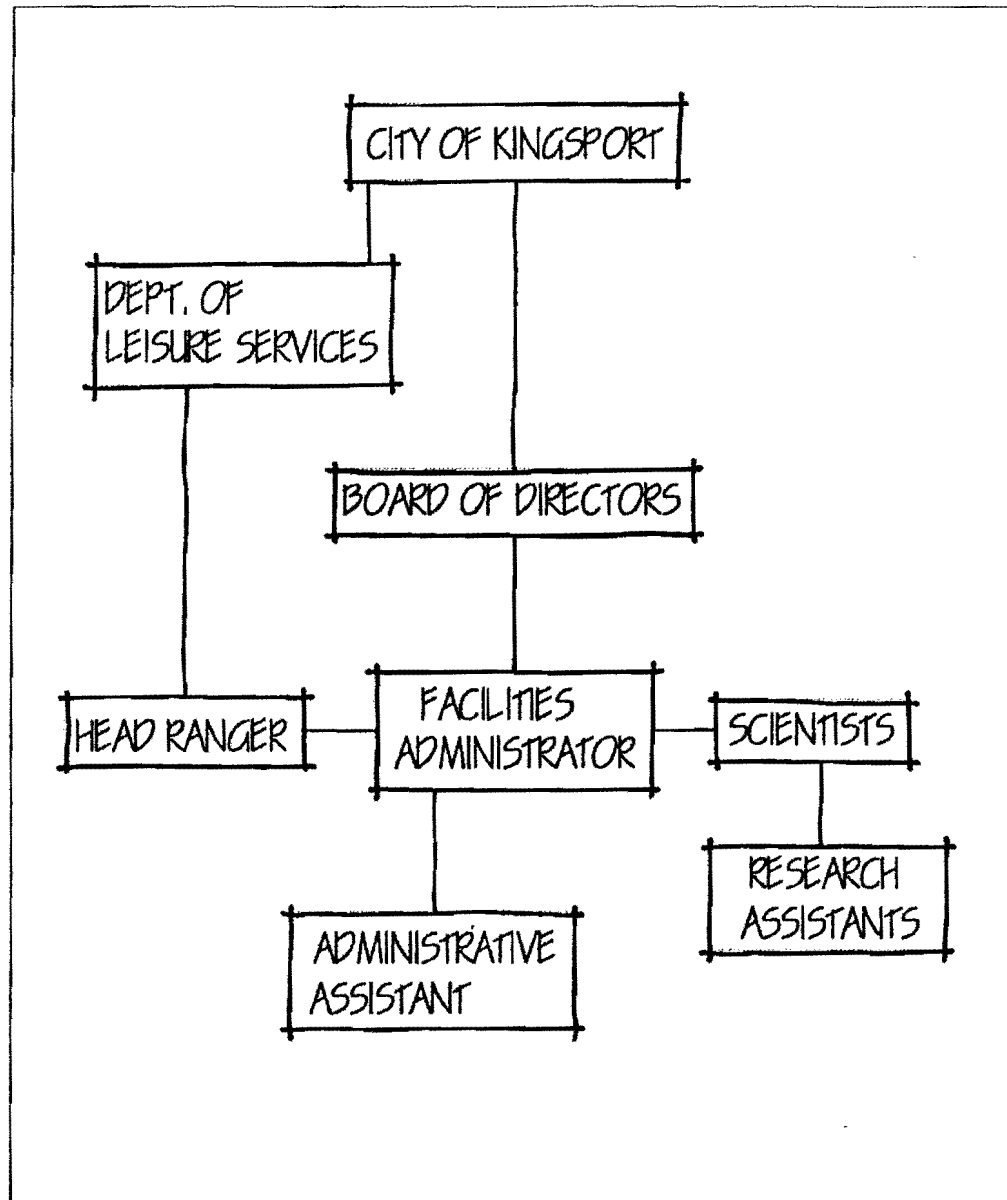
FACILITIES ADMINISTRATOR oversees daily operations, is not responsible for park issues but coordinates activities with head ranger

HEAD RANGER directs park, may advise on large-scale decisions or act as research consultant

SCIENTISTS participate in joint research on the premises; all results are the shared property of the scientists and the Board

ADMINISTRATIVE ASSISTANT assists the administrator in operation and organization of facility matters

RESEARCH ASSISTANTS assist scientists in use of facilities, know what is available and where it is stored



SPATIAL ANALYSIS

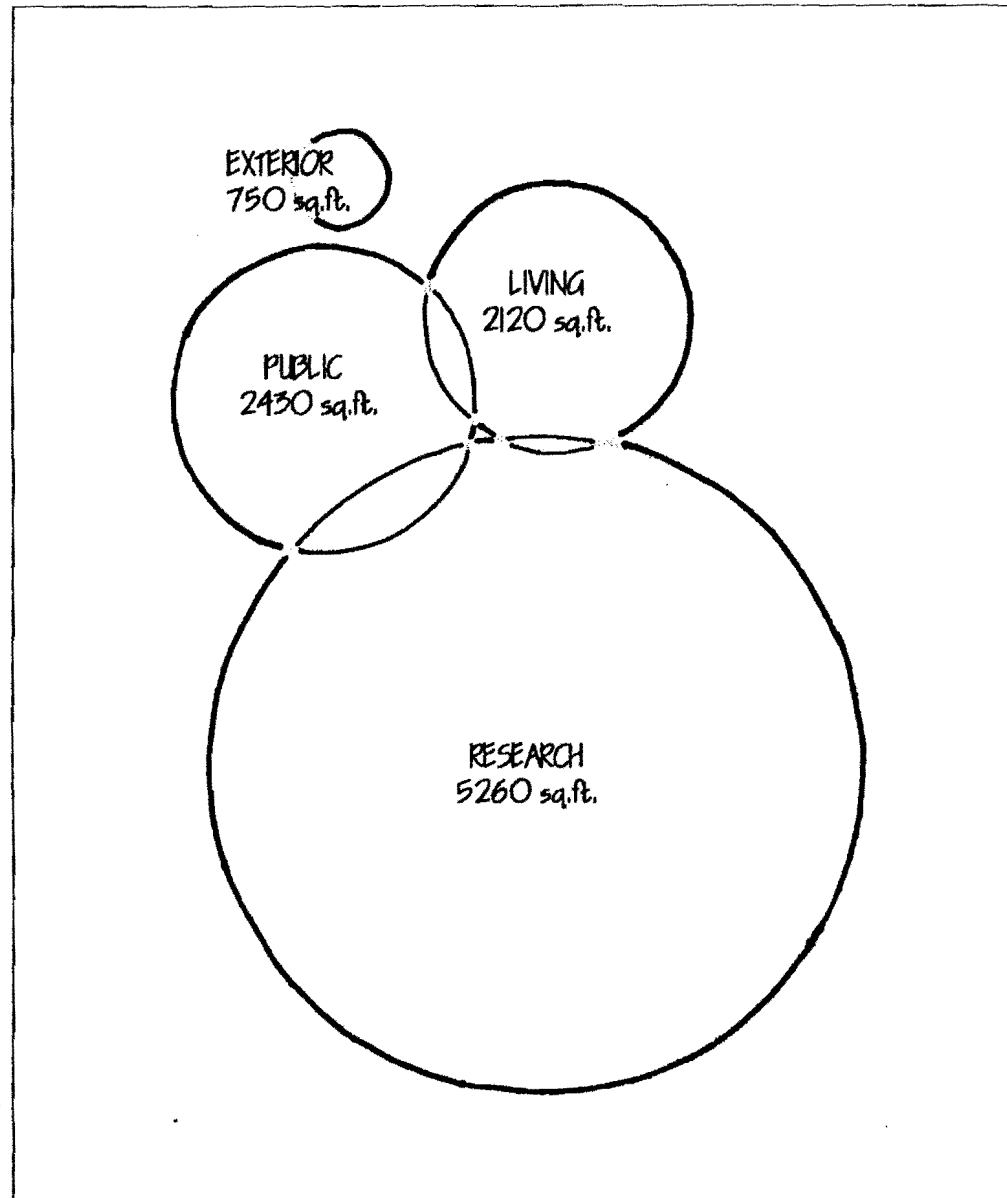
OVERVIEW

AREAS

This facility is composed of three areas: that for living, that for research, and that for the public, with supplementary external functions.

LEGEND

-  natural light
-  special ventilation
-  privacy
-  view
-  acoustic insulation
-  special lighting
-  security
-  exterior door
-  exterior space
-  indirect connection



SPATIAL ANALYSIS

OVERVIEW

SPACES

PUBLIC

reception	500
administrator's office	200
conference	700
kitchen	100
storage	100
mechanical	150
toilets	300
janitor's closet	80
outdoor rest area	180
education/orientation	50
first-aid	70

2430

LIVING

commons area	400
kitchen	200
sleeping-8@100	800
private-4@80	320
toilets-4@80	320
recycling	30
storage	50

2120

RESEARCH

laboratories-3@800	2400
research plots-3@300	900
library	300
assistants offices-3@100	300
scientists offices-10@100	1000
toilets-3@20	60
storage-3@100	300

5260

EXTERIOR

parking	600
dock	150 linear
trails and road	450 linear

750

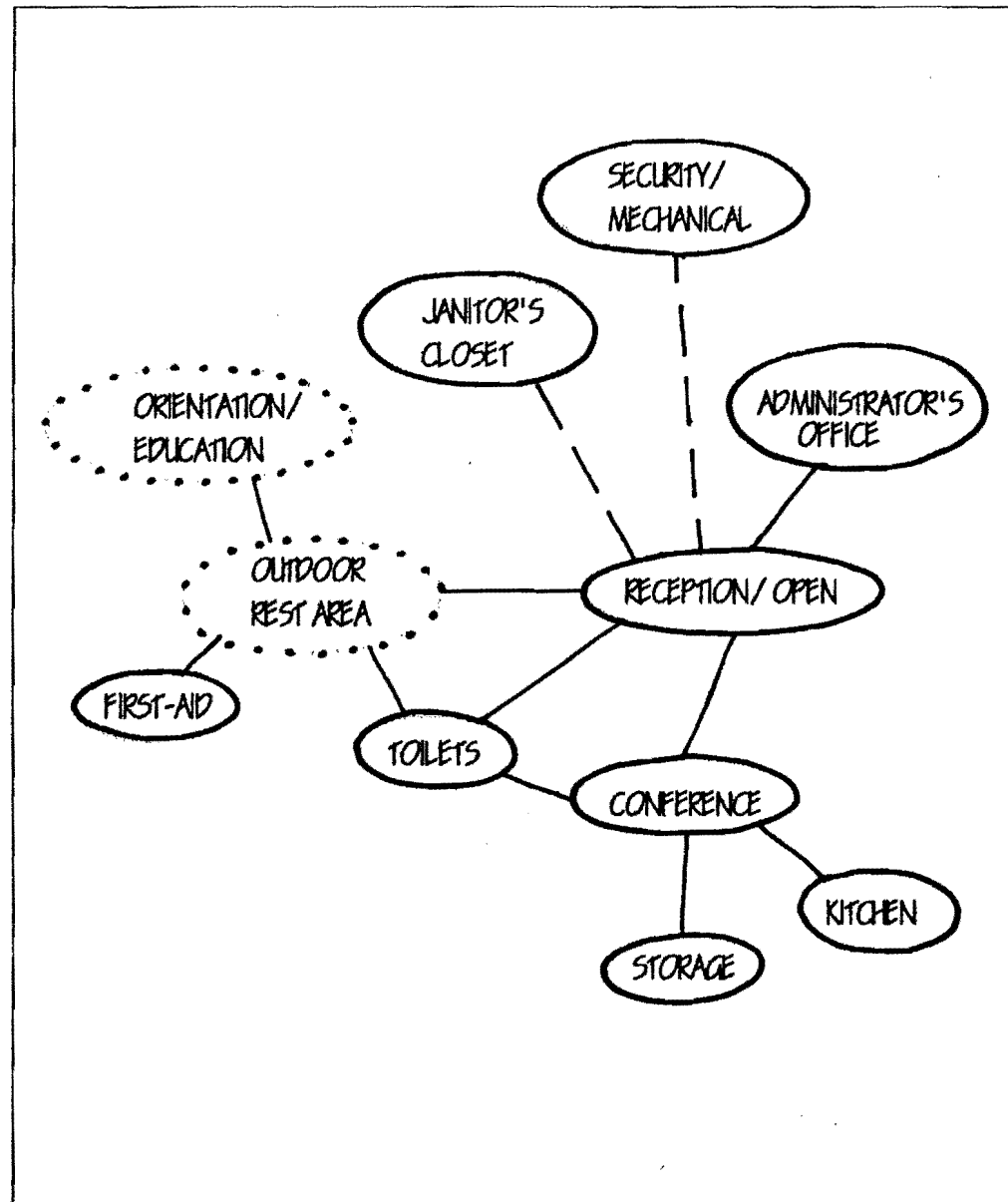
TOTAL* 10,560 sq. ft.

