



Records related to the establishment
of the Minnesota Valley National
Wildlife Refuge

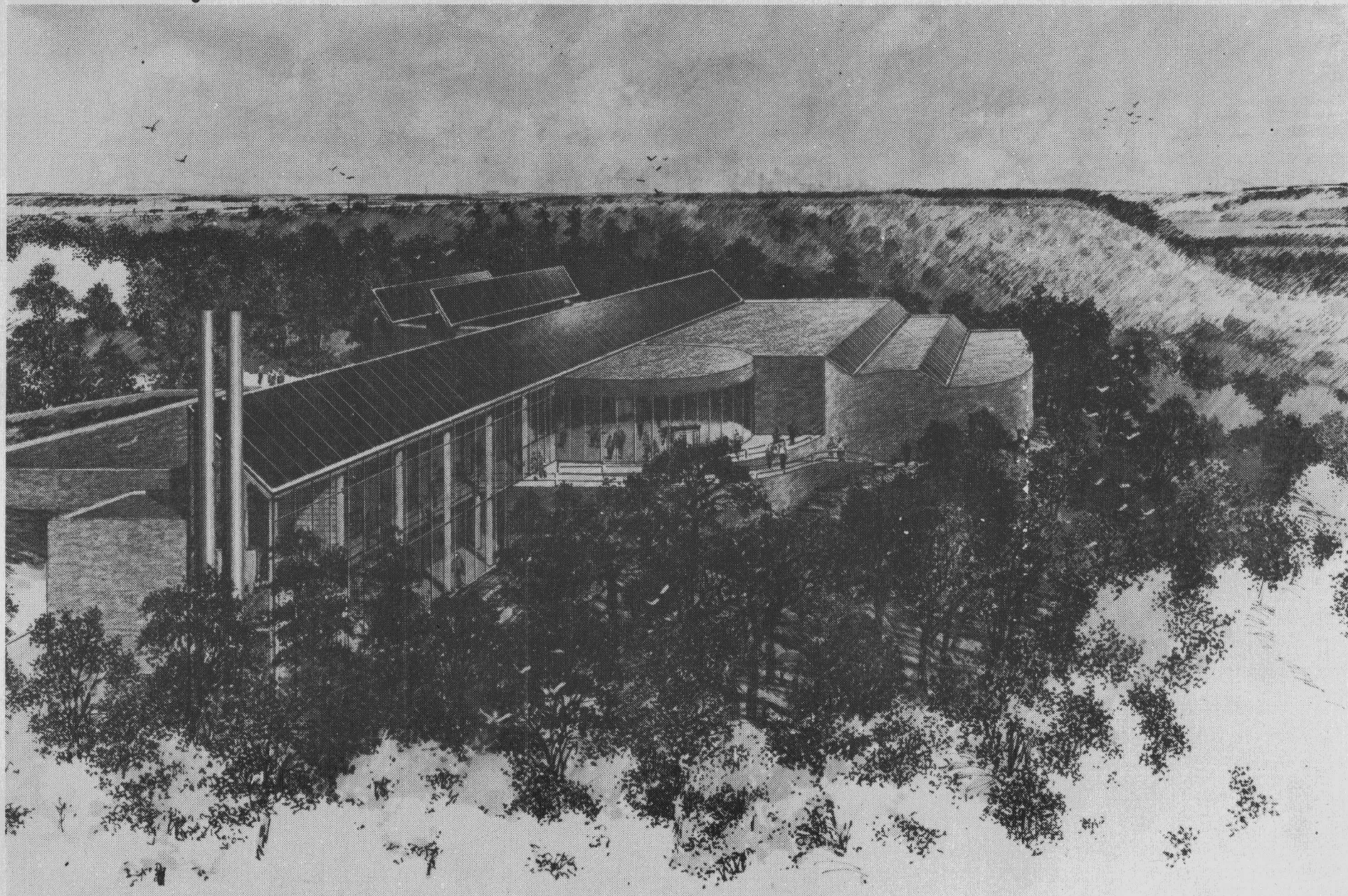
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Wildlife Interpretation and Education Center Minnesota Valley National Wildlife Refuge

Bloomington, Minnesota



January 14, 1980

Mr. David W. Gustafson
United States Department of the Interior
Fish and Wildlife Service
Federal Building, Fort Snelling
Twin Cities, Minnesota 55111

Dear Mr. Gustafson:

In accordance with our agreement of July 1980, we hereby submit the planning document for the Wildlife Interpretation and Education Center, Minnesota Valley National Wildlife Refuge. The purpose of the document is to provide a comprehensive view of the scope of the center.

This summary report contains a brief review of the project's progress. The next phase of the work is anticipated to be design development of the total concept, followed by detailed data for project implementation.

We have enjoyed working with you and your people at Fort Snelling as well as the Refuge staff and look forward to a continued association in the future phases of the project.

Sincerely yours,

Frank E. Brust
Project Manager
Ellerbe Associates, Inc.
Bloomington, Minnesota

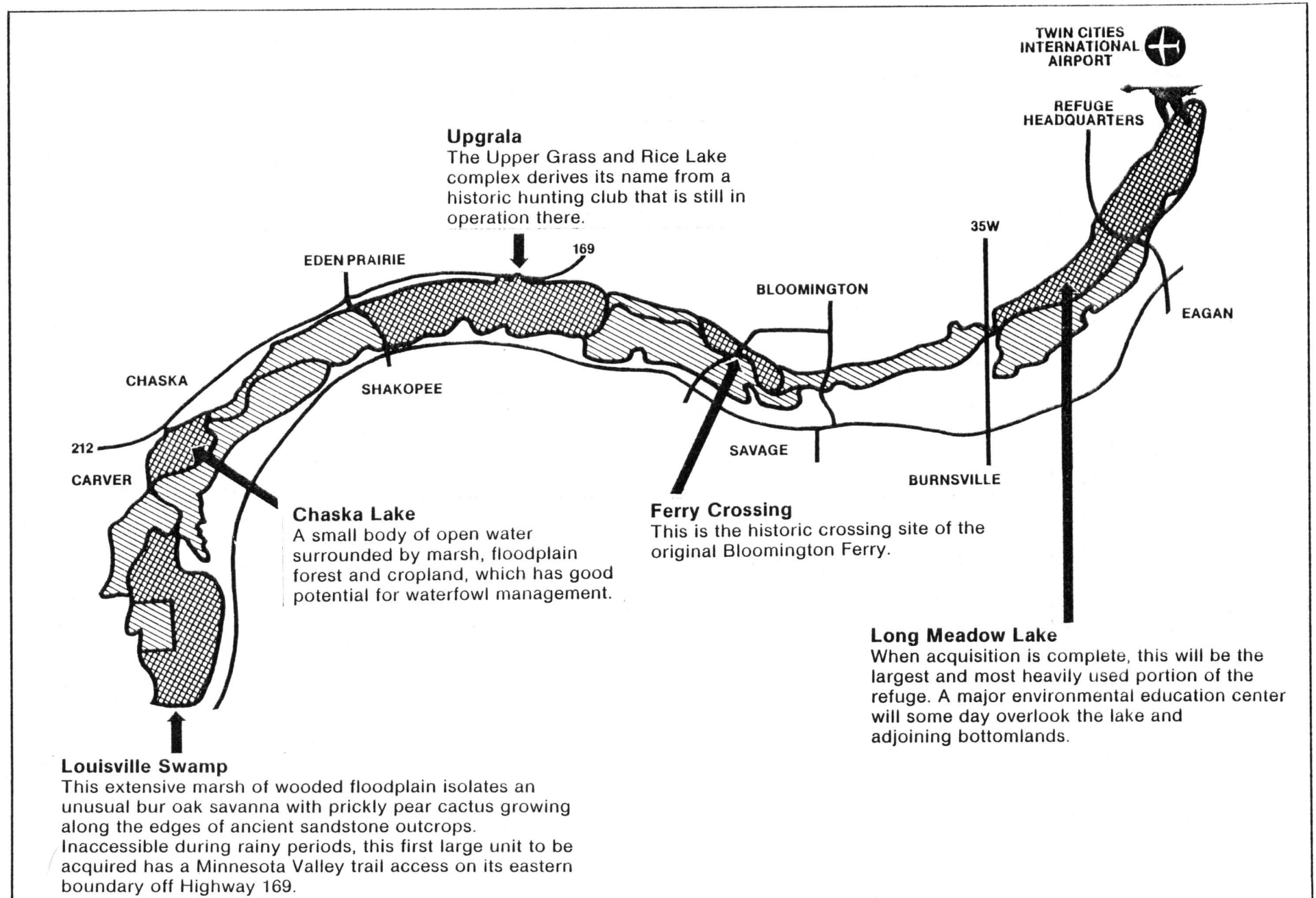
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Feb/JM

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The Refuge



Part I: Introduction

Establishment of the Refuge

The 94th Congress, on October 8, 1976, passed Public Law 94-466, which established the Minnesota Valley National Wildlife Refuge. The Law states the following:

“(c) WILDLIFE INTERPRETATION AND EDUCATION CENTER - The Secretary shall construct, administer and maintain, at an appropriate site within the refuge, a wildlife interpretation and education center. Such center shall be designed and operated to promote environmental education and to provide an opportunity for the study and enjoyment of wildlife in its natural habitat.”

The Wildlife Refuge extends from Fort Snelling State Park upstream for some 36 river miles to Carver Rapids, near Jordan. The area's width varies, but generally follows the defined limits of the flood-plain.

The law authorizes the acquisition of about 9,500 acres of refuge lands by the U.S. Fish and Wildlife Service. In addition, the State of Minnesota will acquire adjacent wildlife-recreation area lands. The law also requires that the Minnesota Valley Trail Corridor, authorized by Minnesota Statute in 1969, be planned as an integral part of the refuge and recreation area.

The refuge was established by the U.S. Congress to recognize the values of wildlife habitat preservation, environmental education, and close-to-home recreation, all of which have taken on added importance with the changing national energy situation of the 1980s.

Background of the Project

The Minnesota Valley National Wildlife Refuge Act calls for the development of education and recreation opportunities for "hundreds of thousands of urban dwellers" and requires the Secretary of the Interior to construct, administer, and maintain a Wildlife Interpretation and Education Center. The Center shall be designed and operated to promote environmental education and to provide an opportunity for the study and enjoyment of wildlife in its natural habitat.

This is consistent with the environmental education mission of the Department of the Interior which aims to "advance and exemplify the principles and practices of sound ecosystem management" and create "an informed public who will understand the need to safeguard its life supporting ecosystems as well as the individual cultural and natural resources of which they are comprised".

Collectively interpreting these mandates and guidelines, it is clear that the envisioned "Wildlife Interpretation and Education Center" -- the only facility of its kind -- could provide comprehensive services and programs for the entire spectrum of audiences in the Twin City metropolitan area and for visitors from all parts of the country. It could help people learn to make choices which will favor their long-term survival in diverse, healthy and productive surroundings.

Potential Audience

Two million people live within a half-hour's drive or bus ride of the Center site. This means that programs can be developed for those who don't ordinarily have opportunities to visit the nation's wild lands or to see its wildlife. It means that, though reduced travel distance and use of mass transit, people can save fuel and money by enjoying wildlife-oriented outdoor recreation closer to home. But most important, it means that ecological principles can be taught through university research projects, program assistance to 500 local primary and secondary schools, all-age community education efforts, and a variety of communications media.

In addition to the projected growth in demand from traditional recreationists, a tremendous potential exists for drawing visitors from several thousand nearby hotel rooms and from the adjacent international airport where hundreds of people are laid over for several hours between flights each day. The current use at the airport is 5.4 million passengers per year and expected to go to 23 million by the year 2000. By providing Interpretive Center program attractions, publicity and perhaps shuttle service, non-traditional types of visitors can be added to other public service program clientele.

Another major audience will consist of educationally motivated groups, represented primarily by local learning institutions. As part of a survey of local needs for educational assistance, preliminary findings indicate that outreach services to local teachers could generate over one-half million student activity hours of wildlife-related learning experiences in the classroom as well as on outdoor learning sites each year.

Many of the groups falling into the educational audience category will consist of handicapped individuals or other representatives of special populations. Providing services to this special population requires information dissemination on availability of appropriate sites and facilities, low cost transportation and equipment rental, removal of physical barriers and design of appropriate facilities for "mainstreaming" varied user groups, with innovative programs and outreach services using staff trained to work with special groups.

Strategic Location of Proposed Center

The refuge will be the only major federal facility of its kind in this region and is already considered among the top two or three potential urban "showcase" wildlife refuges in the nation. The proposed center will be located near major intersections of freeways and corridor trail systems. It will be within ten minutes' taxi time of the international airport where thousands of people get held over for several hours each week. It will be within twenty minutes or less of several major hotels on "the strip" in Bloomington, Minnesota and the center of the metropolitan population distribution. This combination of vacationers and transients off the freeways, recreation trail users, hotel and airport layovers, metro area residents, special populations, and official groups constitute a potentially huge pool of demand for facilities and programs.