*Net total excludes circulation and some mechanical spaces.

SPATIAL ANALYSIS

PUBLIC

ADJACENCIES



SPATIAL ANALYSIS

PUBLIC

RECEPTION/ATRIUM

This is the entry point and circulation hub for the entire facility. It should be the "show place"--open and representative of the facility, with the possibility of housing small displays. The layout of the building should be clearly and easily understood from this space. It also acts as a control point for conferences and other related events.

Size: 500 sq.ft.

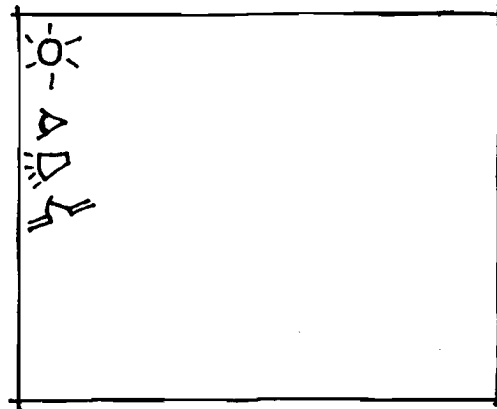
Occupants: varies, min. 1

Adjacencies: administrator's office,
conference, outdoor rest area

Furniture: desk/counter, chairs, benches,
potted plants

Finishes: formal

Equipment: computer, fax, telephone,
filing cabinet



SPATIAL ANALYSIS

PUBLIC

ADMINISTRATOR'S OFFICE

This is the primary work space for the facilities administrator. He/She may hold 2-4 person meetings in this room as well.

Size: 200 sq.ft.

Occupants: 1

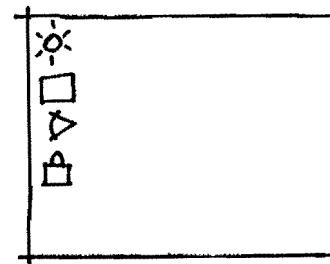
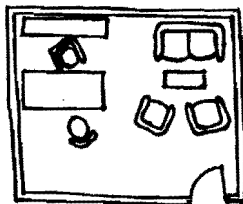
Adjacencies: reception

Furniture: desk, chairs, shelves, couch, coffee table, filing cabinet(s)

Finishes: formal

Equipment: computer, telephone

POSSIBLE LAYOUT



SPATIAL ANALYSIS

PUBLIC

CONFERENCE ROOM

This is a place of formal coming together for local organizations and members of the scientific community. The space and furnishings should be flexible enough to accommodate groups of 8 to 30 persons with any variation of presentation formats. There is also the possibility that the space may be used for displays or exhibitions exclusive of a conference.

Size: 700 sq.ft.

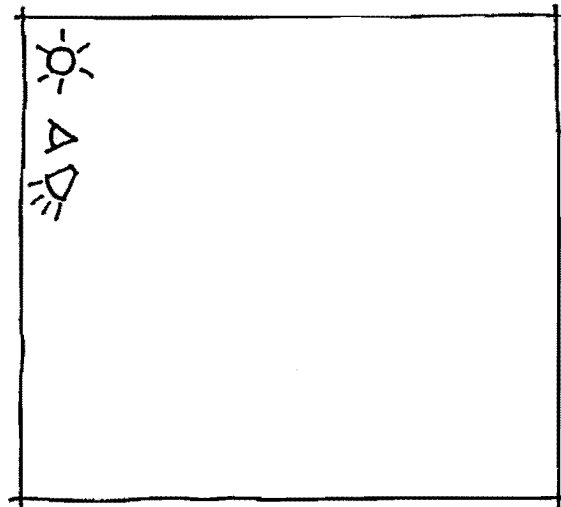
Occupants: 30

Adjacencies: reception, kitchen, storage, toilets

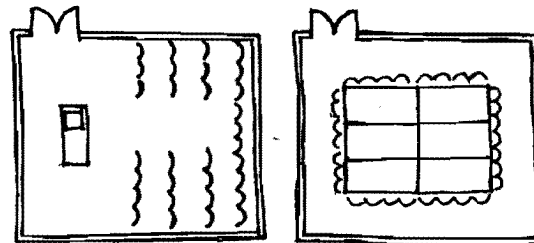
Furniture: 35 chairs, tables, lectern, mechanisms of hanging wall displays

Finishes: formal

Equipment: overhead projector, slide projector, projector screen, VCR projector, lighting controls



POSSIBLE LAYOUTS



SPATIAL ANALYSIS

PUBLIC

KITCHEN

This is a service area for the conference room. It will be used occasionally for last-minute and small scale preparation of food and drinks for conference participants.

Size: 100 sq. ft.

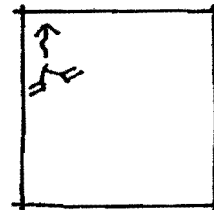
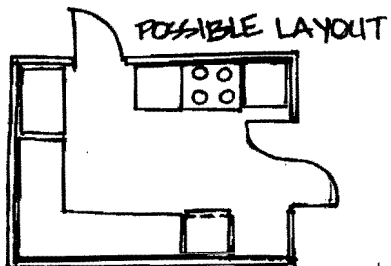
Occupants: up to 3

Adjacencies: Conference

Furniture: --

Finishes: utilitarian

Equipment: sinks, stove/oven, refrigerator, dishwasher, microwave, garbage disposal, various small appliances



SPATIAL ANALYSIS

PUBLIC

STORAGE

This space also services the conference room, holding furniture and equipment that is not in use.

Size: 100 sq.ft.

Occupants: --

Adjacencies: conference

Furniture: shelves

Finishes: utilitarian

Equipment: racks for tables and chairs

2.1.5

SPATIAL ANALYSIS

PUBLIC

SECURITY/MECHANICAL ROOM

This is a service area which provides access to HVAC and other building systems equipment. It should also accommodate a security guard and his necessary equipment.

Size: 150 sq.ft.

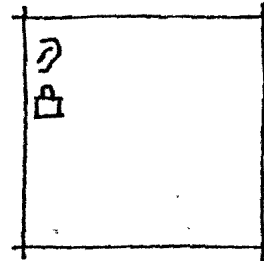
Occupants: 1

Adjacencies: --

Furniture: desk, chair, filing cabinet

Finishes: utilitarian

Equipment: mechanical equipment, key rack, possibly surveillance videoscreens



SPATIAL ANALYSIS

PUBLIC

TOILETS

Men's and women's toilets are to serve users of the outdoor areas, reception and administration personnel, and conference participants.

Size: 150 sq. ft. each

Occupants: 2 in each

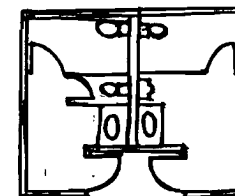
Adjacencies: reception, conference, outdoor rest area

Furniture: --

Finishes: utilitarian

equipment: toilets, partitions, urinal, sinks

POSSIBLE LAYOUT



SPATIAL ANALYSIS

PUBLIC

JANITOR'S CLOSET

This is storage space for janitorial supplies.

Size: 80 sq.ft.

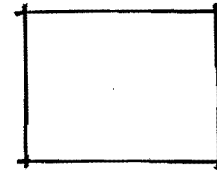
Occupants: --

Adjacencies: --

Furniture: --

Finishes: utilitarian

Equipment: shelves, hooks, mop sink



2.1.8

SPATIAL ANALYSIS

PUBLIC

OUTDOOR REST AREA

This is a stopping point or mid-hike goal for those hiking in the preserve. It should offer shade and a pleasant view of the lake.

Size: 180 sq. ft.

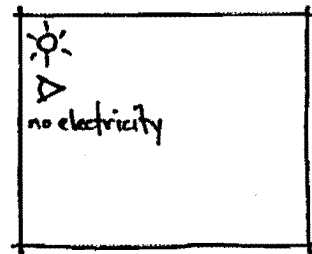
Occupants: 6

Adjacencies: reception, toilets, orientation, first-aid

Furniture: benches

Finishes: informal

equipment: water fountain



SPATIAL ANALYSIS

PUBLIC

ORIENTATION/EDUCATION CENTER

This is a point of orientation along the trail. It will offer protected informational displays about the preserve and its natural inhabitants, as well as a locator map. It should act as a miniature landmark for passers by.

Size: 50 sq.ft.

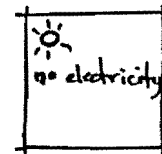
Occupants: --

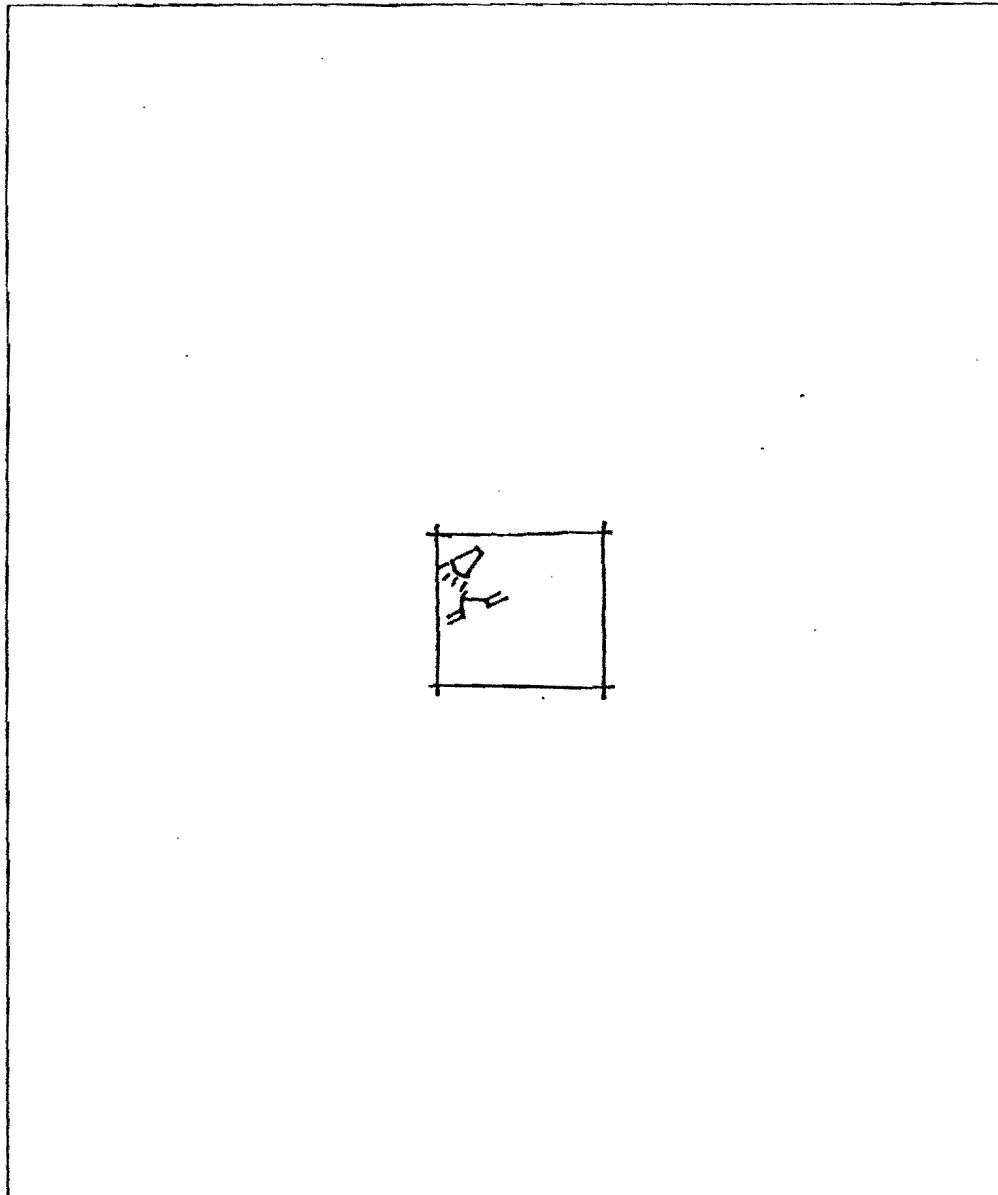
Adjacencies: outdoor rest area

Furniture: watertight display cases

Finishes: informal

Equipment: --





SPATIAL ANALYSIS

PUBLIC

FIRST-AID AREA

This is an unmanned space made necessary by the distance from the nature center to this portion of the trail. It serves hikers who become injured while hiking. Visible monitoring should be possible from the facility.

Size: 70 sq.ft.

Occupants: 4 max.

Adjacencies: outdoor rest areas

Furniture: shelves, table, chair, cabinets, doctor's bed

Finishes: utilitarian

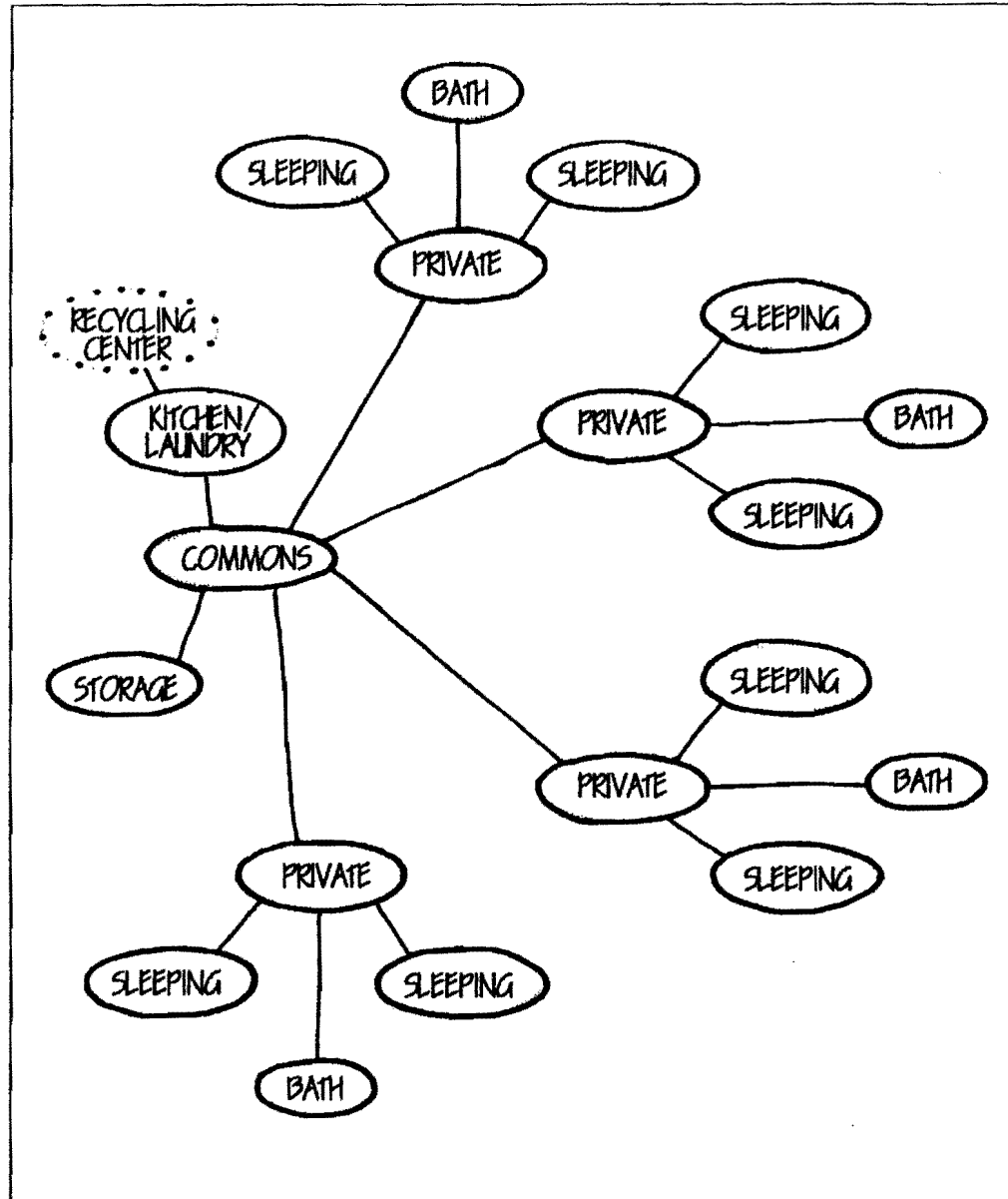
Equipment: first-aid supplies, sink

2.1.11

SPATIAL ANALYSIS

LIVING

ADJACENCIES



SPATIAL ANALYSIS

LIVING

COMMONS AREA

This is the relaxation space for the scientists in residence. It should have the quality of a home living room or den with a variety of diversionary activities available. A portion of this space will be used for eating, like a dining room.

Size: 400 sq.ft.

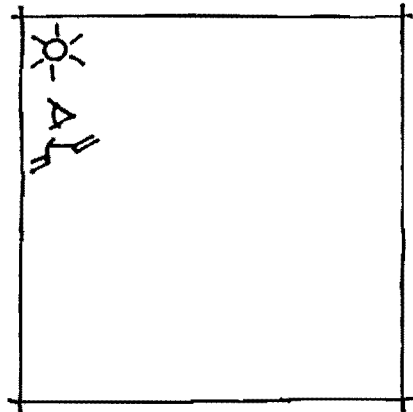
Occupants: 9

Adjacencies: private areas, kitchen, storage

Furniture: Ping-Pong table, couches and chairs, television, small tables, dining table with chairs, shelves

Finishes: informal

Equipment: games, recreational materials, VCR, stereo



SPATIAL ANALYSIS

LIVING

KITCHEN

In this space, all of the scientists' meals and snacks are prepared for group eating. It should be planned very efficiently and have an opening or pass-through connecting it to the commons area. A washer and dryer are also located here.

Size: 200 sq. ft.

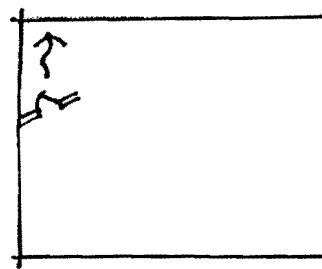
Occupants: 4 max.

Adjacencies: commons

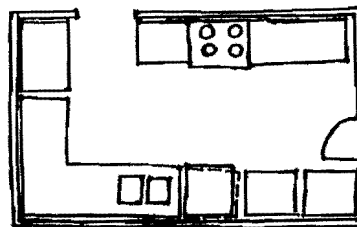
Furniture: possibly small table with 2 chairs

Finishes: utilitarian

Equipment: sinks, dishwasher, oven/stove, refrigerator, garbage disposal, microwave, washer and dryer, small appliances



POSSIBLE LAYOUT



SPATIAL ANALYSIS

LIVING

SLEEPING ROOMS

This is the place of individual retreat and quietness for the scientists. It will be used almost exclusively for sleeping, but should still provide for occasional study, personal correspondence, reading, etc.

Size: 100 sq. ft. each

Occupants: 1 in each

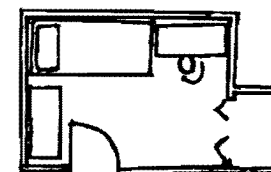
Adjacencies: private area

Furniture: bed, desk, chair, bureau, lamp, mirror

Finishes: informal

Equipment: --

POSSIBLE LAYOUT:



SPATIAL ANALYSIS

LIVING

TOILET

Each facility serves two sleeping rooms.

Size: 80 sq.ft. each

Occupants: 2 in each

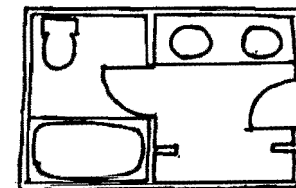
Adjacencies: private area

Furniture: --

Finishes: utilitarian

Equipment: toilet fixture, tub, sinks

POSSIBLE LAYOUT



SPATIAL ANALYSIS

LIVING

RECYCLING CENTER

This is an outdoor space for temporary storage of recyclable materials. It should be secured against animal scavengers.

Size: 30 sq. ft.

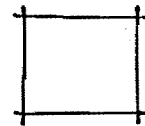
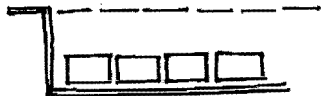
Occupants: --

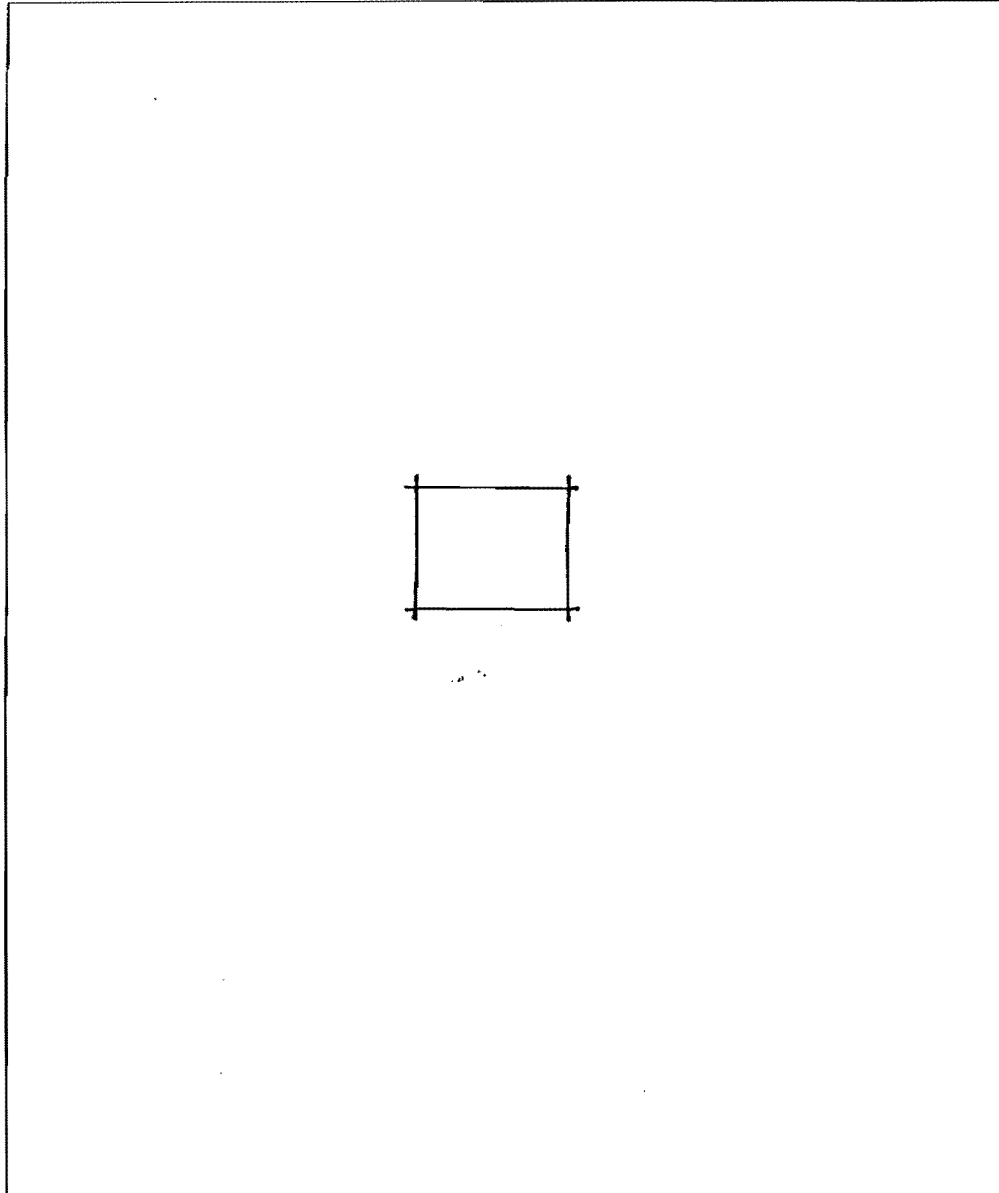
Adjacencies: kitchen

Furniture: --

Finishes: utilitarian

Equipment: large heavy-duty containers





SPATIAL ANALYSIS

LIVING

STORAGE

This is a holding place for scientists' luggage or other personal belongings as well as for those things which 'belong' to the commons area, such as boardgames or equipment.