Access to Proposed Center

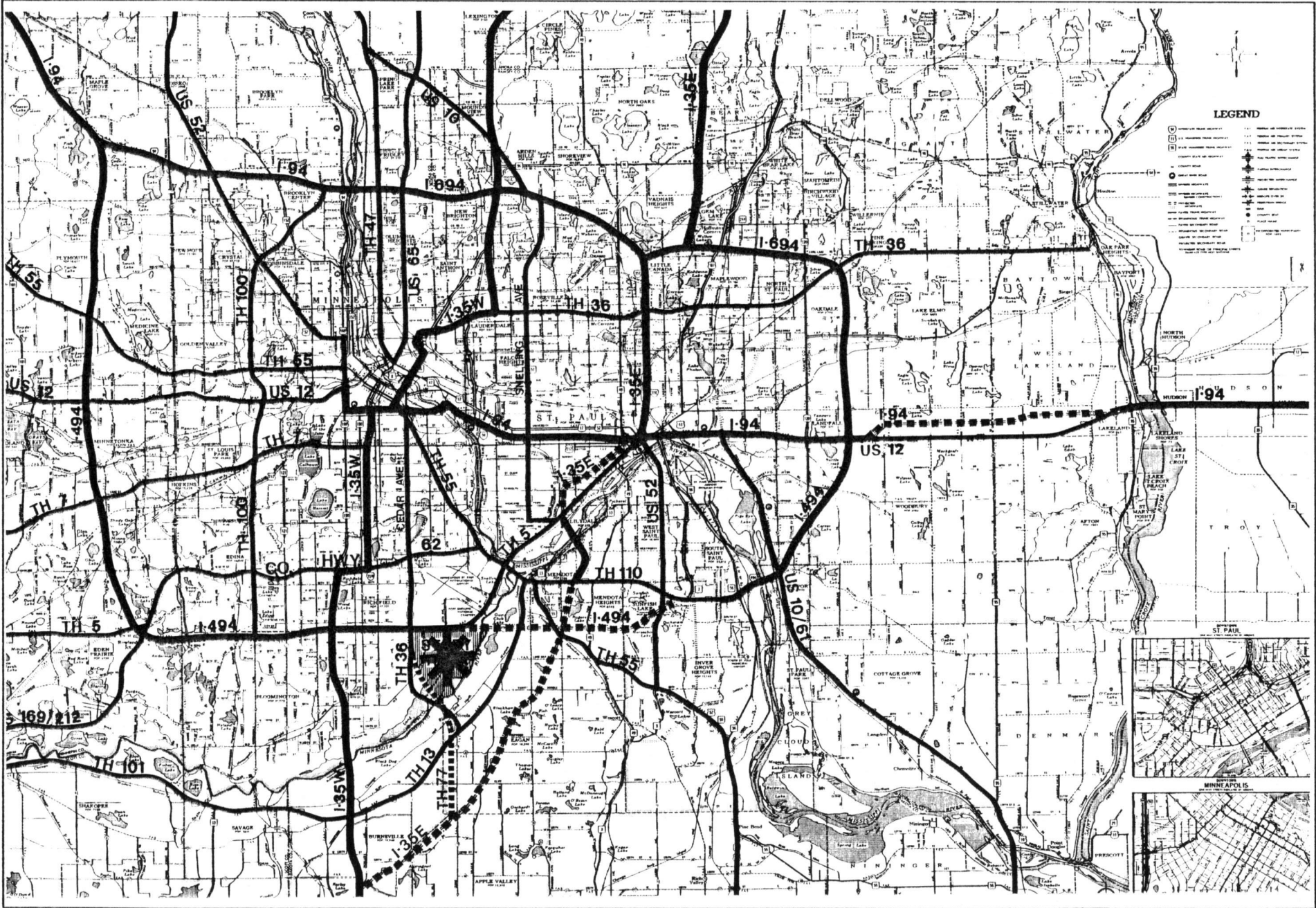
Geographically, the proposed center is well located with regard to population and the regional market area. The Twin City International Airport provides optional national and international connections with shuttle service to hotels within easy walking distance of the proposed center. The major State Highways and Interstate Freeway System make this location convenient to all persons in Minnesota and surrounding state market areas including parts of Iowa and Wisconsin, North and South Dakota.

The visitor center site has direct accessibility to almost all parts of the metropolitan area as well as the state and upper midwest region through a converging network of Interstate, Federal and State Trunk Highways from the north, west and south. These highways have access to or interchanges with the Metropolitan 494/694 Interstate belt; therefore, traffic and travel delays within the central cities and at the first tier of suburbs can be circumvented to allow arrival at the center site before having to exit the Interstate System.

The proposed center site is one of the few bluff sites that has a grand view of a Minnesota Valley floodplain lake with direct trail access to the river. This will allow visitors to enter the center, then proceed directly into the natural environment of the river valley via connecting trail links to the Minnesota Valley State Corridor Trail.

A park and ride bus facility is located at 24th Avenue and East 80th Street. Three existing transit routes utilize the 24th Avenue park and ride facility. One of these stops 1/4 mile east of the center site, served by the downtown Minneapolis and airport express bus which operates during weekday morning and evening rush hours.

Bloomington Site Plan



Land Use

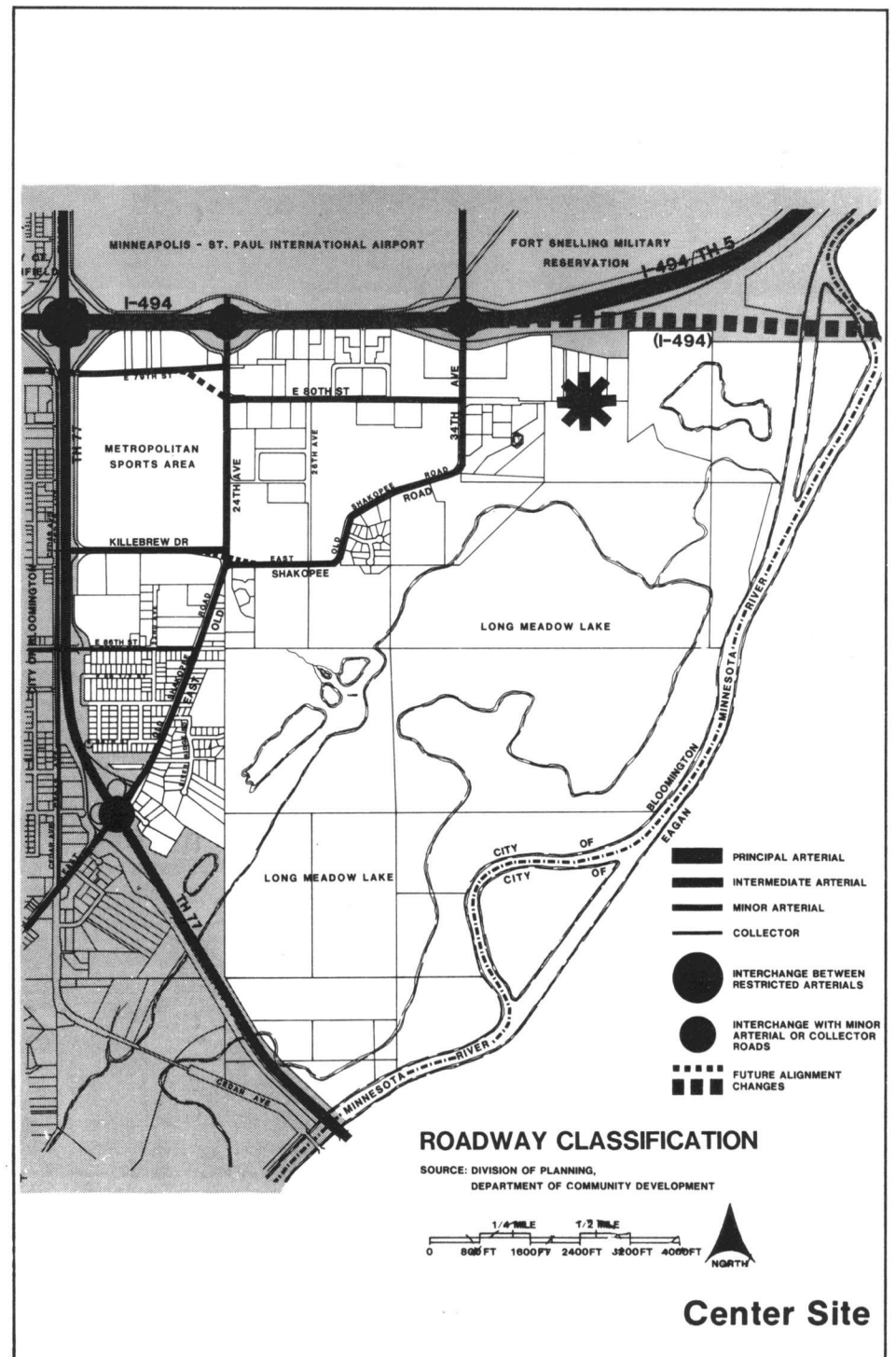
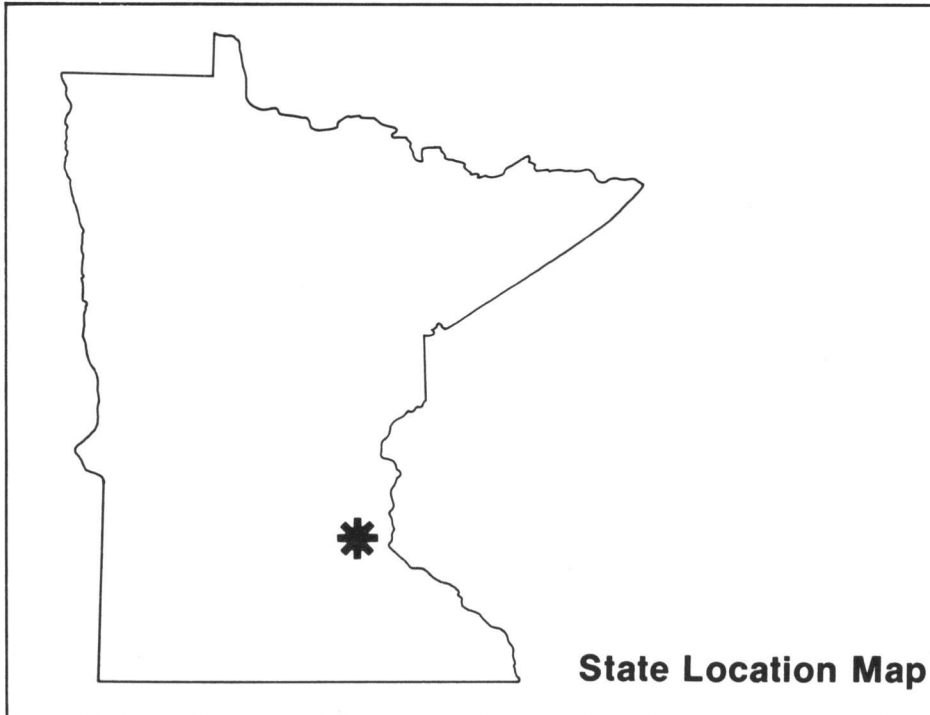
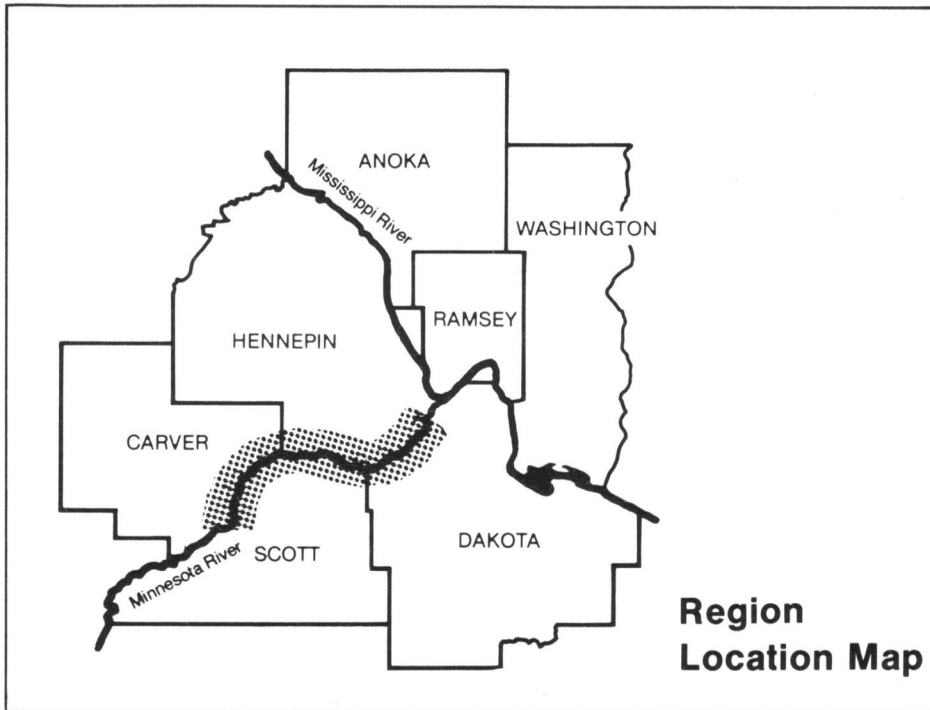
The center site is situated in northeast Bloomington, an area characterized by established and stable land uses. The site is generally located in the southeast quadrant of the interchange of I-494 and 34th Avenue. These highways/streets are major boundaries, providing separation of major land uses and attractive areas for highway-oriented uses.

The area to the north of I-494 and to the east of Cedar Avenue is devoted entirely to the Minneapolis/St. Paul International Airport and the Fort Snelling National Cemetery.

Immediately to the west of the site is the large Control Data Corporation manufacturing and office complex and the Appletree Square office highrise. Several apartment complexes and several small single-family residential areas are beyond the office complexes as well as several hotels and offices typical of the high-quality development on the "Bloomington/I-494 strip". South of the center site lies the wetlands associated with the Minnesota River. These wetlands are currently being acquired for the Minnesota Valley National Wildlife Refuge.

Natural Setting

Despite its highly urbanized location, the center site is remarkably natural and serene with a variety of wildlife commonly being seen including numerous small birds and mammals, deer, fox, and migratory hawks, owls, ducks, geese and an occasional eagle. Mature trees shield the bluff overlook from the sounds and sights of the airport and busy roadways. The view of the valley is basically natural with only a few man-made structures visible on the distant horizons.



Site Photo



Part II; Objectives

Goals: Management/Education Interpretation/Recreation

1. It will communicate to the public an understanding of wildlife management activities.
2. a. It will provide a forum for examination of the visitors role as a steward of the resource, and it will provide a place for the exchange and development of ideas about potential problems and solutions to wildlife resource problems.

b. It will be a focal point for wildlife/environmental education activities - a place where a multitude of educational/recreational and interpretive activities radiate out to other parts of the Minnesota Valley Wildlife Recreation/Refuge Area.

c. The Center will act as a library of information about the river valley - a place where persons or groups can come to do research or obtain information probably not readily available elsewhere.

d. The Center will provide intern opportunities for scholars, and opportunities for those wishing to share their knowledge and understanding with others.

e. The Center will use interpretive displays, information and orientation devices which interpret the area, its wildlife and wildlife management techniques.
3. a. It will provide the public (be it casual visitor or serious scholar) with an opportunity to learn about the Minnesota River Valley as a natural resource with an emphasis on wildlife, and to become aware of how people can enjoy the refuge/valley.
4. a. In summary, the center will provide a means through which it can foster an appreciation of the Minnesota River Valley wildlife, its habitat and its management.

Statement of the Problem

Although the natural character of the river valley is the most valuable and dominant feature of the refuge, man is frequently more impressed with his own edifices. Therefore, it can be reasoned that the single most important structure of the refuge will be the Wildlife Interpretation and Education Center. It will be the first seen feature of the refuge, and, for many people, it will stand as the only symbol of the refuge and the Fish and Wildlife Service. It will be the main entry to the refuge and the focal point of many visitor activities.