Size: 50 sq.ft.

Occupants: --

Adjacencies: commons

Furniture: --

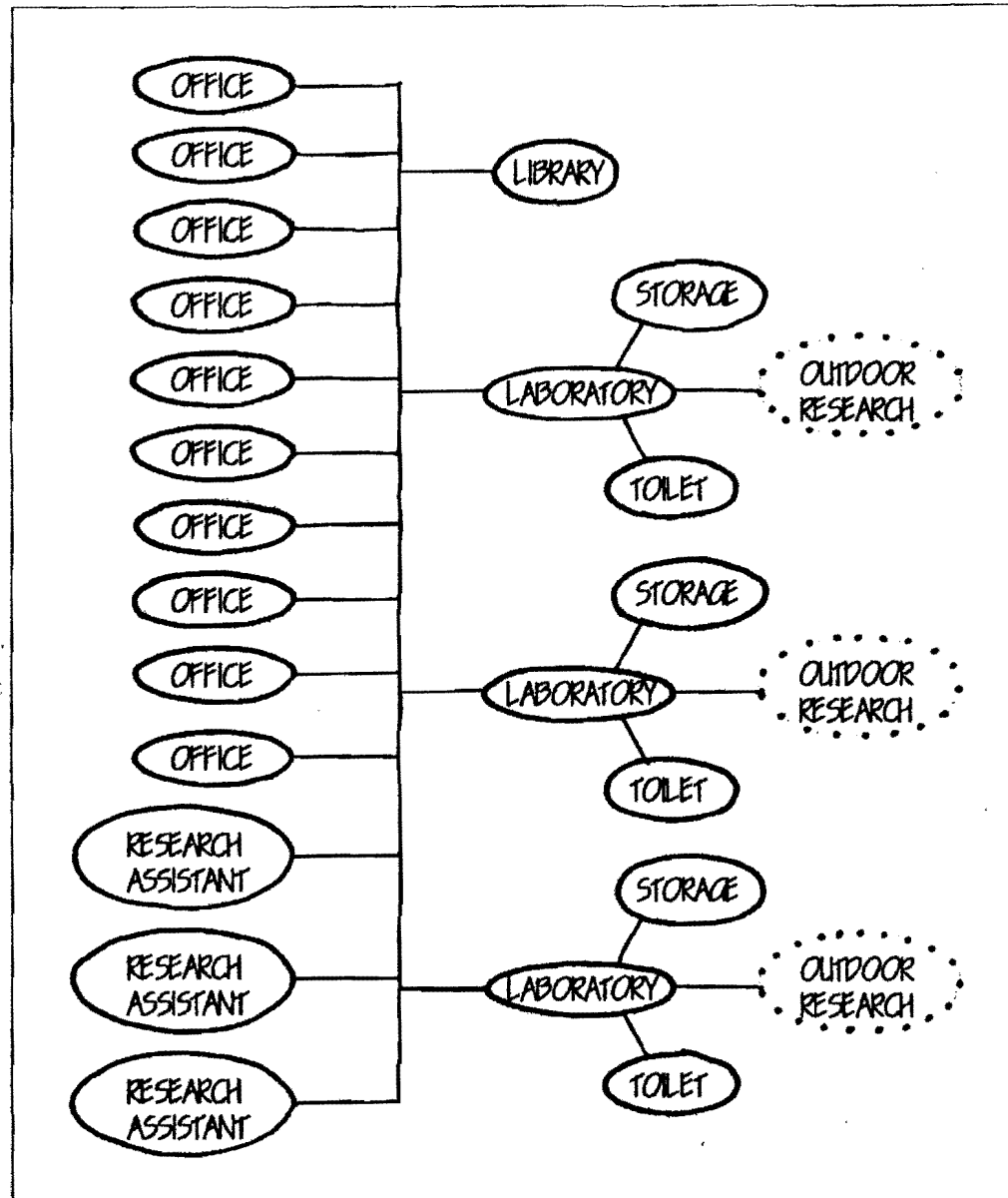
Finishes: utilitarian

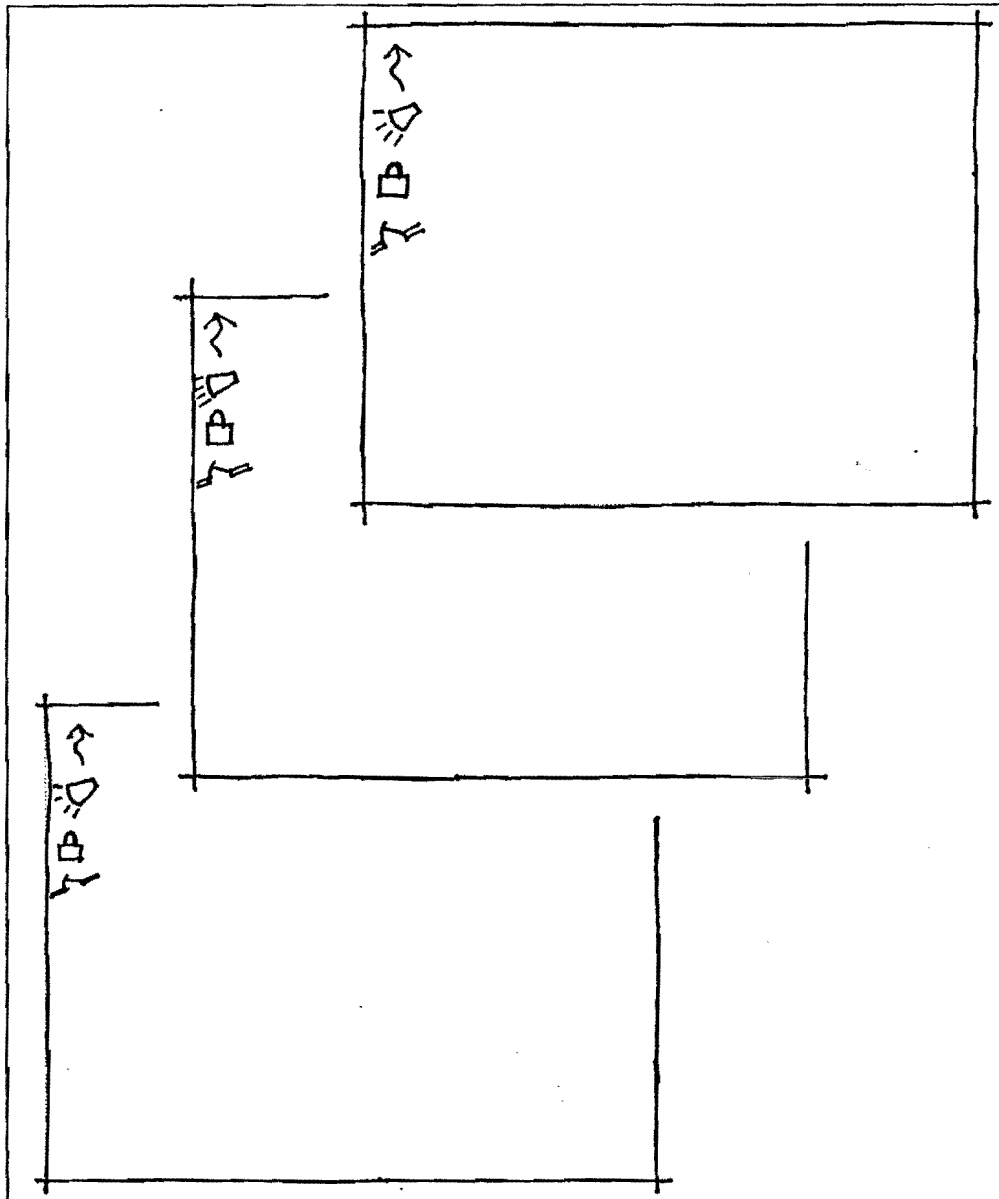
Equipment: shelves, holding spaces, hanging rack

SPATIAL ANALYSIS

RESEARCH

ADJACENCIES





SPATIAL ANALYSIS

RESEARCH

LABORATORIES

These are the primary workspaces for the scientists. All experimentation will take place herein. They should be very flexible due to the variety of research that will take place. Safety should also be a primary concern.

Size: 800 sq. ft. each

Occupants: 3 in each

Adjacencies: offices, outdoor research, toilet, storage, library

Furniture: storage cabinets, chairs, stools, adjustable counters, task-specific lighting

Finishes: utilitarian

Equipment: sinks, gas and oxygen outlets, exhaust hoods, small appliances

SPATIAL ANALYSIS

RESEARCH

RESEARCH PLOTS

These are exterior, but clearly delineated spaces which permit research in a more natural but still controlled environment. They should be completely adaptable to the changing needs of the scientists.

Size: 300 sq.ft. each

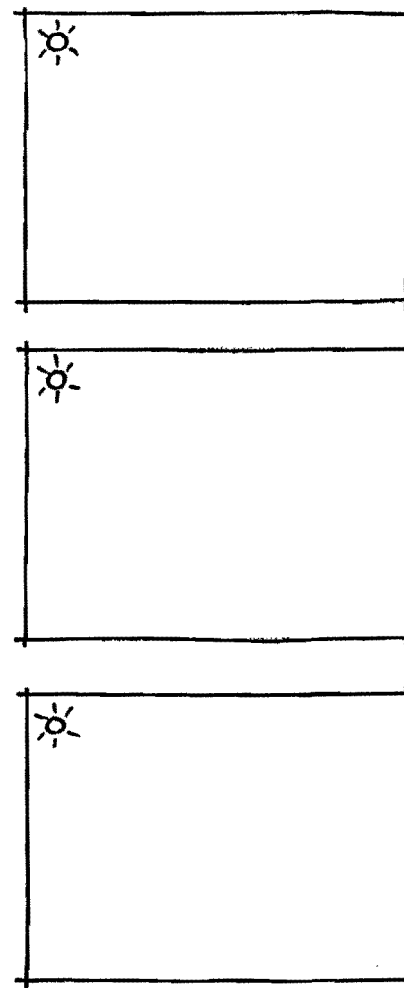
Occupants: --

Adjacencies: laboratories

Furniture: --

Finishes: --

Equipment: adapts to study, must be weatherproof



SPATIAL ANALYSIS

RESEARCH

LIBRARY

This is a reference center for the scientists. It will also be used to store records of their research and therefore may become more open to the scientific public over time. Small conferences, either planned or spontaneous (and virtual or real), should also be accommodated.

Size: 300 sq. ft.

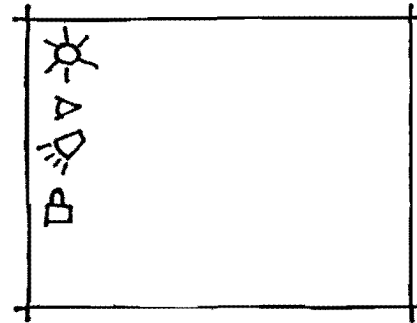
Occupants: 7

Adjacencies: laboratories, offices

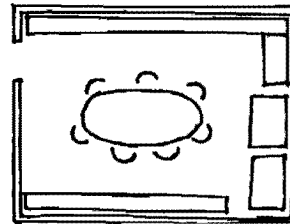
Furniture: book and storage shelves, large table with chairs

Finishes: informal

Equipment: computer terminals, microfiche machine, telephone, VCR



POSSIBLE LAYOUT



SPATIAL ANALYSIS

RESEARCH

RESEARCH ASSISTANTS OFFICES

These spaces will be used by the permanent research assistants for planning and preparation for incoming scientists and for research related to the scientists' work.

Size: 100 sq.ft. each

Occupants: 1 in each

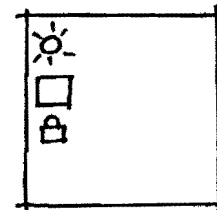
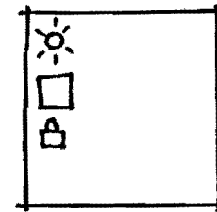
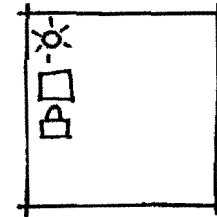
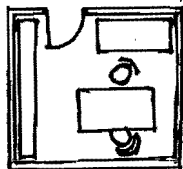
Adjacencies: other offices, laboratories, library

Furniture: shelves, disk, filing cabinet, 2 chairs

Finishes: informal

Equipment: computer, telephone

POSSIBLE LAYOUT



SPATIAL ANALYSIS

RESEARCH

SCIENTISTS' OFFICES

These are individual places of retreat for the scientists to think and study. They should be flexible enough to accommodate the rotations of scientists.

Size: 100 sq.ft. each

Occupants: 1 in each

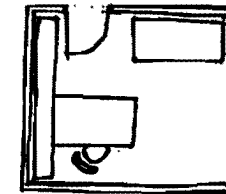
Adjacencies: other offices, laboratories, library

Furniture: desk, chair, shelves and cabinets, additional work space

Finishes: informal

Equipment: computer

POSSIBLE LAYOUT



SPATIAL ANALYSIS

RESEARCH

TOILETS

These serve the scientists and assistants as they work in the laboratories.

Size: 20 sq.ft. each

Occupants: 1 in each

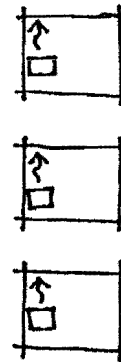
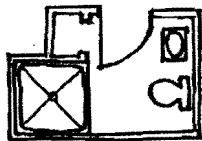
Adjacencies: laboratory

Furniture: --

Finishes: utilitarian

Equipment: toilet, sink, mirror,
emergency shower

POSSIBLE LAYOUT



SPATIAL ANALYSIS

RESEARCH

STORAGE

This is where portable laboratory equipment will be held when not in use. Research assistants will have almost exclusive access to these spaces.

Size: 100 sq.ft. each

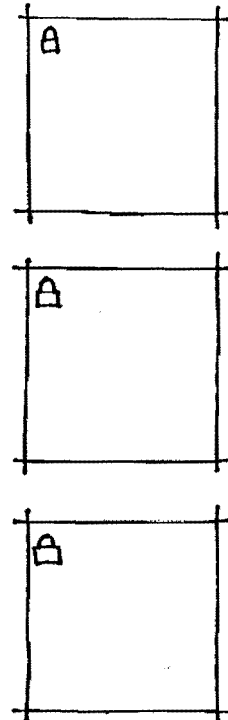
Occupants: --

Adjacencies: laboratory

Furniture: --

Finishes: utilitarian

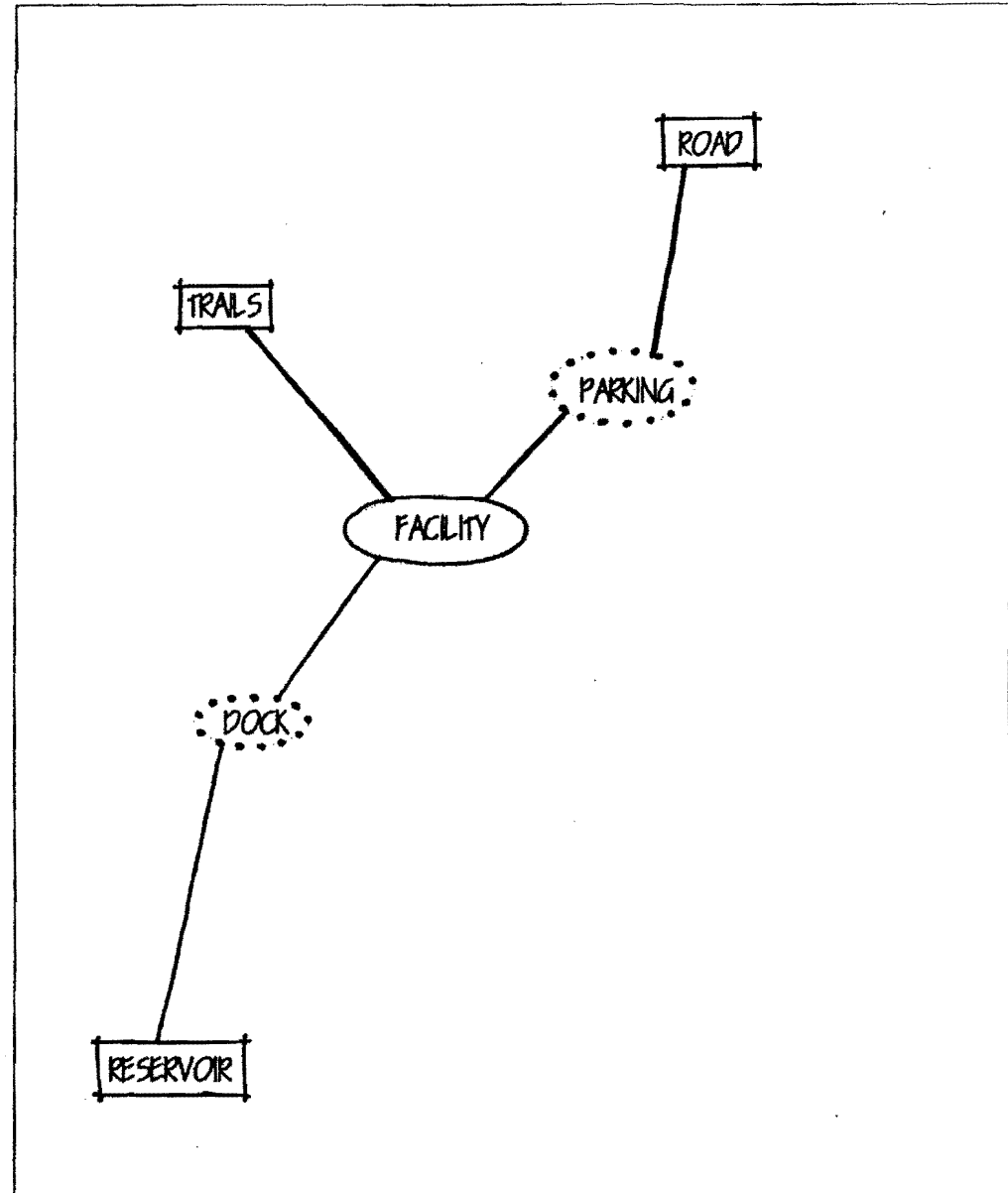
Equipment: shelves, cabinets

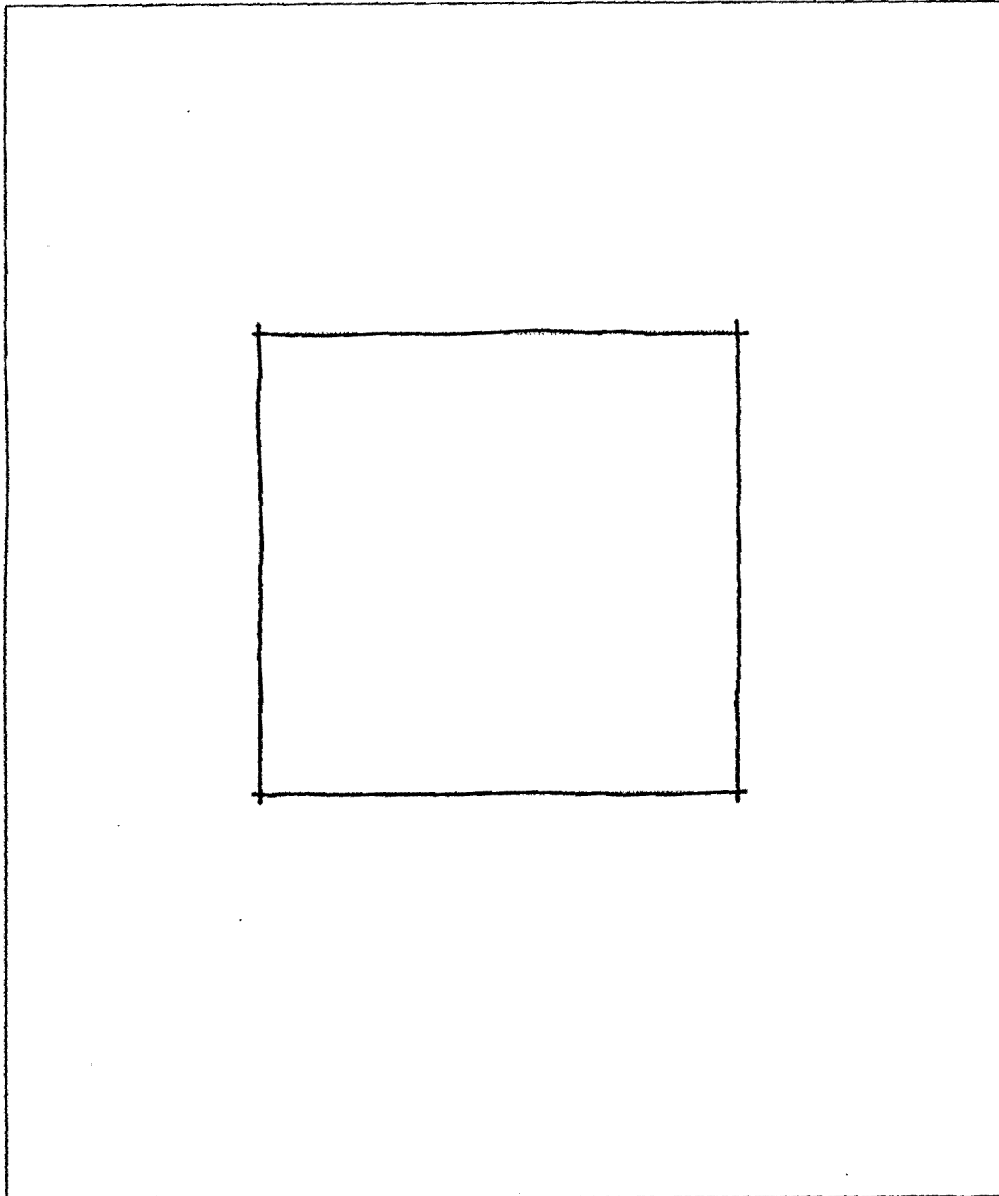


SPATIAL ANALYSIS

EXTERIOR

ADJACENCIES





SPATIAL ANALYSIS

EXTERIOR

PARKING

This exterior space holds vehicles for emergencies or facility services. In order to minimize this space, the resident scientists and employees will park at the nature center and be ferried to this side of the reservoir.

Size: 600 sq. ft.

Occupants: 2 vehicles

Adjacencies: reception

Furniture: --

Finishes: --

Equipment: --

SPATIAL ANALYSIS

EXTERIOR

DOCK

This object connects the facility to the water and thus to the opposite shore. It should provide a place for the barge to connect and for passengers to embark and disembark.

Size: 150 sq.ft.