The Center must create a most favorable first impression for the visitor. It must provide a subtle transition between the urban environment and wild character of the valley. It must show a hint of man's involvement, but must be dominated by the natural landscape. The hand of man should be seen, but the natural landscape as if it is a further expression of the valley bluff on which it is to be built.

The Center should be designed so that the visitor can experience and enjoy the valley's elements: land, sky and water. The clouds, sunrises and sunsets over the valley must be a part of the structure so as to enhance the visitor's understanding of total relationships.

The surrounding site, although already disturbed by man, should appear to be left untouched except for an access path to get from here to there. There should be openings for the sun, and meadows that are knee-deep in grasses and wildflowers - good places to observe the night sky, the woodland, and the prairie plants. Above all, the building and surrounding site must stand as a lesson in the harmony of man and nature.

The sense of the Minnesota River Valley must be captured. It is different from all other rivers and river valleys, and has its own story to tell. Interpretation should focus on the marshes and the land between the river and the bluffs.

The main purpose should be to interpret wildlife management. The primary role is one of education.

The Interpretation and Education Center

The Complex must have a specific relationship and sequence of components designed to maximize the visitor's appreciation and understanding of the program and exhibitions.

The sequences may be divided into two parts, the first being the primary interpretive spaces which are responsive to the main flow of visitors from arrival to departure, and the second is the ancillary spaces which incorporate all of those support facilities which are contributory, but not necessarily mandatory to the interpretive presentation.

1. The primary spaces include:
 - a. Recognition
 - b. Arrival
 - c. Transition
 - d. Reception/Information
 - e. Interpretation
2. The ancillary spaces include such facilities as:
 - a. Administration/Operations Spaces
 - b. Educational Spaces

Site Requirements

1. **Access** should be from the southwest corner of the site to minimize automobile impact on the Center. The access road and parking should be screened from the Center. Although there may be only one main entrance to the site, immediate public and staff access to the structure should be physically and visually separate. The access road, except for the main entrance portion, should be flow-through, one-way, to minimize road impact on the site and to accommodate vehicles towing trailers or boats and large recreational vehicles. Roads should be paved for maintenance and runoff control (erosion) reasons, and should be 16' wide for one-way circulation and 24' wide for two-way circulation.

2. **Site signage** will be needed at site entry and traffic guidance as required. There is to be one sign with a maximum area of 40 sf.

3. **Parking** should conform as much as possible to the existing land form and vegetative masses to minimize site disruption. Public and staff parking should be physically and visually separated. Public parking should be one-way, flow-through, and must provide for recreational vehicles and vehicles towing trailers and boats. Large, expansive parking lots should be avoided if possible, and vegetation should be used to divide parking areas into small units. Public parking should include 90% standard spaces and 10% double spaces.

To be as Follows:

Staff Parking	15
Handicapped Parking	3
Visitor Parking	152
	170 spaces

4. **The public walkway** between the public parking and the entrance associated with the lobby/reception area should be a transition from the parking to the structure, and should complement the building and set the stage for the interior experience. Consideration should be given to grade change elements, ramps, retaining walls, etc., and natural planting in this area to direct views and provide a stimulating entry experience. The connection between the parking and the structure will be accessible to the handicapped.

5. Building Location

Some flexibility exists in the exact location of the building. The general area is indicated on the topographical plan. No construction is permitted below the 800 contour. The owner specifically notes that the building should not violate the edge of the bluff. It can be set into the terrain that is north of the bluff. Berming is encouraged, particularly on the north side,

6. **An education area entrance** is to be provided, particularly for large groups using this area.

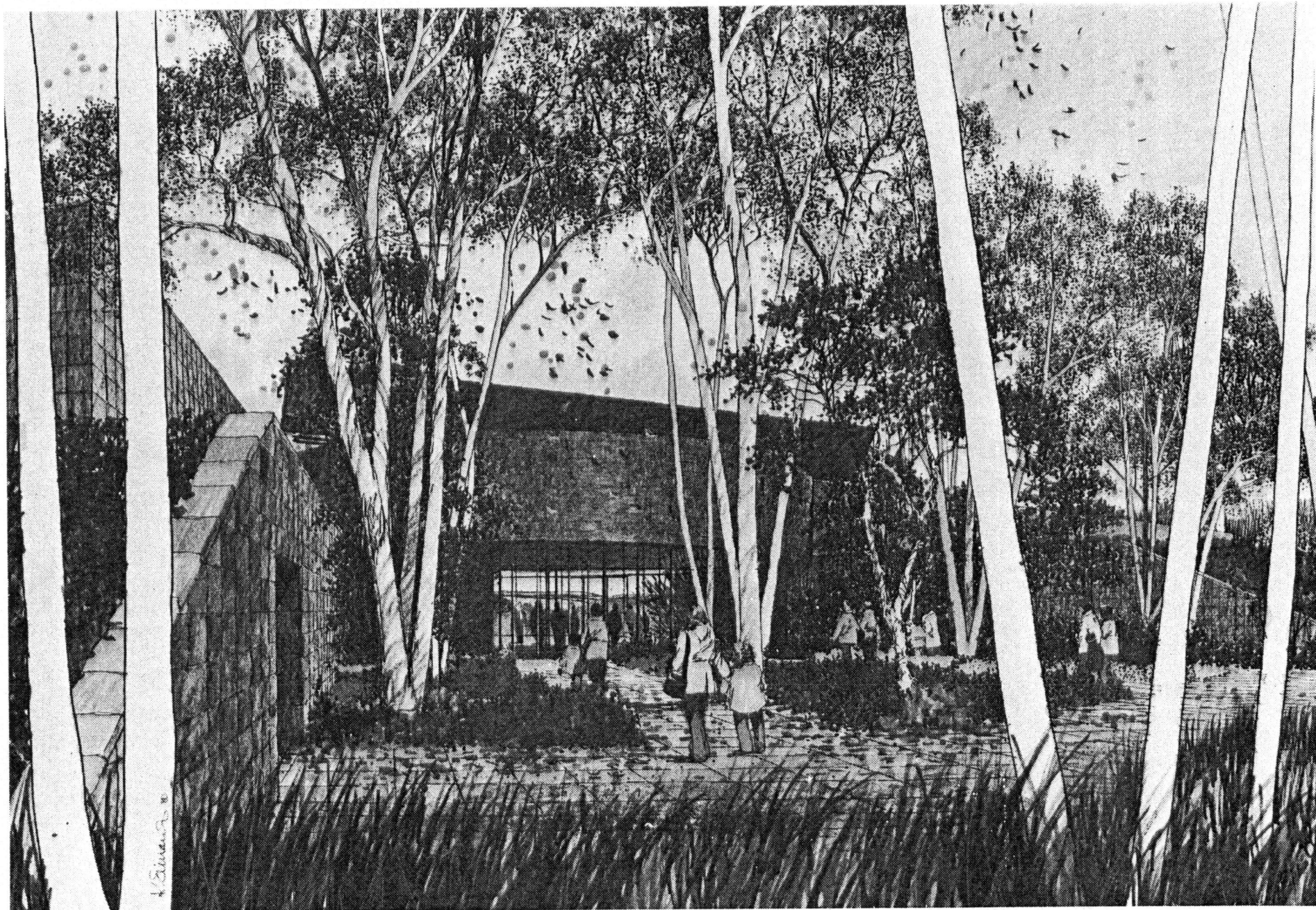
7. **The staff entrance** is to be separated from the public entrance, and should create a pleasant entry experience for the employees. It will be directly associated with the staff parking and the garage facility, if this is not an integral part of the main structure.

8. **A terrace or deck** should be directly associated with the structure. It could serve as a trail head, but should contain sitting areas, shade, wind protection and space for outdoor interpretive exhibits - tell something about the refuge. This space may be associated with the public entrance, but should be physically separated. Views from the terrace should be directed toward the valley. Informational devices on the terrace will direct the visitors to potential trails and interpretive potential along the trails.

9. **Trails**, beginning at the terrace, will sensitively explore the site, offer interpretive elements and provide views to the refuge. Maps or diagrams of the refuge will be provided to explain what is being viewed, and its relationship to the entire refuge. The trail to the first overlook should be accessible to the handicapped. This requires a paved trail at a five percent maximum grade. The remaining portion of the trail will be crushed rock, and can exceed five percent grade. Steps are discouraged.

10. **A refuge access road** will begin at the Center and lead to the Long Meadow Lake Wildlife Management Unit on the river flood plain. This should be accessible from the visitors' parking lot by autos and shuttle buses. The bus will require a loading area near the Center, connected by a short walking path.
11. **Other outdoor spaces**, such as rooftop terraces/balconies, are to serve as observation areas with views into the refuge. Designed properly, views to the highway can be screened, allowing for an undisturbed view of the meadow to the north. Provide a controlled yard (a casual backyard area) for exterior classes and activities. At the bottom of the bluff, provide an informal area for speaking to small groups of visitors.
12. **Landscaping** should represent refuge wild areas. Park-like planing and manicured lawns must be kept to a minimum. Indigenous plant materials will be utilized to reinforce the natural environment. Natural vegetation growth will be restored and reinforced to maintain a natural environment. The impact of paved roads and parking surfaces is to be minimal.
13. **Clearing and removal** of trees and undergrowth shall be done very discriminantly and shall be limited to the immediate areas required to construct roadways, paths and buildings, and to proved vistas.
14. **An observation tower** is permissible. Airport regulations have a 150' height restriction.
15. **A maintenance garage** serving the Visitor Center only is to be located on site in a separate structure. The garage is to house a truck-mounted snowplow, lawnmowers, a boat and trailer, two canoes, a jeep and a van-sized shuttle bus.

Part III: The Schematic Design
Perspective Sketch - Entry Court



Design Concept Statements

Architectural Design Concept

The activities on the site are organized to establish an approach sequence which controls the visitor's perception of the Wildlife Refuge. The gateway at the access drive indicates arrival to the site. Connecting the parking areas to the Interpretive Center is a wooded path which provides a transition between the suburban vehicular context and the Interpretive Center, which is the beginning of the visitors' River Valley experience. The building is set into the hillside at the top of the natural bluff. Large berms protect the northern edge of the structure and also lessen the visual impact of the building on the environment. The east-west building axis is established primarily to maximize southern exposure for the solar energy systems, but also provides excellent view potential.

The activities in the building are organized off the reception/entry space, which is the focus of the entire complex. A circulation spine generates from this space, connecting the three major functional elements: 1) Interpretive exhibits, 2) education, and 3) office. Each activity may be used separately in conjunction with the reception/entry space, which allows the other areas to remain secure when not in use. The main function elements are individually expressed, with the hard forms on the north side of the circulation/energy spine. The exhibit space is expressed in an organic form, river side of the spine, representing its natural character.

Energy Design Concept

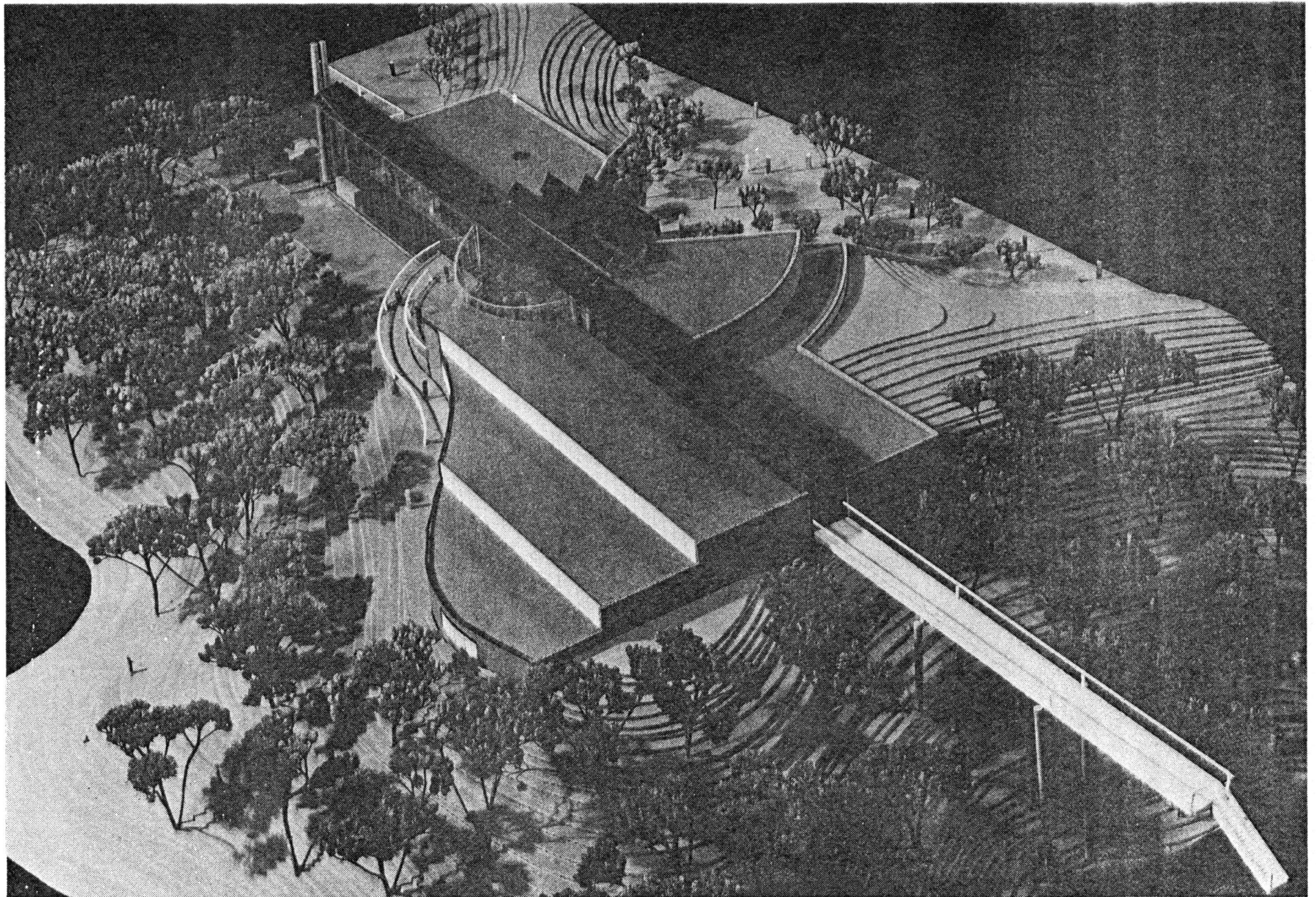
One of the primary goals in the design of the Minnesota Valley Wildlife Interpretive Center was to achieve an energy efficient building by integrating the architectural and engineering functions.