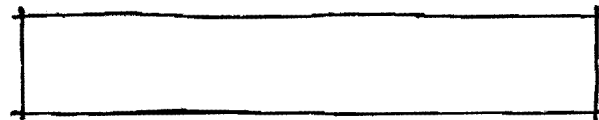
Occupants: --

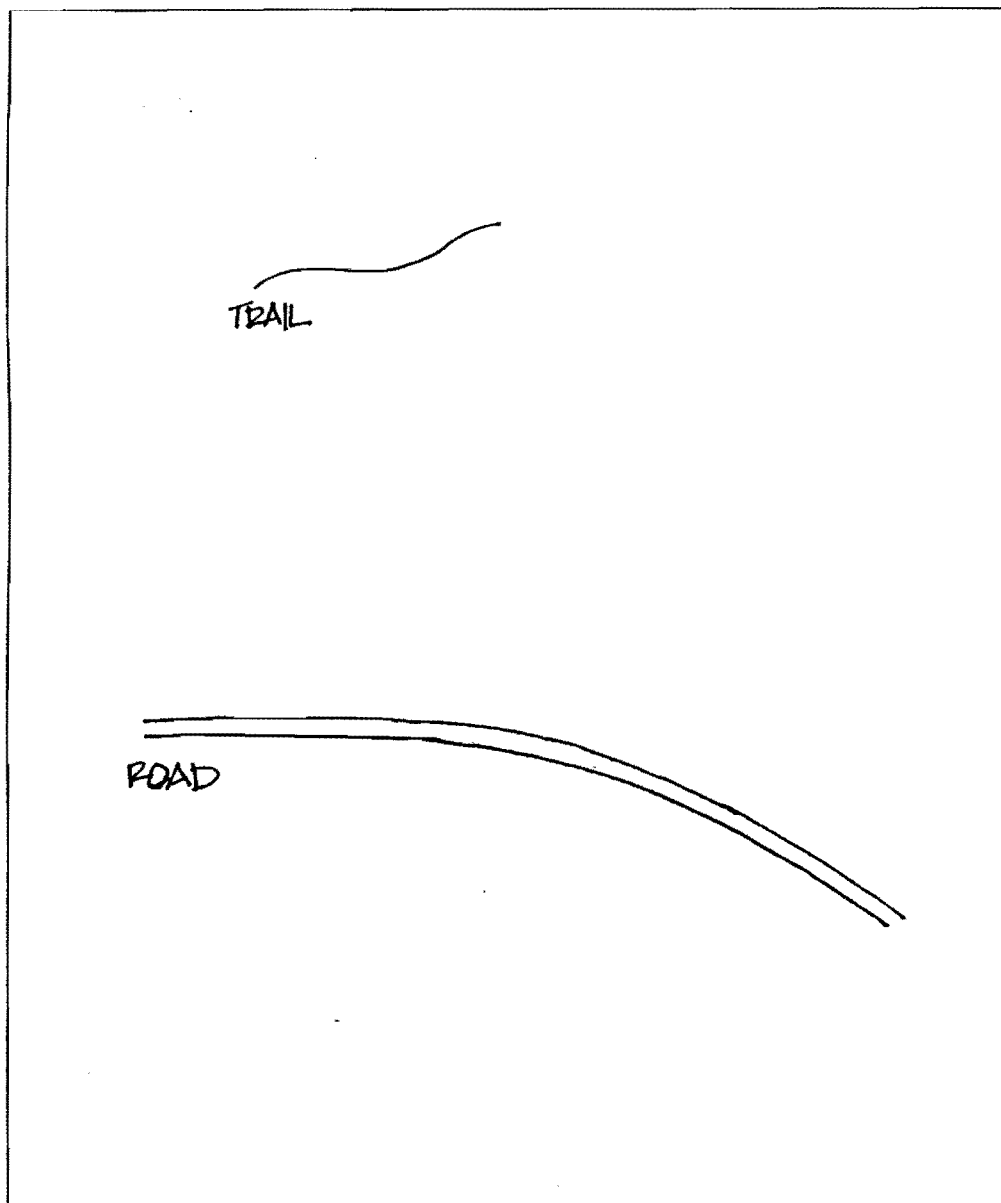
Adjacencies: reception

Furniture: --

Finishes: --

Equipment: docking posts





SPATIAL ANALYSIS

EXTERIOR

CONNECTIONS

The dirt path makes this facility accessible from Holly Loop Trail.

Size: 50 ft.

The new gravel road connects the facility to Lake Road.

Size: 400 ft.

2.4.3

CODE ANALYSIS

OCCUPANCY¹

PUBLIC 305 Business Occupancy - Group B

304.2.2 Assembly occupancies with an occupant load less than 100 persons shall be classified as Group B.

LIVING 311 Residential Occupancy - Group R

311.2 R2: Multiple dwellings where the occupants are primarily permanent in nature . . . dormitory facilities which accommodate six or more persons of more than 2 1/2 years of age who stay more than 24 hours

RESEARCH 305 Business Occupancy - Group B

305.1.2 Group B occupancy shall include, among others, the following: . . .
Laboratories: testing and research (nonhazardous) . . .

CODE ANALYSIS

TYPE OF CONSTRUCTION²

Gross floor area: 10,000 sq.ft.
Grade elevation: approximately 1845 ft.

GROUP B (7690 sq.ft.)

Type V uns.: 2 stories, up to 14,000 sq.ft., 55 ft. height
Type VI unprot. uns.: 2 stories, up to 9,000 sq.ft., 40 ft. height
Type IV 1 hour uns.: 5 stories, up to 25,000 sq.ft., 65 ft. height

GROUP R2 (2120 sq.ft.)

Type VI unprot. uns.: 2 stories, up to 7,000 sq.ft., 40 ft. height
Type V unprot. uns.: 2 stories, up to 12,000 sq.ft., 55 ft. height

TYPE DEFINITIONS

606 Type IV: structural members including exterior walls, interior bearing walls, columns, beams, girders, trusses, arches, floors, and roofs are of noncombustible materials. May be protected or unprotected.

607 Type V: exterior bearing and nonbearing walls are of noncombustible materials; bearing portions of interior walls are of material permitted in Table 600; beams, girders, trusses, arches, floors, roofs, and interior framing are wholly or partly of wood or other approved materials. May be either protected or unprotected.

608 Type VI: exterior bearing and nonbearing walls and partitions, beams, girders, trusses, arches, floors, and roofs and their supports are wholly or partly of wood or other approved materials. May be either protected or unprotected.

All fire resistance requirements are specified in Table 600.

SPATIAL ANALYSIS

The different programatic functions in the program suggests that the facility become several "pavilions" rather than a single, large structure.

Connections should be clear, but more important than any single connection, it is important that visual (and sometimes auditory) communication is maintained throughout all the major spaces without sacrificing the necessary privacy of certain programmatic elements, such as the personal offices.

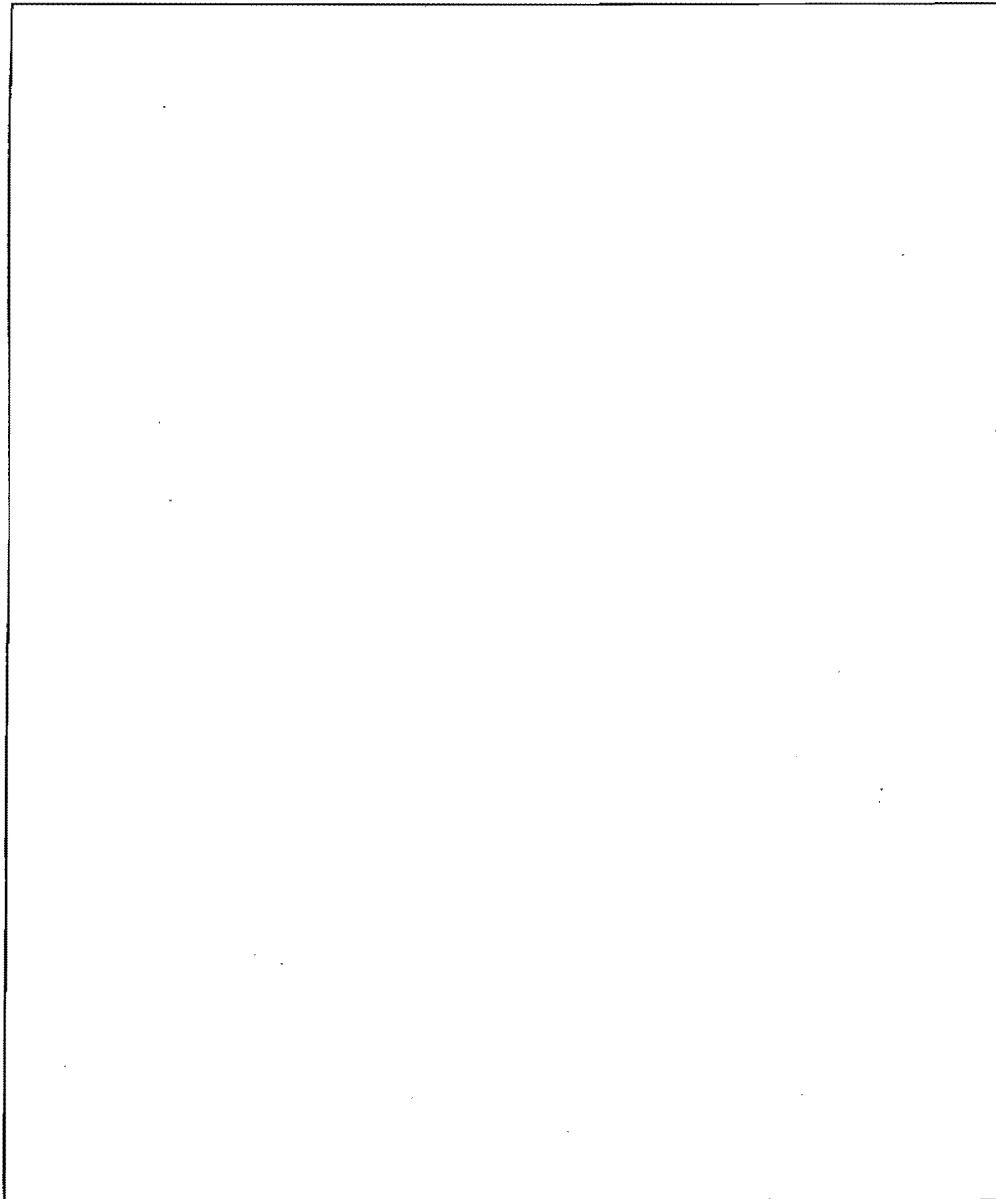
This will be a state-of-the-art laboratory, though somewhat unconventional in terms of program and intent. The presence of alternate functions will influence design decisions within the laboratories, especially concerning such issues as privacy of information and visitor safety.

There is a variety of personal as well as interactive spaces in which to carry on research. The more public spaces are easily accessible and well maintained, so as to draw members of the community and park visitors to this place. Both of these directives are in response to the client's goals.

CONCLUSIONS

... to be able to transcend triviality, to move emotionally, and to lift the spirit to levels that enhance the essence and meaning of life for mankind. This should be architecture.

—Anthony C. Antoniades¹



DESIGN DIRECTION

- 1 ISSUE DEFINITION
- 2 STATEMENT
- 3 PARTI

INDEX

ISSUE DEFINITION

CONTEXT

The building should have a symbiotic relationship with its surroundings--becoming a part of the landscape without disappearing into it.

INTEGRATION



ENVIRONMENT

The facility should have the minimum possible impact on the existing local and global environments.

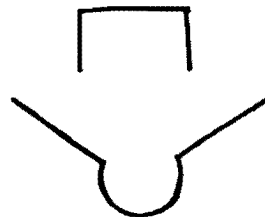
RESPONSIVENESS



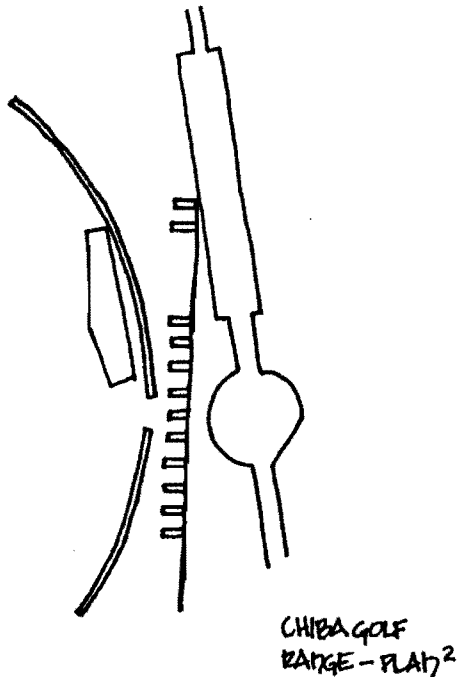
COMMUNICATION

The facility should foster both spontaneous and organized exchanges of information.