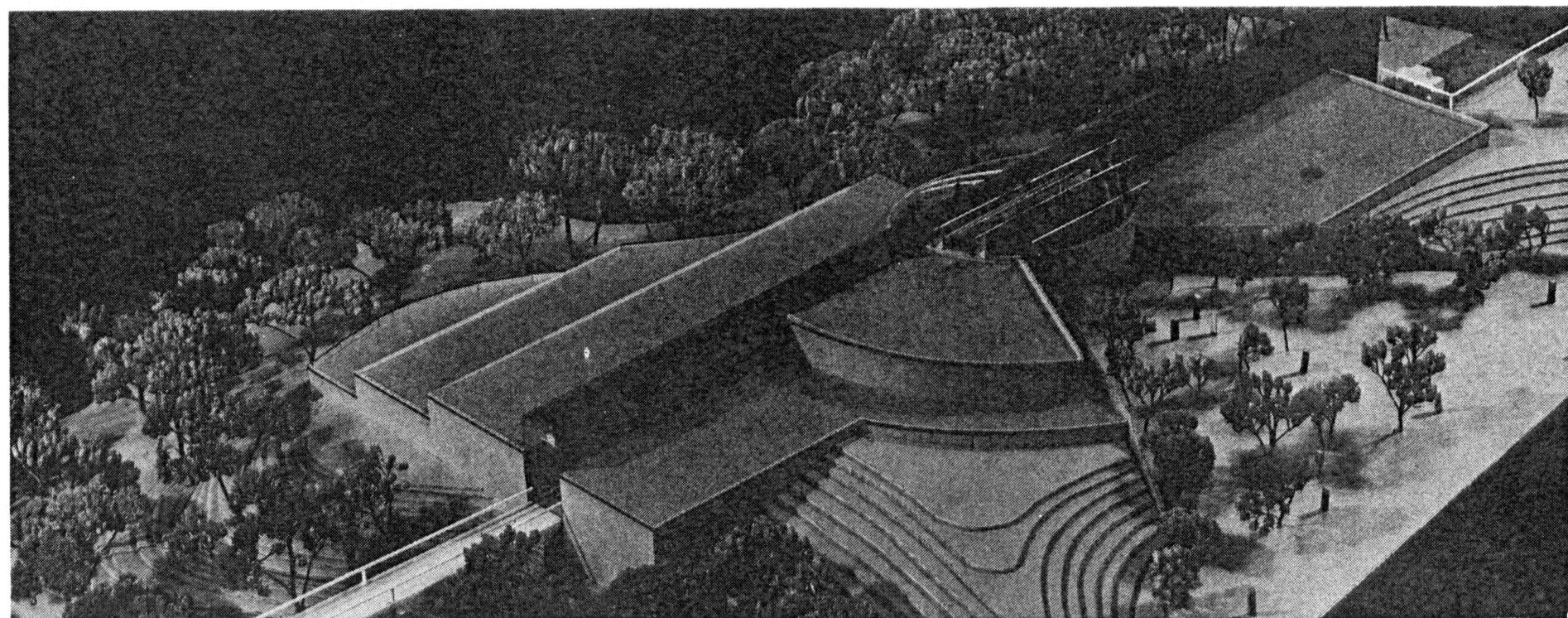
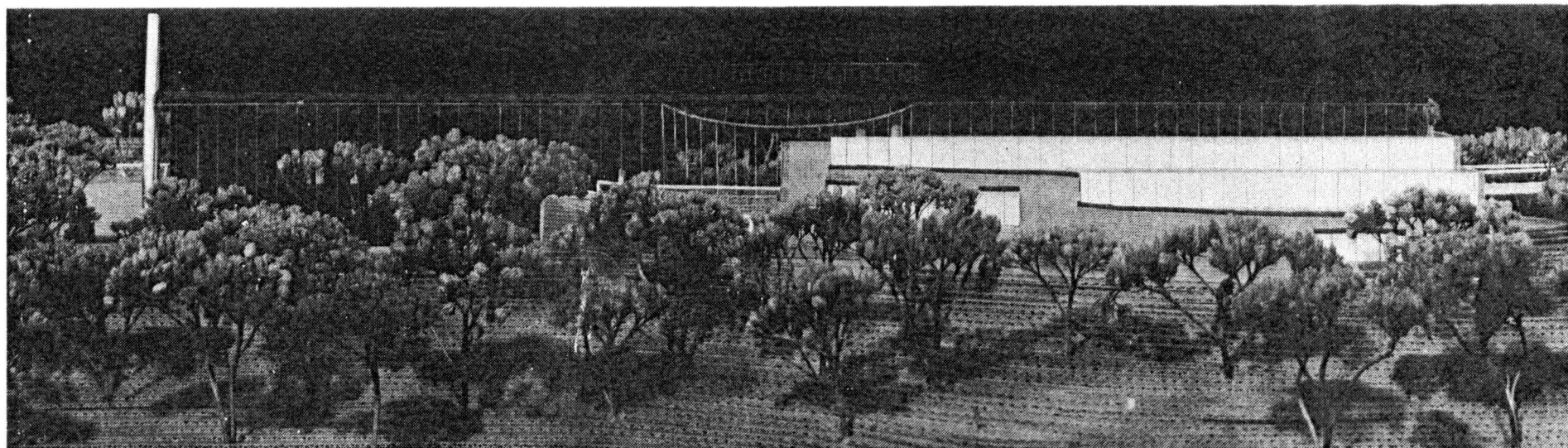
The building is divided into three main functional areas which define three "thermal zones." The zones provide heating, cooling and ventilation from a centralized mechanical space and an "energy spine." The separate thermal zones provide a means to isolate and shut down any of the building functions when they are not in use, saving on lighting, heating and cooling energy.

The energy spine contains the active and passive solar energy systems and also serves as a distribution element for mechanical and electrical systems. The optional solar system has 5200 square feet of solar collectors and can provide approximately 50% of the space, ventilation and domestic water heating for the building.

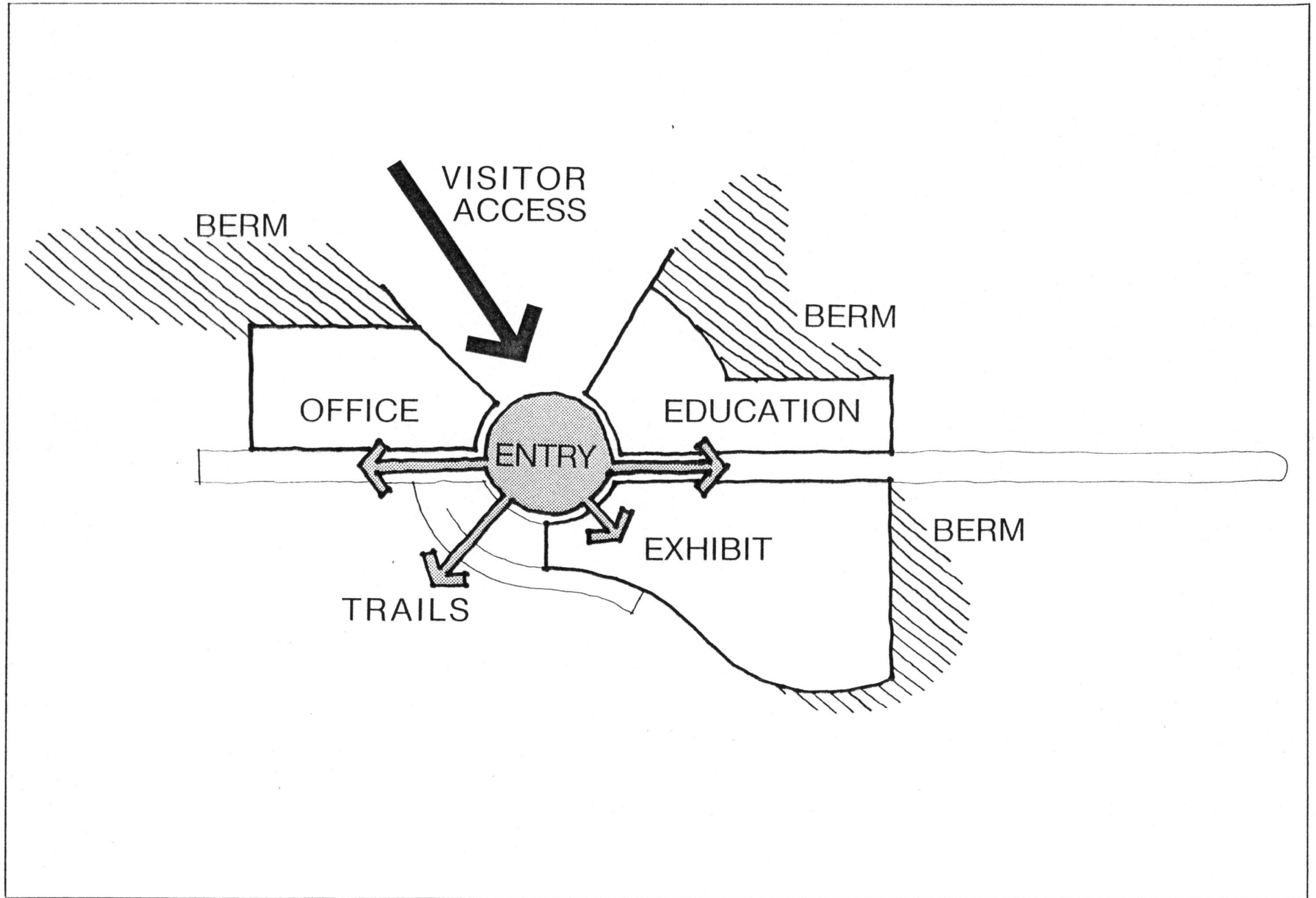
The hybrid passive system is an attached greenhouse that is to pre-heat return air from the office and receiving areas during the heating season. In the summer months the greenhouse is naturally ventilated by an operable louver located at the top of the energy spine.

The north of the building is located below grade to minimize winter heat loss and to protect the building from winter winds.