OPENNESS



STATEMENT



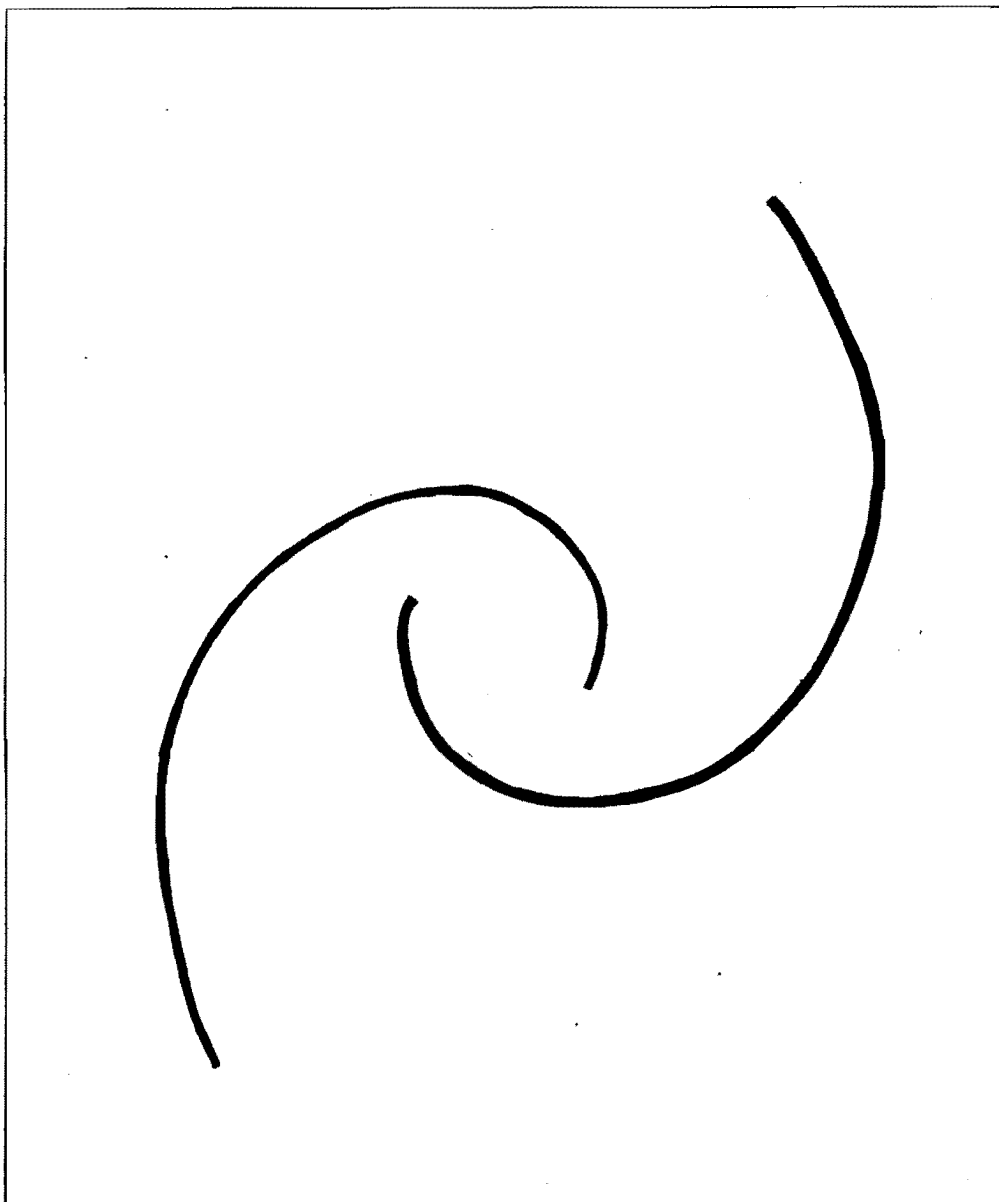
Humans need to feel that they belong in a place. We need to have a connection--some would say a communion--with our surroundings. In the built environment, we often sacrifice this greater sense of integration with a *space* for the false security of *place* identification. Simultaneously, or perhaps consequently, our buildings begin to lose their connections with the earth, which exacerbates the experiential loss. And so we begin to mimic nature and the natural, until the building is indistinguishable from its surroundings. Again, we have not established an identifiable link with the landscape: this time because we have entirely merged with it. What is needed is an architecture that is distinctly human but directly responsive to nature--much like a flower or a tree that is simultaneously a distinct entity and an inextractable part of the whole.

Like the flower or tree, a building must also maintain a *symbiotic*, rather than parasitic, relationship with its surroundings. The way it affects the environment, both locally and universally, determines the degree to which it is truly compatible with its environment. There should be an exchange of elements, with both the building and the environment contributing to the functions of the whole ecological system.

And so, we establish two approaches to what is fundamentally one issue: site responsiveness in terms of so-called "contextualism" and in terms of (for lack of a less trite description) "sustainability". But there is a step beyond these: the step in which the facility becomes simply another eco-system in the existing environment of the park. At this point, the building begins to generate a *phenomenological sense of belonging* that supersedes program. This is the goal.

Certainly, no one would argue that Miralles Pinos' Archery Facility disappears into its surroundings, and yet the distinction between built and natural forms is ambiguous. The same is true, to less of an extreme, of Morphosis' Chiba Golf Range in Japan. The architecture becomes an *integrated* part of the landscape, and not only on the surface. The forms do respond well to the landscape, but the systems also smoothly connect to their environment. Much like Antoine Predock (see side bar, facing page), Morphosis develops a "strategy that links the site investigation to a coherent and responsive architectural language."²

A philosophical direction such as this suggests a certain realization of form that is much like that of nature, but distinctly human. The building(s) will "evolve" as a series of additive forms in contrapuntal rhythm. The repetitive and technological nature of the program also lends itself well to such a methodology.



PART I

"Rather than transform the site, I want to make the [building] an extension of its surroundings. It's a seamless event between land and design."

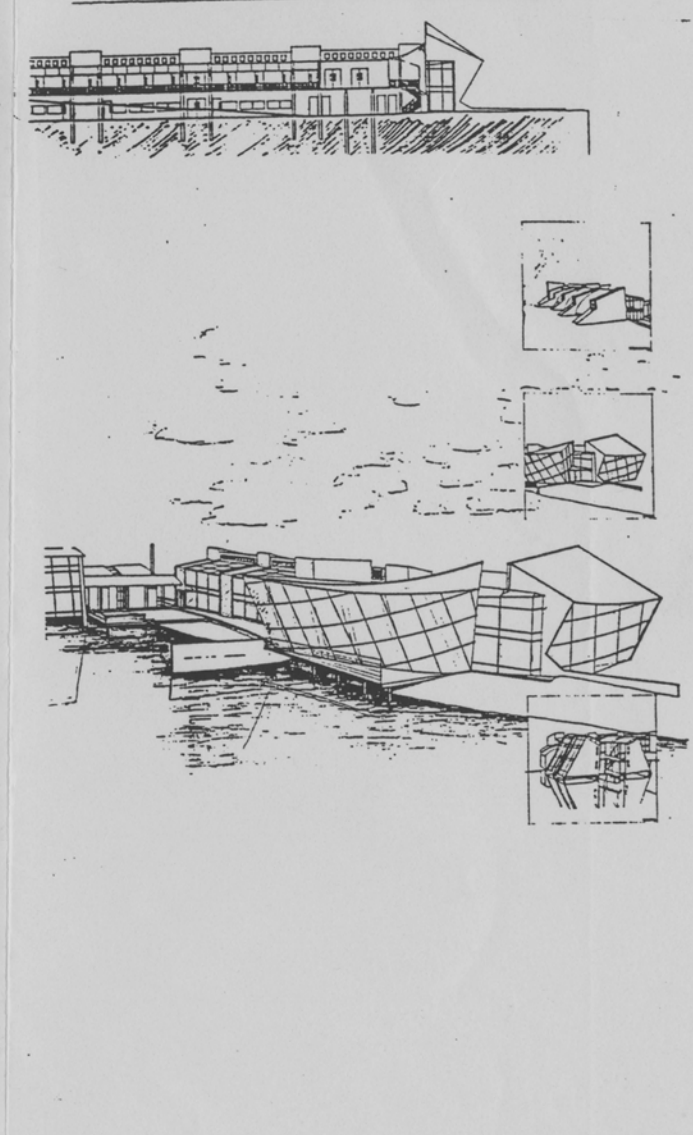
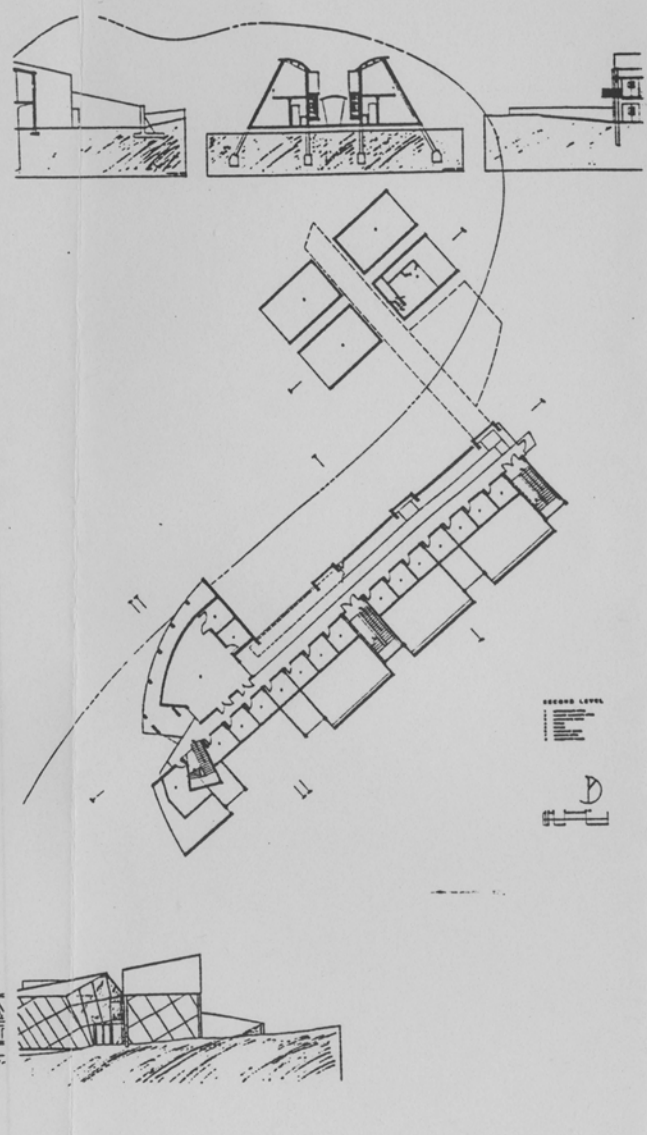
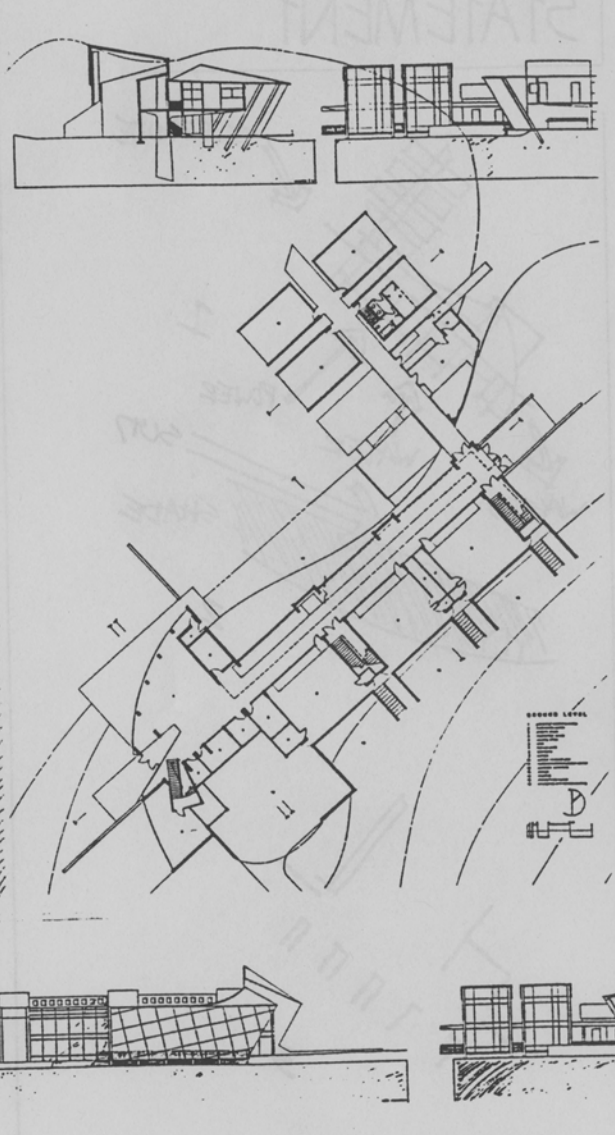
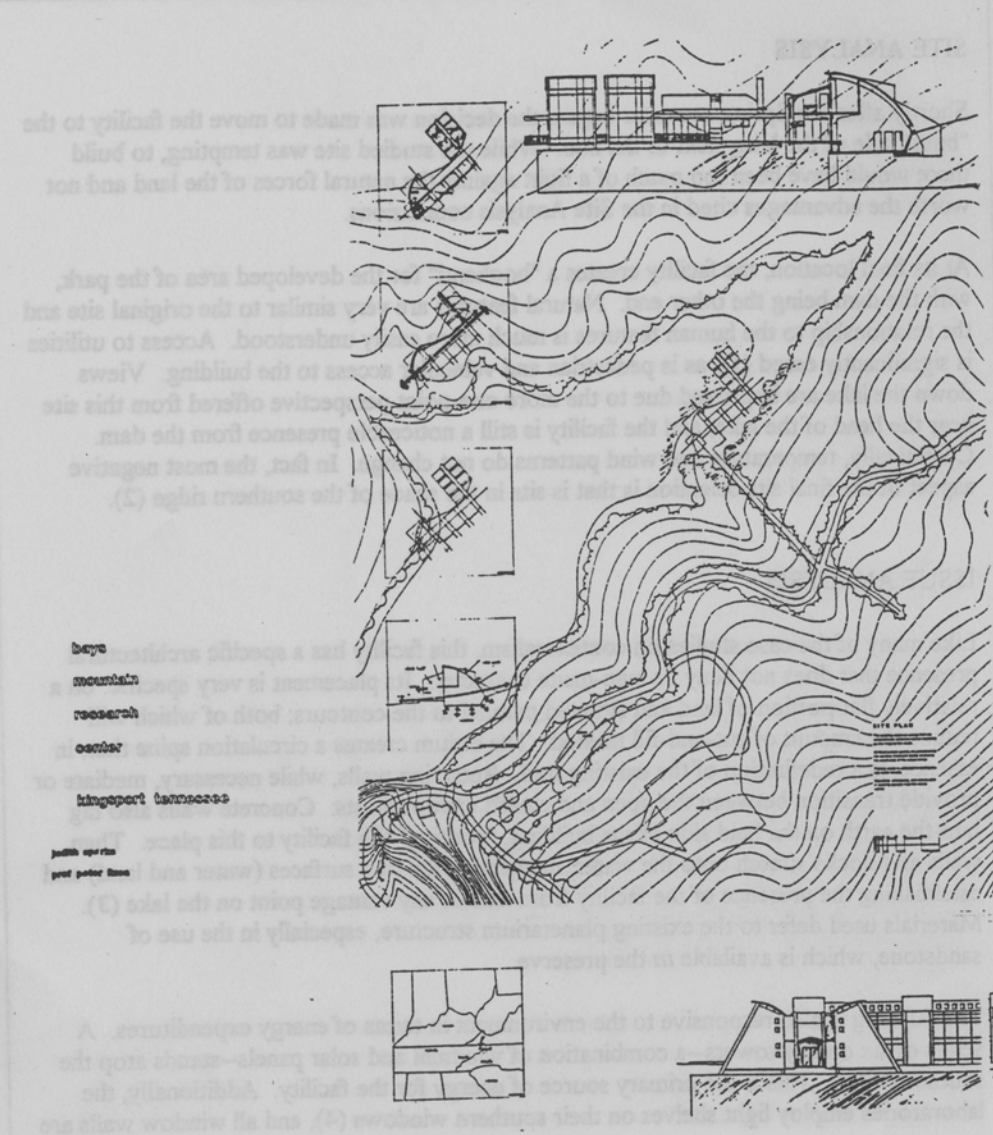
--Antoine Predock³

DESIGN RESPONSE

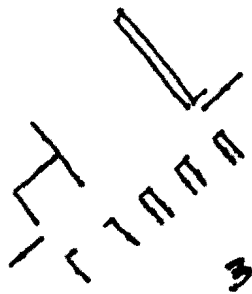
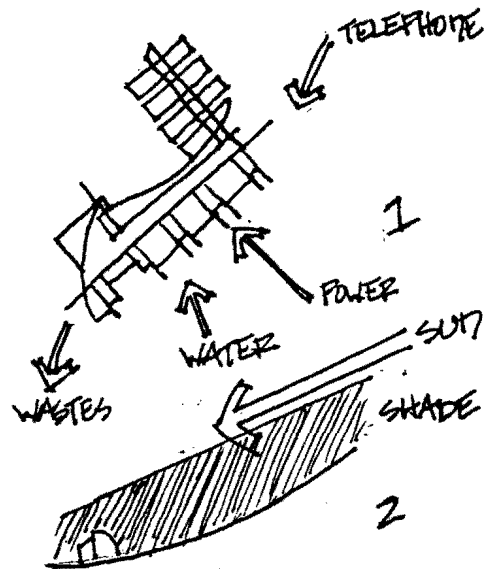
- 1 FINAL DESIGN DRAWINGS
- 2 RESPONSE STATEMENT
- 3 MODELS
- 4 A STUDY IN CONTEXTUALISM

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DRAWINGS



STATEMENT



SITE ANALYSIS

Shortly after the Spring semester began, the decision was made to move the facility to the "built" side of the lake, next to the zoo. While the studied site was tempting, to build there would have been too much of a fight against the natural forces of the land and not worth the advantages cited in the Site Analysis conclusions.

At its final location, the facility creates a "bookend" for the developed area of the park, with the dam being the other end. Natural features are very similar to the original site and the relationship to the human features is much more easily understood. Access to utilities is significantly eased (1), as is pedestrian and vehicular access to the building. Views down the lake are improved due to the more one-point perspective offered from this site near the head of the lake, and the facility is still a noticeable presence from the dam. Climatically, temperature and wind patterns do not change. In fact, the most negative aspect of the final site selection is that it sits in the shade of the southern ridge (2).

ISSUE ANALYSIS

Like many of the case studies on contextualism, this facility has a specific architectural presence that does not deny its man-made character. Its placement is very specific: on a relatively flat portion of land and situated parallel to the contours; both of which will reduce the amount of cut-and-fill needed. The atrium creates a circulation spine that, in essence, is a redefinition of the existing trail. Retaining walls, while necessary, mediate or provide transition between the open and closed environments. Concrete walls also dig into the earth on the land side of the building, "rooting" the facility to this place. Then, walls and docks stretch onto the water, integrating the two surfaces (water and land) and establishing the presence of the facility from almost any vantage point on the lake (3). Materials used defer to the existing planetarium structure, especially in the use of sandstone, which is available in the preserve.

The building is also responsive to the environment in terms of energy expenditures. A series of six energy towers—a combination of windmill and solar panels—stands atop the southern ridge. This is the primary source of energy for the facility. Additionally, the laboratories employ light shelves on their southern windows (4), and all window walls are

composed of low-E glass, including the atrium, reception area, and housing units. Foundations are discontinuous in an effort to reduce the impact of the facility on subterranean life and be less inhibitive to the natural drainage patterns of the site and surrounding areas.

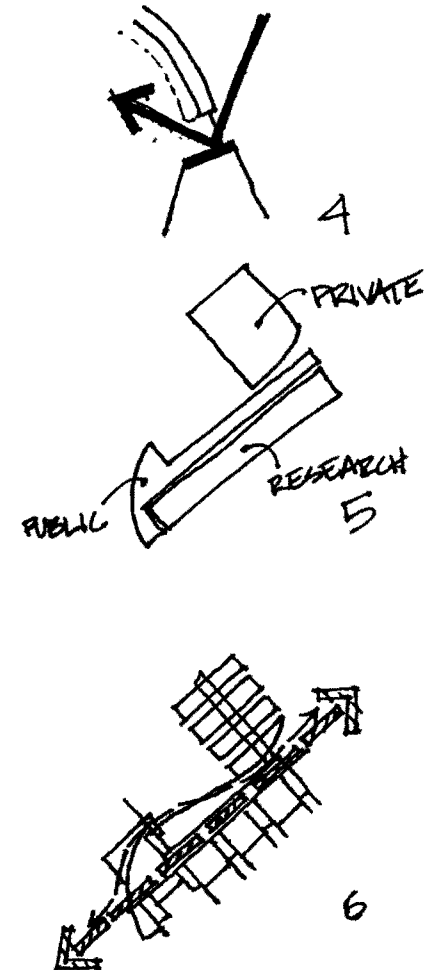
Several moves were made to facilitate communication between the users of the building. Scientists must travel upstairs from the laboratory spaces to the offices; the intention is that they meet and stop to chat in transit. The atrium also provides "pausing points" at the concrete walls in the form of "living" spaces with seating, etc. Their private commons room and the multi-media room also create opportunities for conversation. In addition, the simple fact that the scientists share lab spaces should aid in the exchange of information.

SPATIAL ANALYSIS

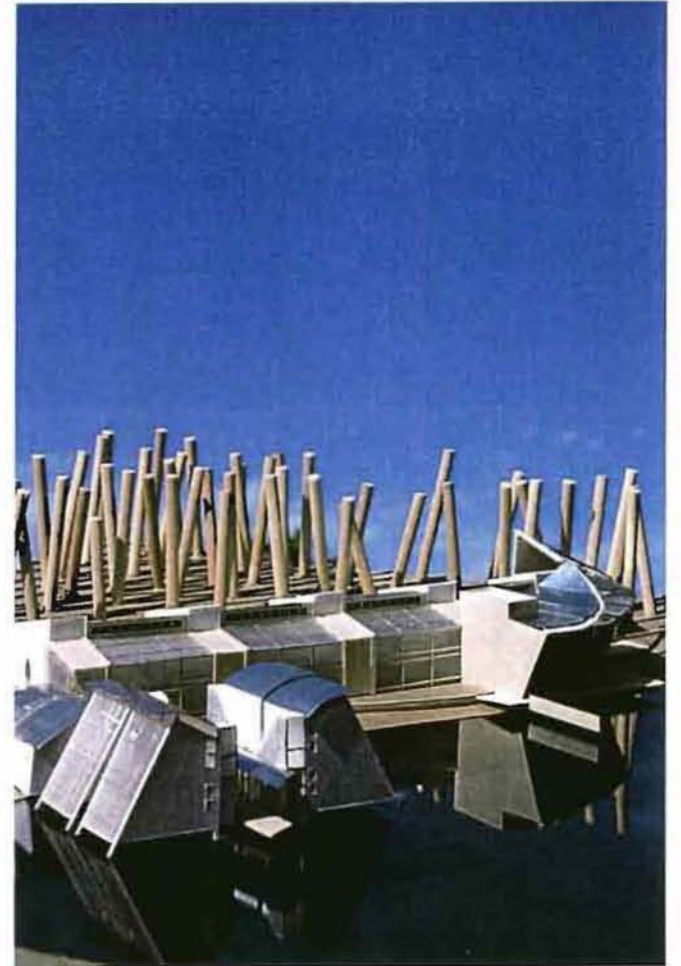
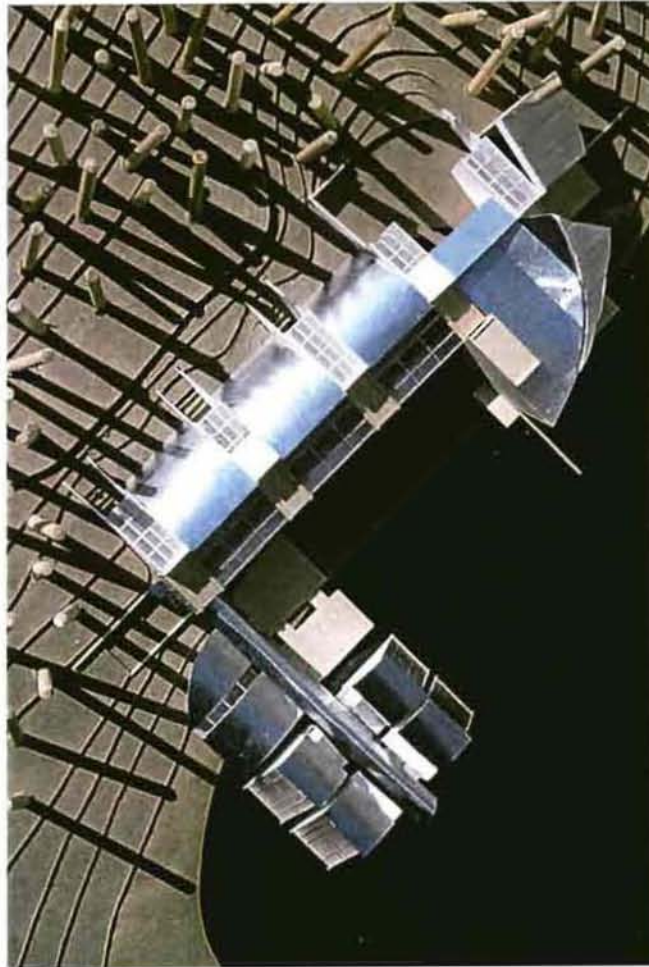
The facility did evolve into certain "zones" of usage: public, research, and living (5). The open staircase/entry complex, the openness of the atrium, and the abundance of windows facilitate visual connections and a clear understanding of the layout of the building. Visual connections are further enhanced by the observation windows connecting the atrium and offices to the laboratories.

Visitors are drawn through the facility as the path becomes enclosed by structure, but the circulation path is so clear that they will not become disoriented (6).

STATEMENT



MODELS





MODELS



3.2