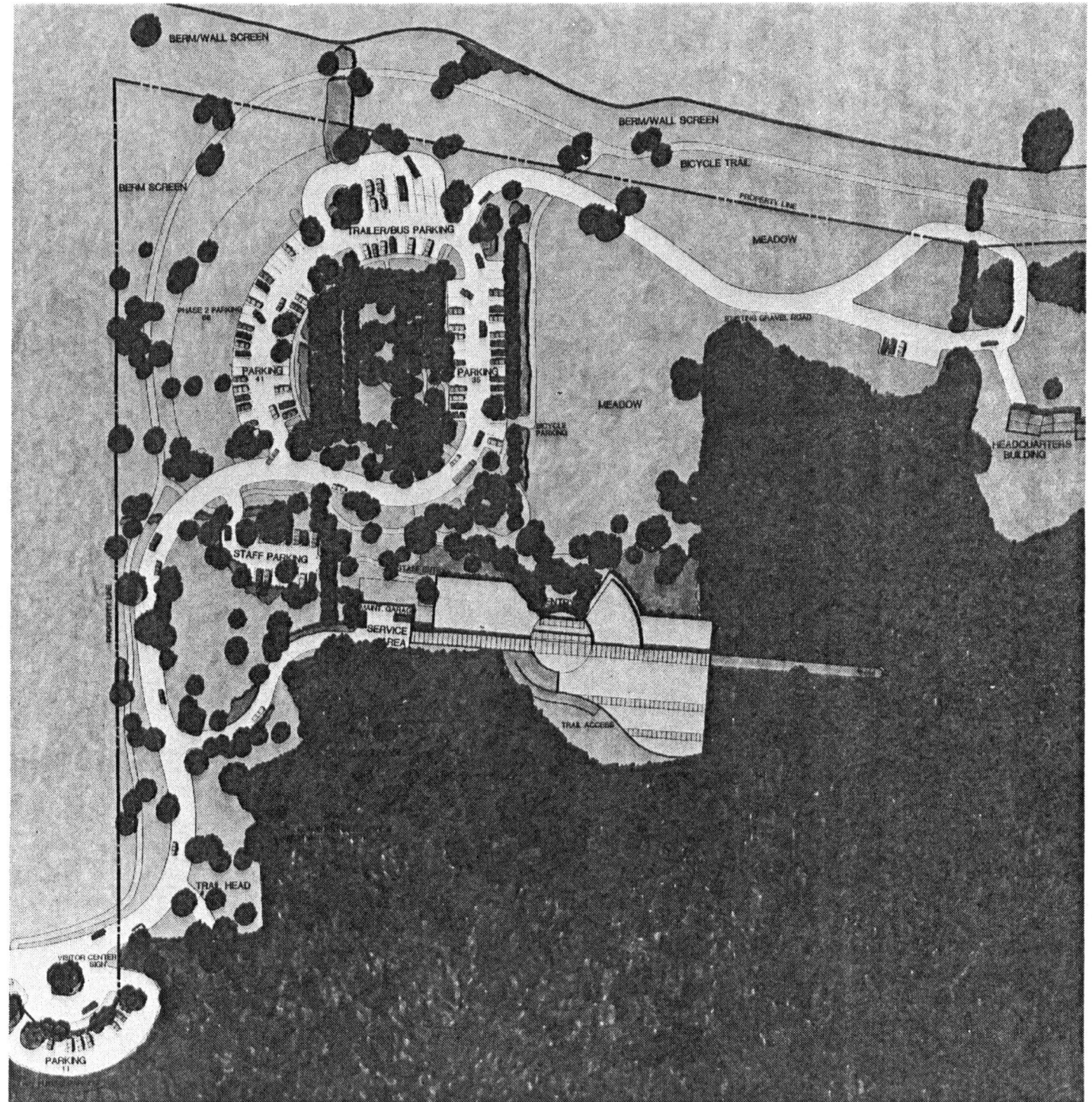




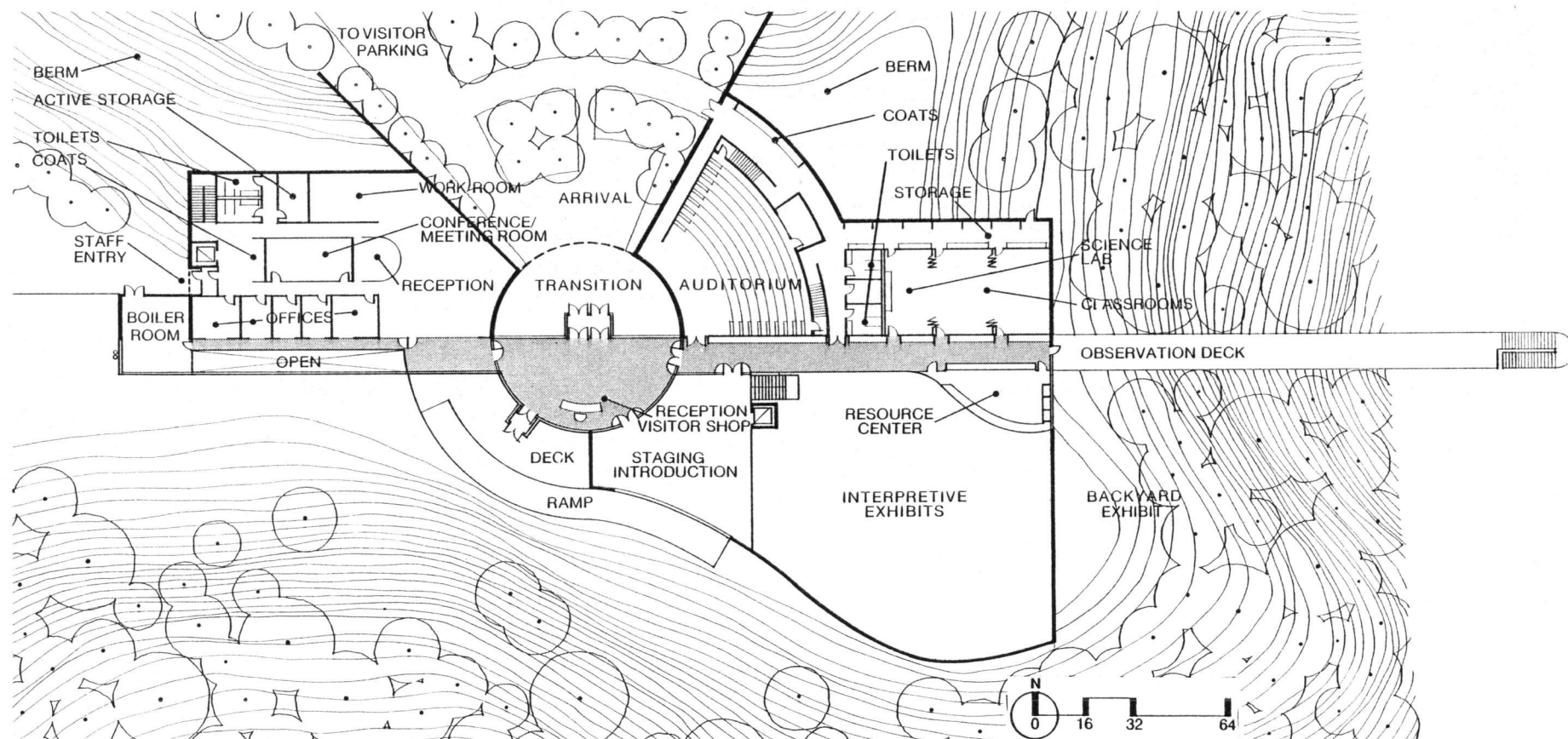
Architectural Diagram



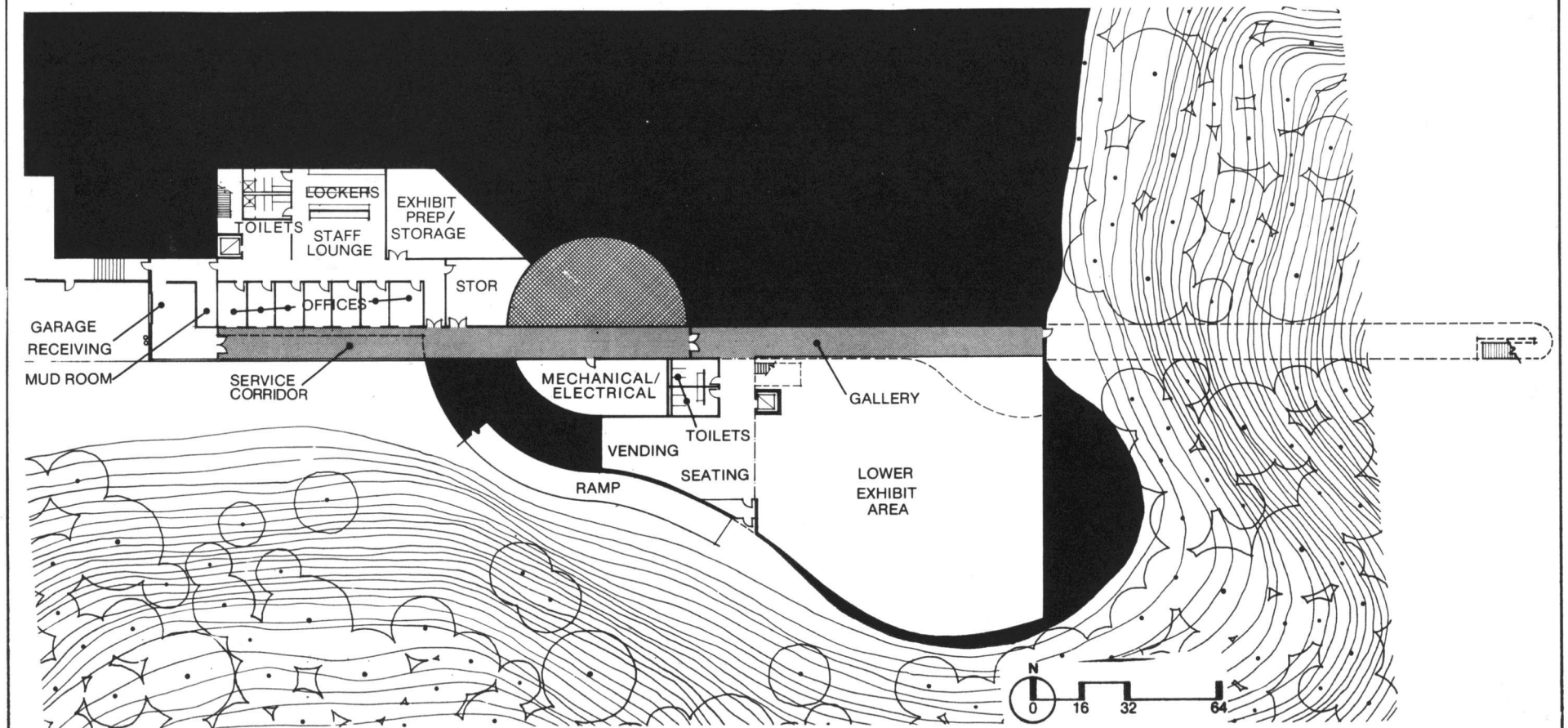
Site Diagram



Entry Level Plan

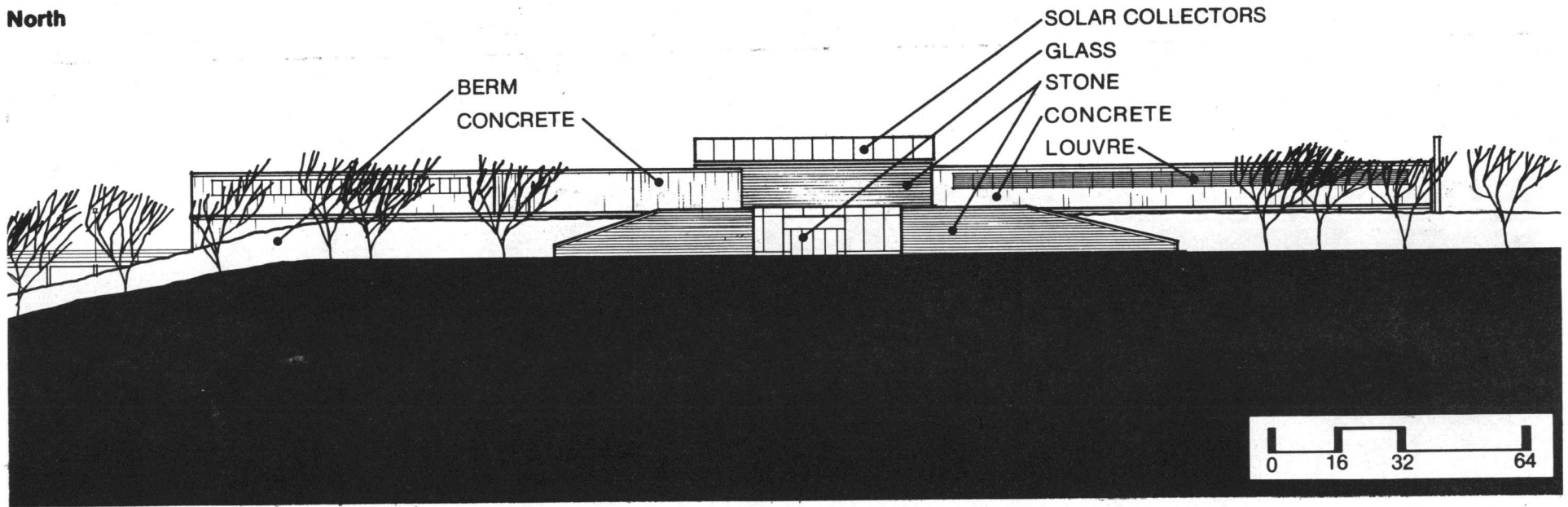


Lower Level Plan

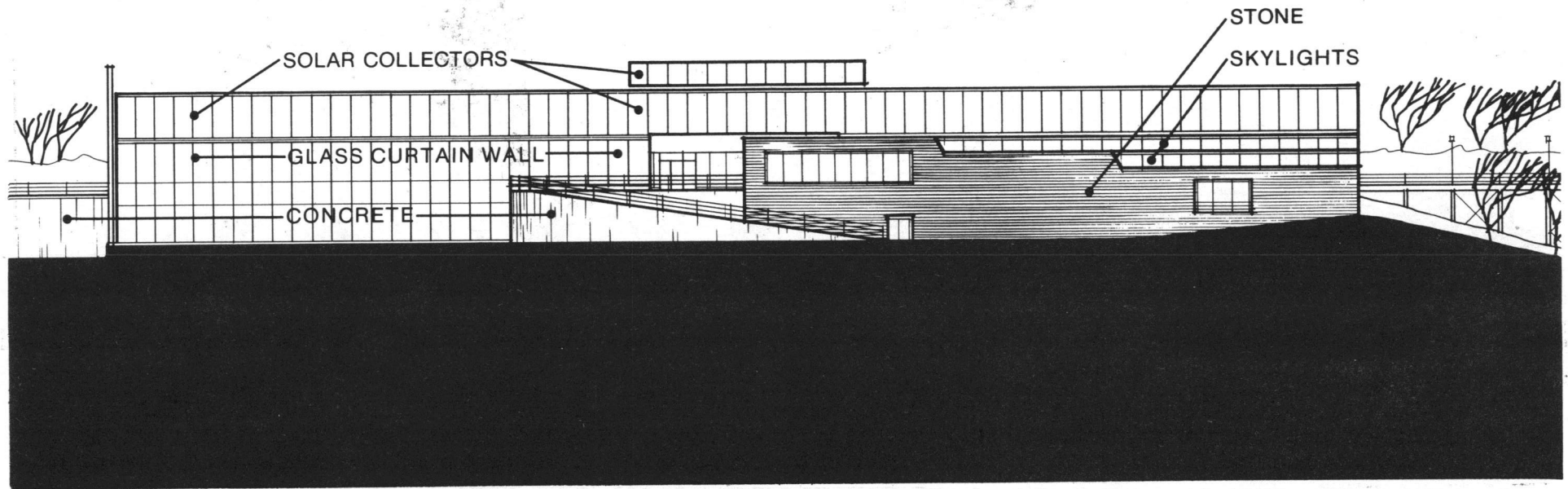


Elevations

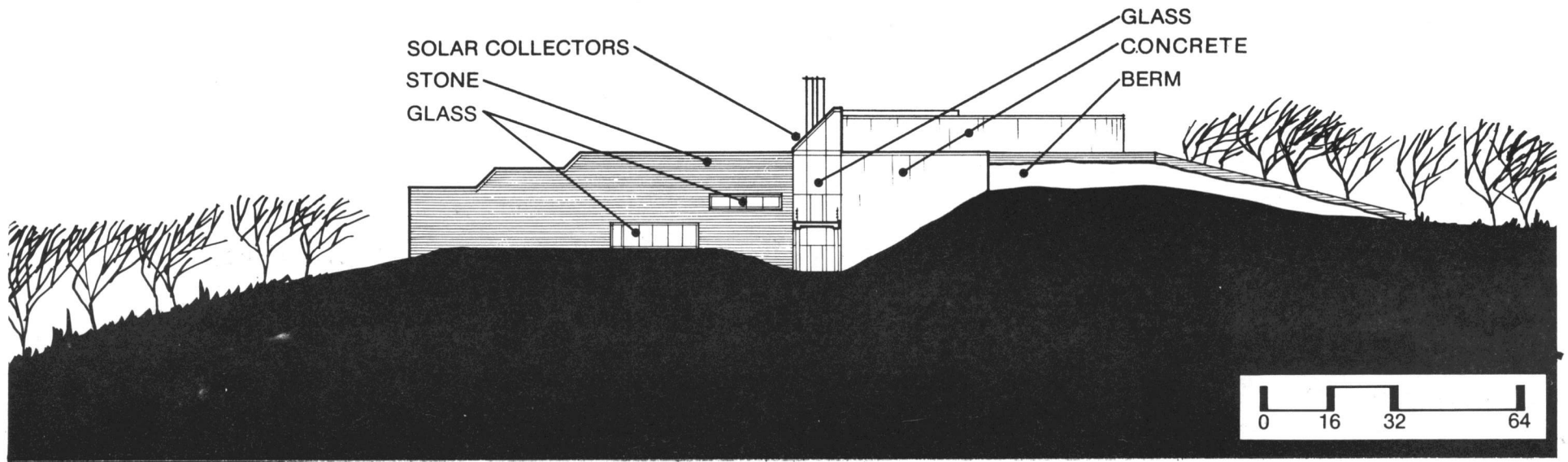
North



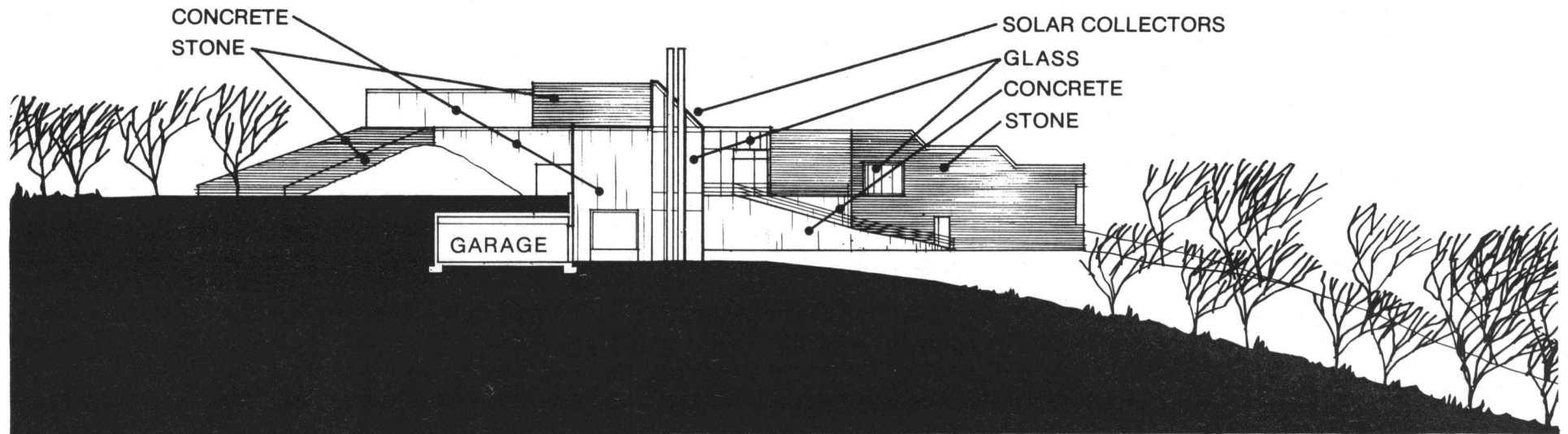
South



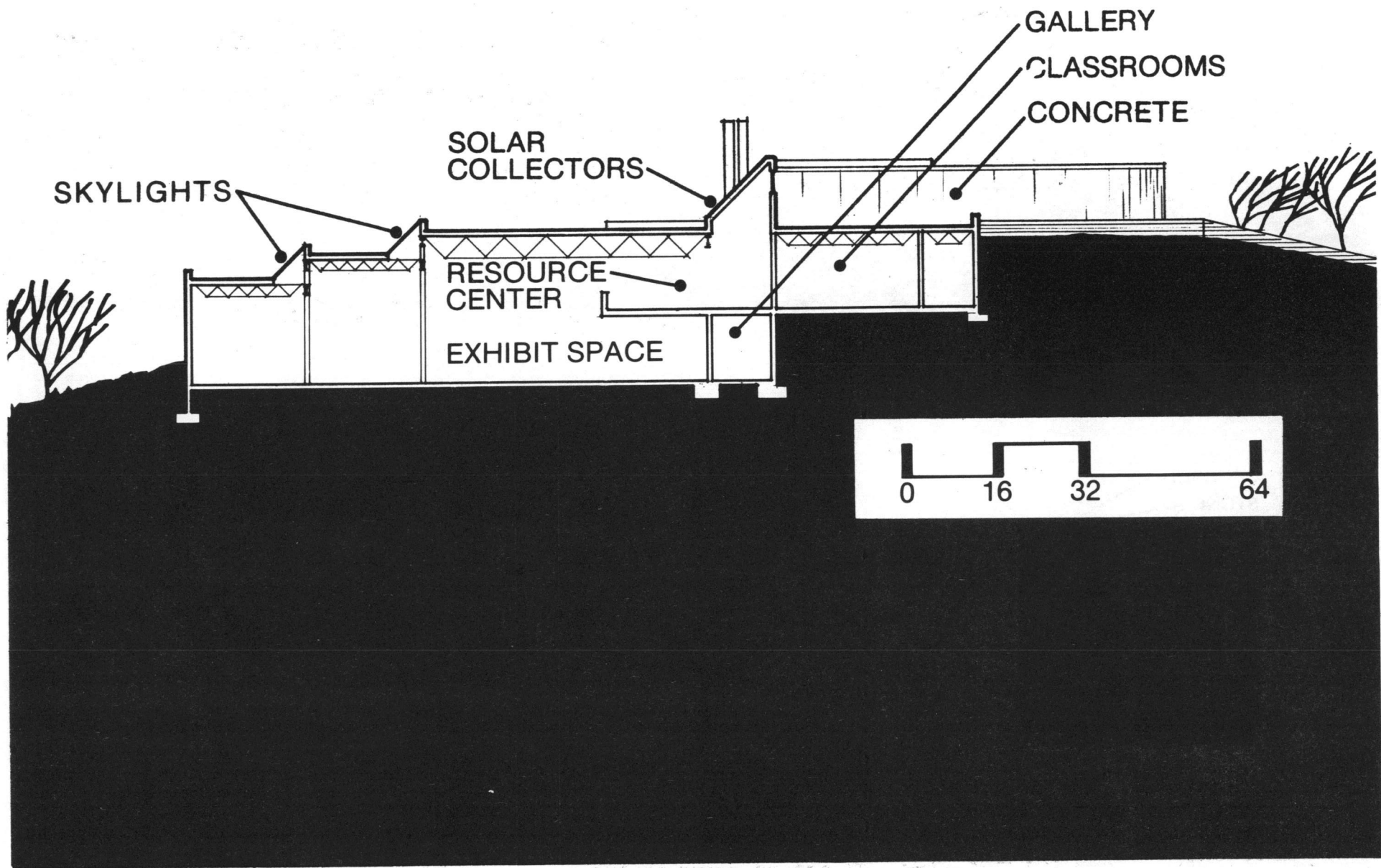
East



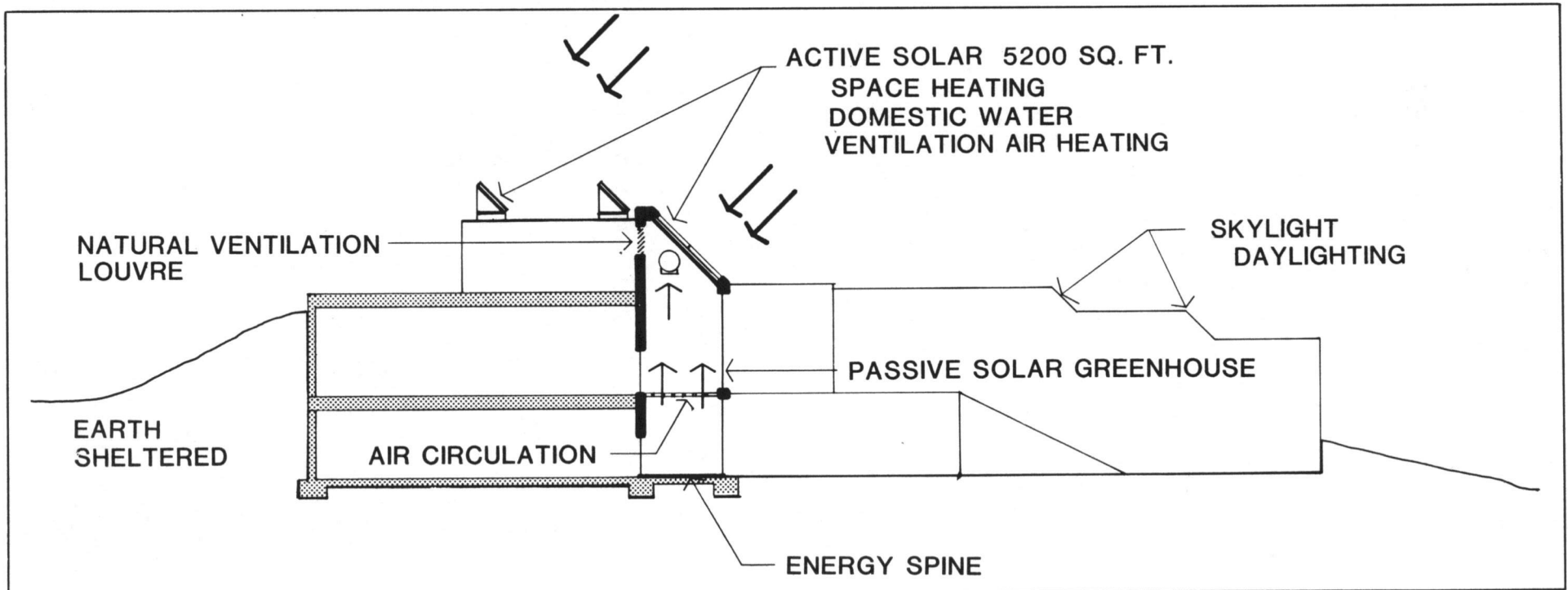
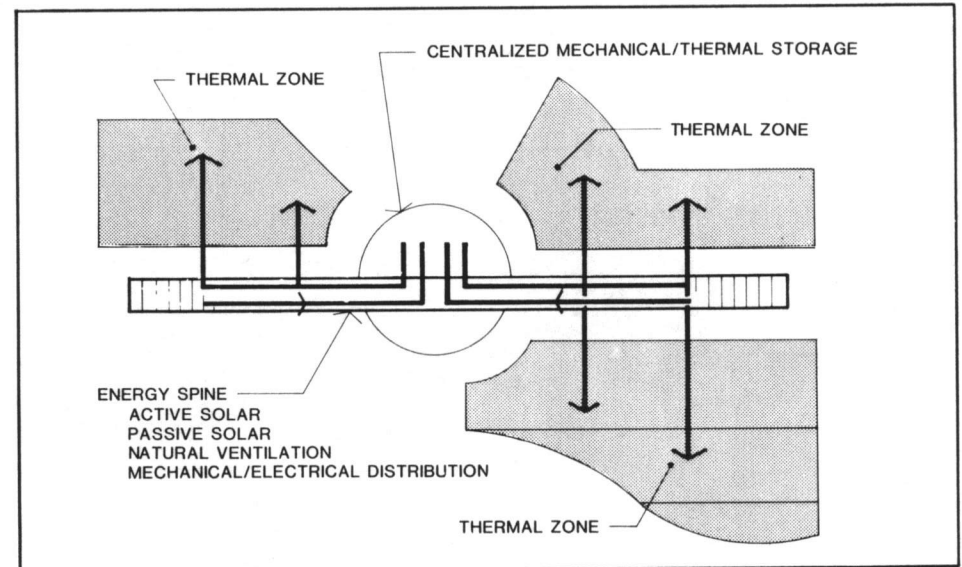
West



Building Section - Architectural



Mechanical Diagram Building Section - Mechanical



The Space Program/Exhibit Requirements

Program Components:

- 1) **OVERVIEW** (general)
- 2) **ORIENTATION** (to inquiry approach, to exhibition and to refuge)
- 3) **ECO/DIORAMA**
- 4) **THEME SECTIONS**

BLUFF: Upland habitats and streams;
species and management techniques

BOTTOMLAND: Succession and stratifications;
species and management techniques

WETLAND: Marshes and food chains;
species and management techniques

VALLEY IMPACTS: Floodplains, man's impact
(positive and negative) and species affected

5) **GALLERY/SEATING AREA**

- 6) **EXTERIOR DISPLAYS:** 3 outdoor spaces to be viewed from the interior adjacent to the appropriate theme sections, illustrating management techniques for
 - a. Apartment balcony
 - b. Suburban backyard
 - c. The Refuge itself

Exhibit Requirements (continued)

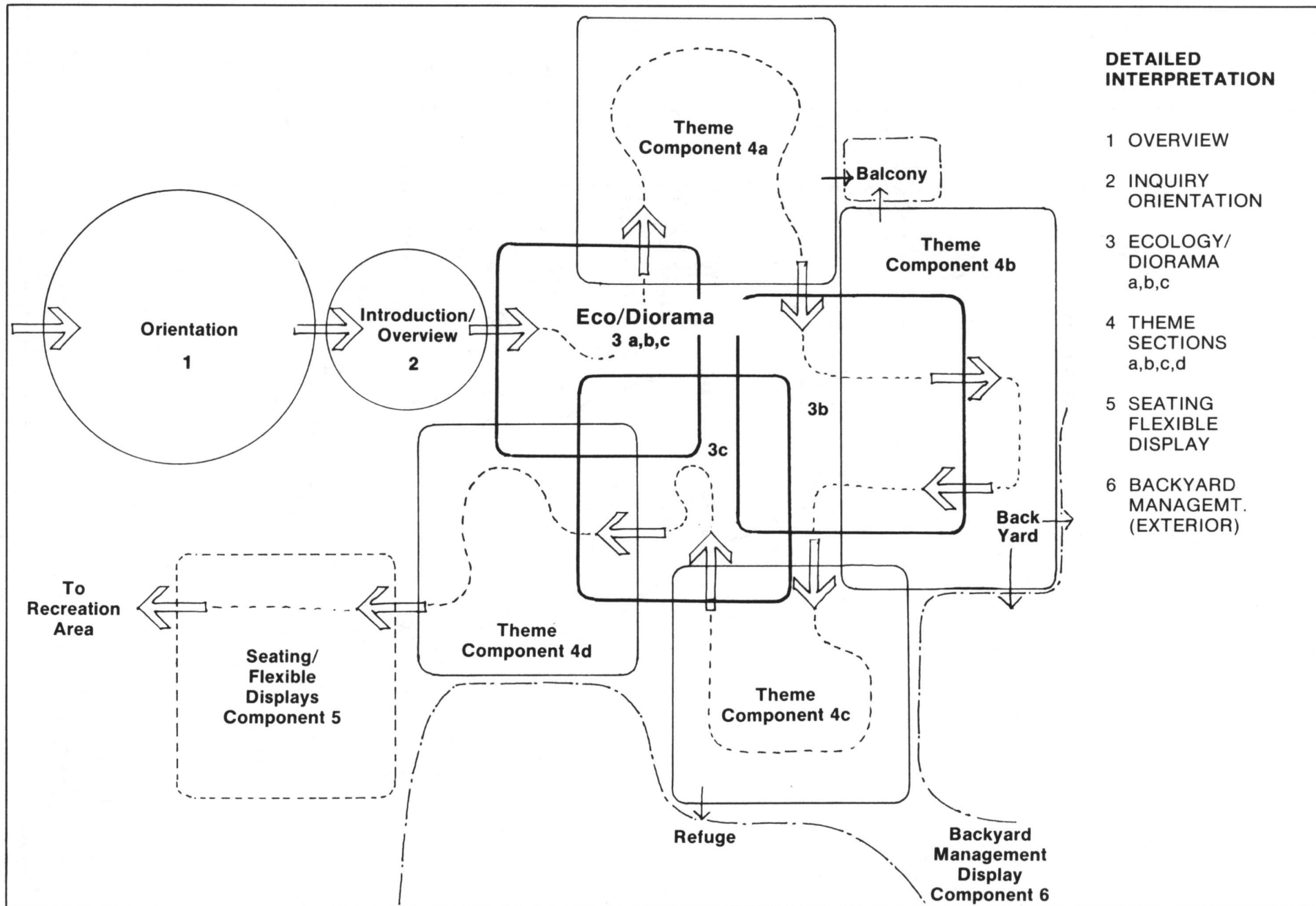
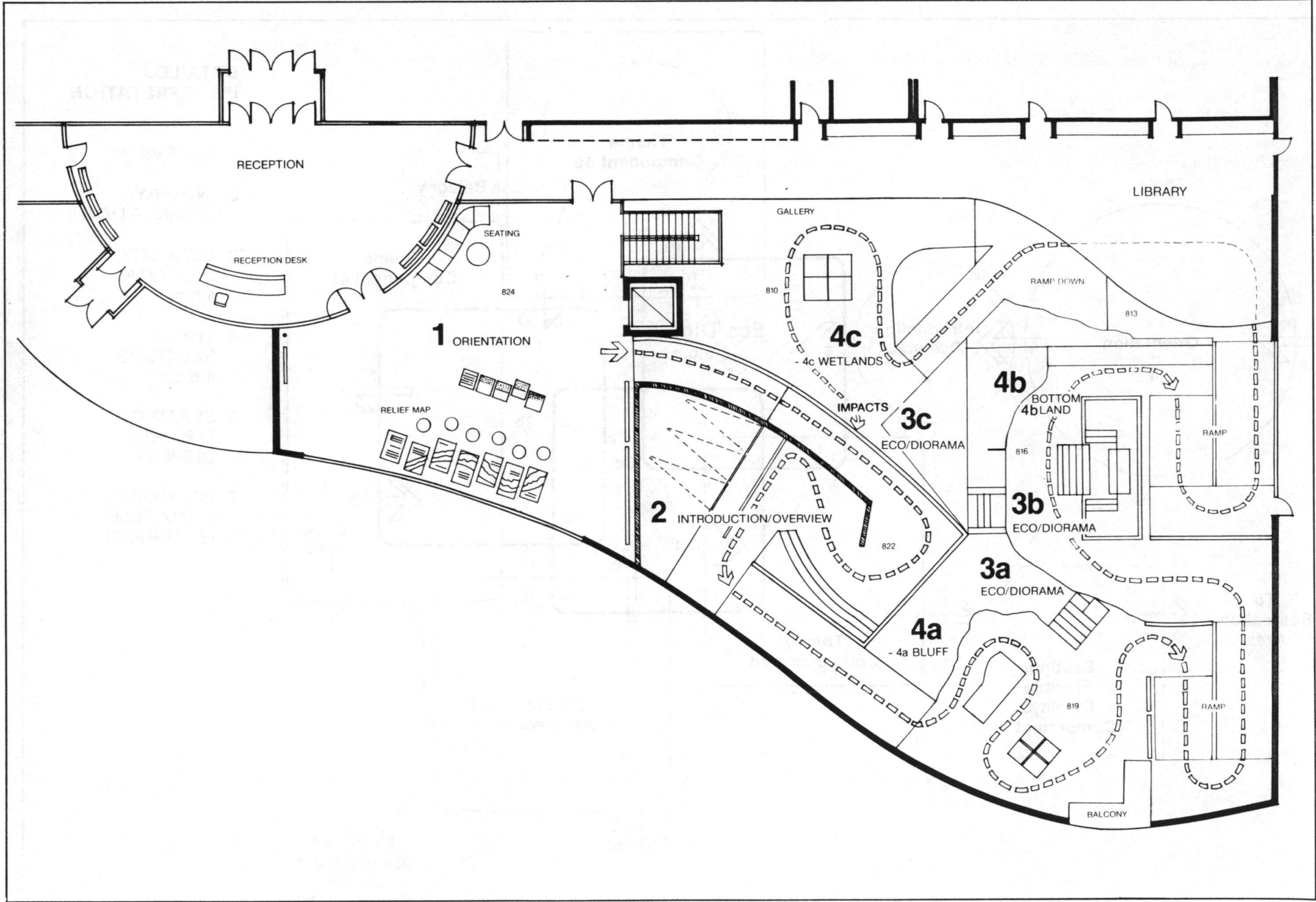
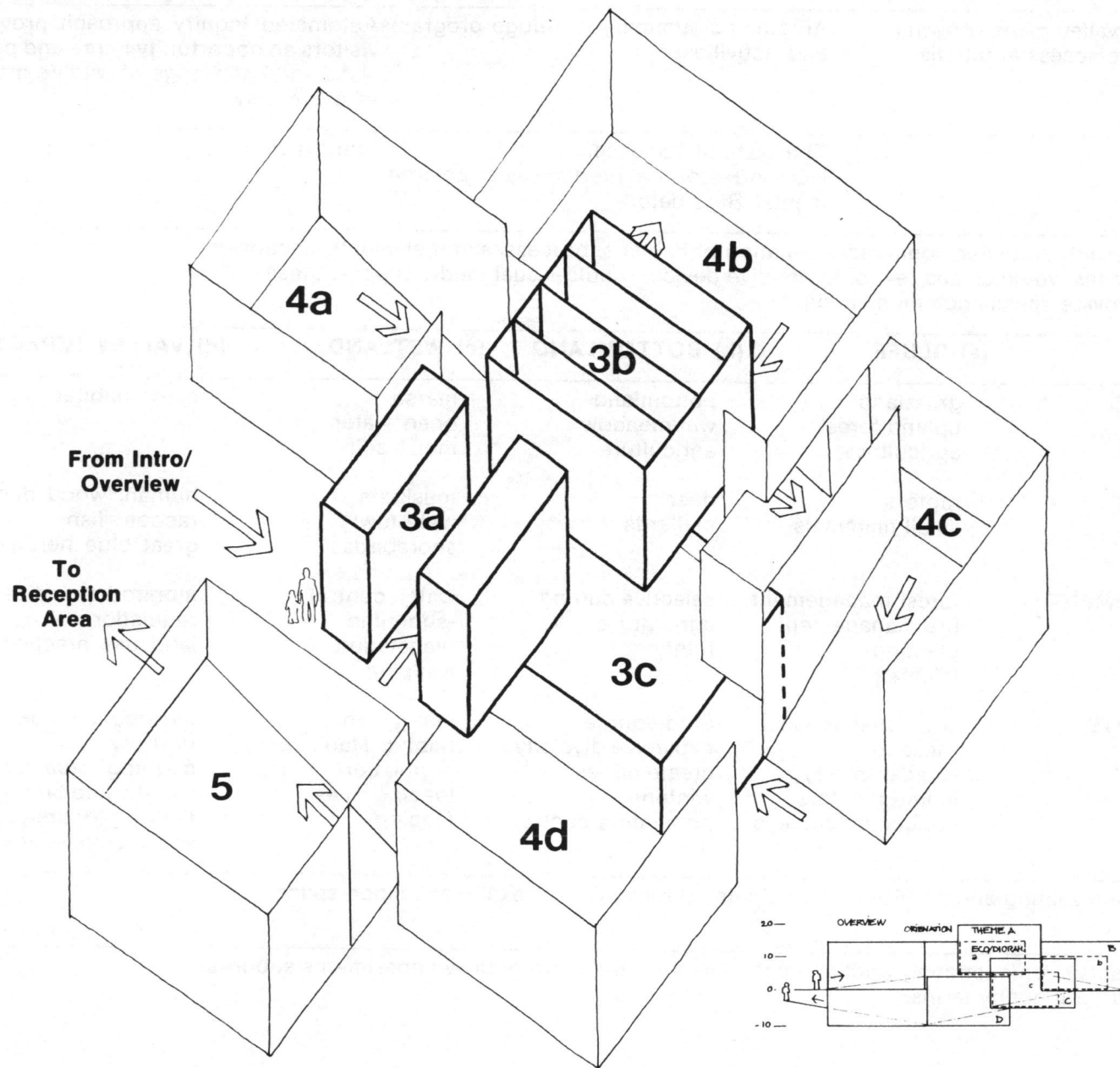


Exhibit Plan - Entry Level



1 ORIENTATION:	Orientation to valley maps showing facilities, public access and trails.	Automated summary of refuge programs and activities.	Automated Inquiry approach providing visitors an opportunity to pre and post test his skills and knowledge of wildlife management in a fun way.		
2 OVERVIEW:	The History	The Natural Landscape Human/Resource Interface as a "Environmental Barometer"	The Wildlife		
3 ECO/DIORAMA:	Visualisation and three-dimensional representation of habitats, processes and elements; sectioned into several planes, volumes and levels. Interactive devices, audio-visual media support these concepts to provide special communication.				
4 THEME AREAS:		(a) BLUFF	(b) BOTTOMLAND	(c) WETLAND	(d) VALLEY IMPACTS
	HABITAT	grassland upland forest agriculture	bottomland wet meadow agriculture	marsh open water moist soil	mans habitat
	SPECIES	raptors small mammals	deer mallards	muskrats waterfowl shorebirds	human, wood duck raccoon, fish great blue heron
	MANAGEMENT	forest management fire management planting telemetry	selective cutting agriculture hunting	water control -shoreline -vegetation trapping	monitoring indicators regulation land use practices
	CONCEPTS	cover maintenance -nesting -predator/prey limiting factors population surveys	food source maximize diversity create edges wintering population control	energy flow habitat stabilisation population control loading sites feeding	bioaccumulation territory carrying capacity shared habitat flooding/drainage-upstream soil erosion-upstream
5 GALLERY/ SEATING	Open space with seating and provisions for wildlife art display and flexible exhibition space.				
6 EXTERIOR DISPLAYS	An exterior display demonstrating wildlife management on the scale of urban apartments suburban backyards and rural hobby farms.				

Exhibit Requirements (continued)



EXHIBITION SEQUENCE:

- 3 ECO/DIORAMA
 - a) weather/poll.
 - b) vegetation
 - c) water/soils
- 4 THEME AREAS
 - a) bluffs
 - b) bottomland
 - c) wetland
 - d) floodplain
- 5 SEATING
 - flexible displays

☒ ECO/DIORAMA
☐ THEME AREAS

Exhibit Design

Overview

The major visual concept will focus on large interactive and information components which are three-dimensional. All attention will be focused towards a central visual space, the walls subdued and passive. Color schemes will be natural with different light intensities used for emphasis.

As visitors enter the exhibition area at the upper level, they will see all the levels and get a sense of the interconnectiveness and scope of the whole.

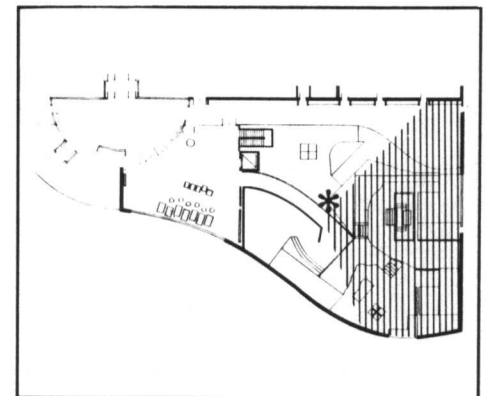
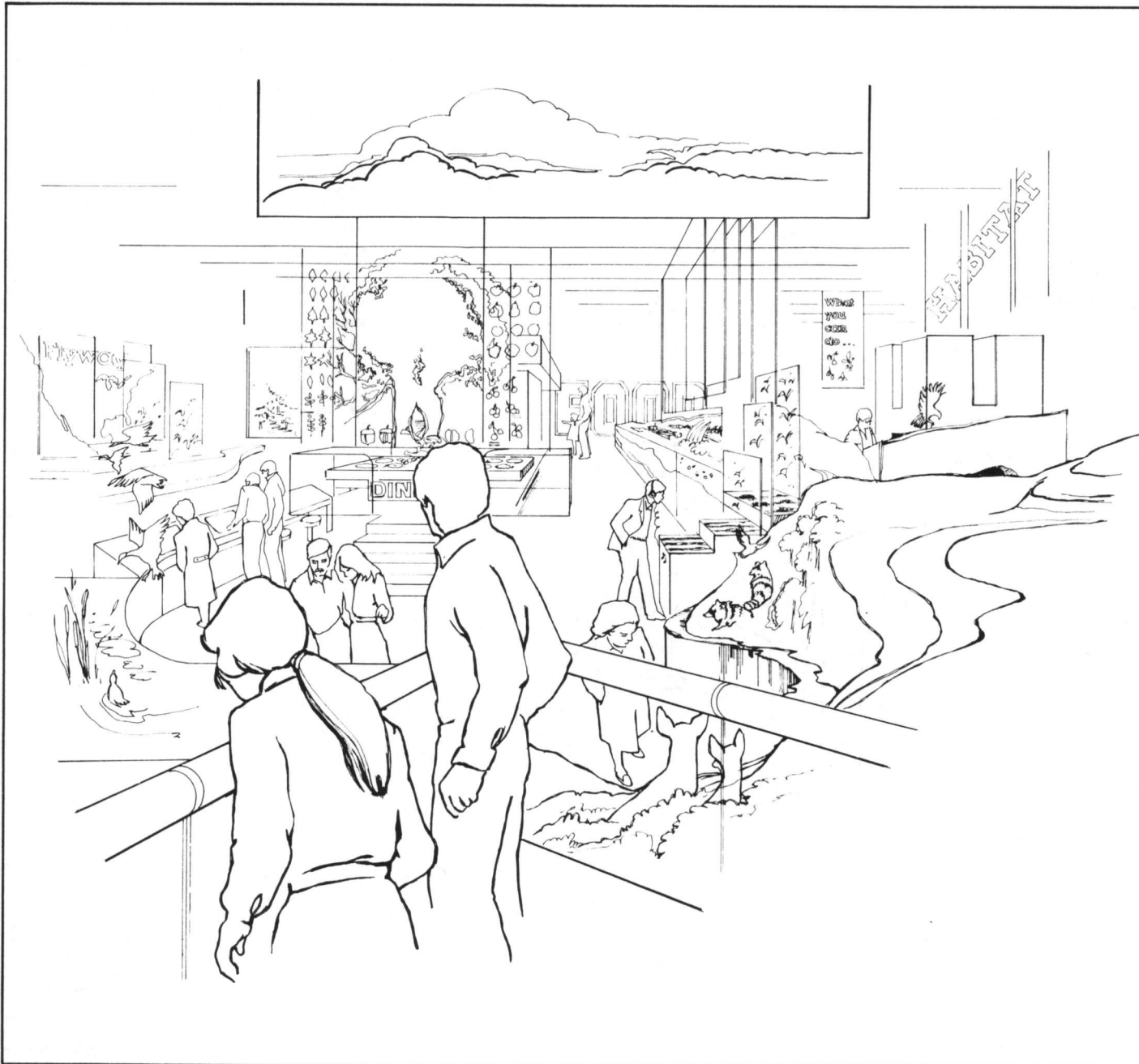


Exhibit Design



Introduction: Overview

Entering the orientation area, visitors will confront a type of vending machine in which they will choose a "test case animal." The card will enable the visitor to play several game-like exhibits and see their animal's particular essentials for life.

Beginning here and used throughout the exhibit, the inquiry approach will enable visitors to learn at their own pace with the use of an animal card as a personalized element.

Before leaving the area an Audio Visual Panorama will show how nature and man effect the refuge's wildlife, and how monitoring wildlife gives an environmental barometer of our quality of life.

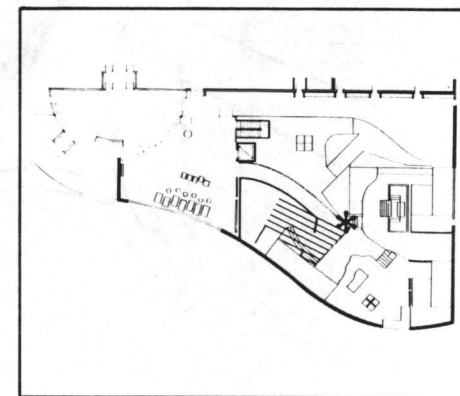


Exhibit Requirements (continued)

Requirements Component 1 Orientation

This sequence tells how to use the refuge; its facilities and programs. It also introduces the inquiry approach and specific wildlife management techniques--utilizing maps, video and computer games.

Architectural Requirements:

Size: approximately 800 sq. ft.

level change: not required

Lighting: Artificial and daylight
(exterior exposure)

Relationship: next to or part of
component 1, OVERVIEW

Storyline: Orientation,

Animated wall map and interactive discovery game utilizing the refuge's computerized resource data base . . . Here visitors can get answers to some basic questions about where to find wildlife and what to do at the refuge. The program teaches something about basic inventory techniques and relationships between living and non-living things. By looking in the right places, we stand a better chance of seeing our favorite kinds of wildlife. Access and observation points can be located on the map, along with other recreational opportunities. The program may be tied into a video disc or tape player and video projector or monitor so that visitors may see and hear selected phenomena described in the program and located on the map. They may also want to see what's current in terms of management programs, recreation activities and phenology.

Exhibit Requirements (continued)

Requirements: Component 2 Introduction/Overview

This section of the Interpretive Center provides an overview of the Minnesota Valley by means of an audio-visual presentation, which surrounds the viewer as he meanders through a space, and ramps up one half level.

Architectural Requirements:

Size: approximately 1200 sq. ft.
Level change: yes, ½ level
Lighting: dark box, artificial light

Storyline: Introduction, (Wildlife barometer)

Storyline: Introduction (Wildlife Barometer)

A great flood carved the Minnesota Valley 10,000 years ago when the Continent escaped the grip of the Ice Age. This immense force is replicated almost annually on a lesser scale. The Valley became a haven for a multitude of wildlife from prairie, woodland and wetland. There were spectacular seasonal migrations along the natural corridor and from the open uplands to the sheltered bottomlands for winter cover.

People were naturally drawn to this life-rich landscape. For thousands of years, different groups of Indians camped and hunted here. They learned to harvest wildlife on a sustained yield basis, switching foods during times of scarcity, moving with their prey, and manipulating habitats through fires and farming. Competing for available resources, settlers displaced the Indians, and in turn, agriculture is presently giving way to urbanization and commercialization.

Recognizing the threat to wildlife represented by gradual elimination and contamination of habitats in the lower Minnesota Valley, a citizen's group succeeded in getting legislation passed in the Nation's bicentennial year to create a wildlife refuge and urban wildlife recreation area. Now we are re-learning the lessons of the past—watching wildlife for signs of danger in the environment. Because the Valley acts like a funnel, not only for wildlife, but for upstream abuses as well, we can monitor the health of our surroundings while we take steps to improve them. As in the past, our survival depends on our ability to learn from nature and to adapt.

Exhibit Requirements (continued)

Requirements:

Component 3:

Valley Ecosystem (Diorama)

Requiring emphasis in terms of lighting and space the 3rd component is a multi-level, 3-dimensional diorama.

Encompassing a series of planes, both horizontal and vertical, the viewer will be able to walk around, over and through it, while viewing the theme sections and adjacent interactive exhibits.

Architectural Requirements:

Size: 2400 sq. ft.

Levels: Several

Lighting: Top level; daylight, lower level, artificial

Storyline: Ecosystem (Diorama)

The central component of the exhibit will be a sectioned, cubic, multi-level representation of the Minnesota Valley that will allow visitors to walk over-around-under-and-through to discover some fascinating elements and processes at work. Multiple planes within semi-transparent sections will be illuminated from various angles to illustrate species in their habitats, adverse human impacts and management activities. Interactive devices and audiovisual media may be used to enhance effects and to stress important concepts. As visitors descent the ramped corridor weaving through the diorama, they will have opportunities to enter four separate exhibit spaces adjacent to appropriate locations in the diorama.

Exhibit Design

Theme Area: Bluff

Visitors will walk down past the bluff they have seen from above. They will be able to touch items along the sides dealing with geology and Indian artifacts. At the first level, as they walk through a cutaway of the bluff, the theme of "homes/habitat" will be demonstrated by showing the management techniques of cutting and burning to stimulate new growth and provide habitats for prairie birds and animals.

Theme Area: Bluff

The visitor will experience the results of habitat protection and restoration through wildlife management and conservation-oriented farming practices.

The exhibit also shows the effects of rain, erosion and the use of fertilizers and pesticides on aquatic environments.

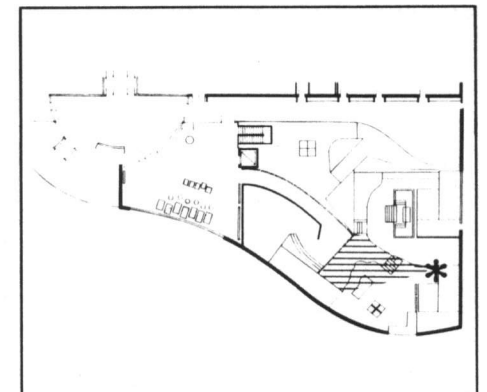


Exhibit Requirements (continued)

Requirements: Component 4a: Bluff

The first major exhibit space adjacent to the ecosystem diorama deals with upland and bluff habitats, featuring the wood duck with corresponding wildlife. The interpretive exhibits illustrating the specific management techniques used to maintain habitats in this area should be seen in a close relationship to the large diorama next to it.

At 2 points the visitor must be able to see the exterior exhibits; an apartment balcony and suburban backyard.

Architectural Requirements:

Size: 600-800 sq. ft.

Levels: Ramp or stairs down ½ level

Lighting: daylight

Relationship: Adjacent to Eco/Diorama

Storyline: Bluff

Beginning near the top of the diorama, visitors may branch into a portion of the exhibit focusing on the management of upland habitats and benefits to important or highly visible species.

Originally, the Minnesota Valley's stream-dissected bluffs were primarily cloaked with native grasses on the tops and mixed hardwood forest on the slopes. Periodic fires and grazing by buffalo and elk kept upland forests in check, while forests stabilized steep slopes, protecting native trout in the streams from sedimentation. Today, invading brush is set back by controlled burning to benefit a variety of prairie plants and animals. The upland sandpiper is one species that is returning thanks to grassland management. Another is the harvest mouse, which along with other prairie rodents, provides an abundant food supply for meat eaters from red-tailed hawks to red foxes. Predators help control prey populations which could otherwise destroy habitat and starve.

In the forest, habitat is a different kind of home. Cavities in old trees provide shelters for a tremendous variety of life from woodboring insects and woodpeckers to wood ducks. When people removed river valley forests in much of the country, they eliminated nesting places for wood ducks and the species almost disappeared. Recognizing the problem, people protected the remaining birds, erected nesting boxes, and began restoring habitat. Today, many metro area homes have wood ducks nesting in their yards. Streams, which once flowed clean from the bluffs into ponds where ducks were raised, may no longer support trout due to contamination from storm sewer outfalls. Rerouting storm sewers into collecting ponds can help settle out sediments and prevent contamination of springs and streams. The special insect life that supports trout can thus be restored to improve the health of both the aquatic and the surrounding terrestrial environment.

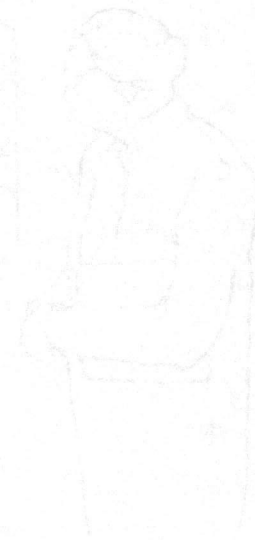


Exhibit Design

Theme Area: Bottomland

The bottomland story emphasizes "food sources and interdependence." Maximum diversity is shown to favor a greater variety of species. Audio devices are used here to illustrate the benefits of planting edges as food sources for song birds. Hunting is shown as a way to maintain the balance between the deer population and its food supply.

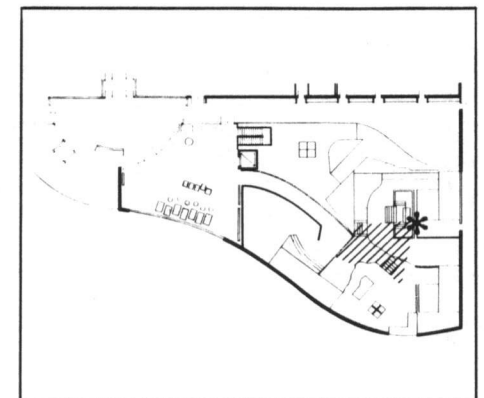
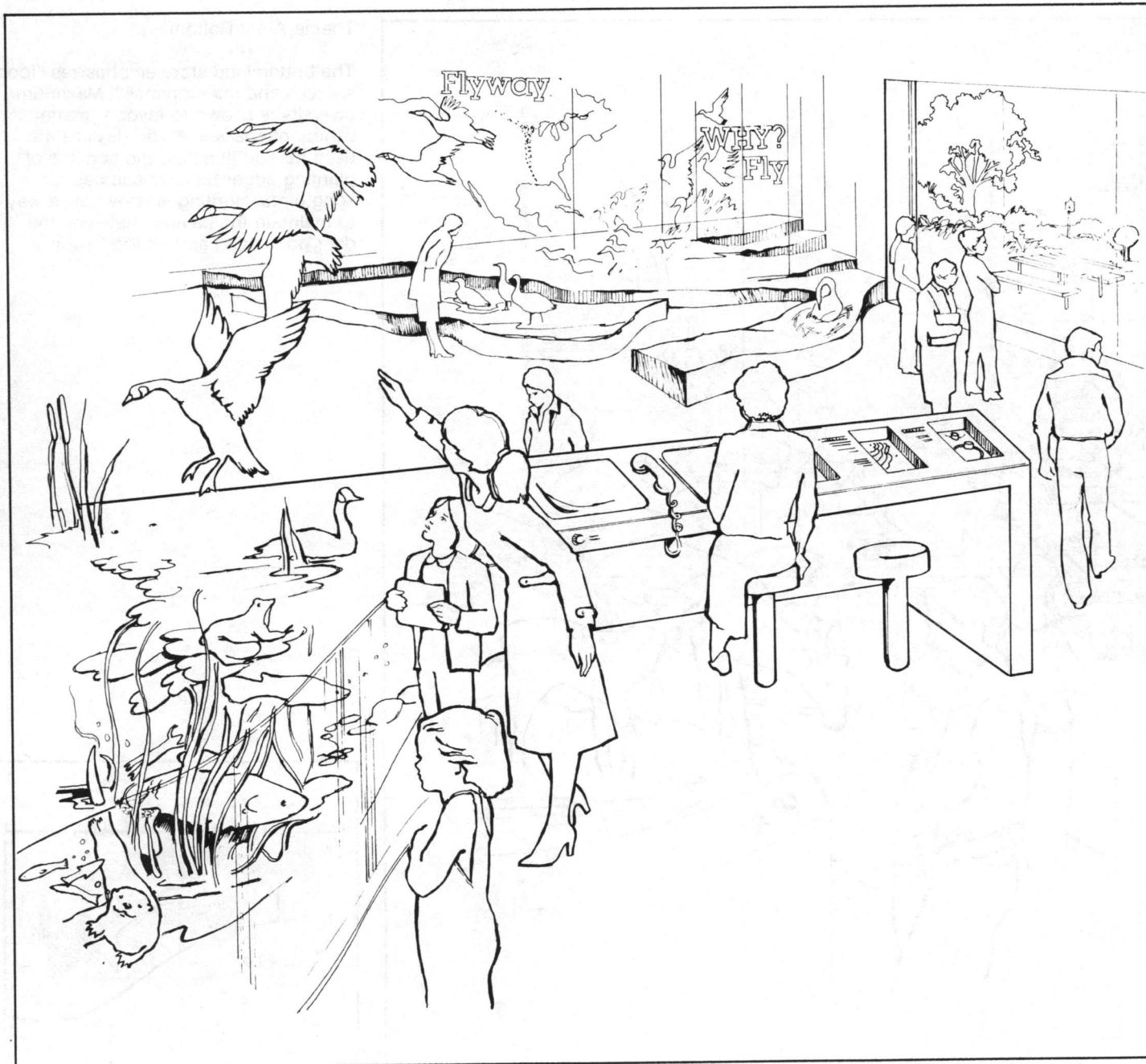


Exhibit Design



Theme Area: Bottomland

Wildlife managers are re-introducing otters to the Minnesota River and its tributaries. Their survival is shown to depend on water quality. Frogs, turtles, fish, endangered mollusks and waterfowl are shown as a food chain and dependent on water management.

Theme Area: Bottomland

Interactive devices, telemetry and other research techniques let the visitor experience a sense of how biological discovery supports wildlife management.

A model backyard exhibiting real wildlife is adjacent to the bottomland and introduces the migratory bird exhibit.

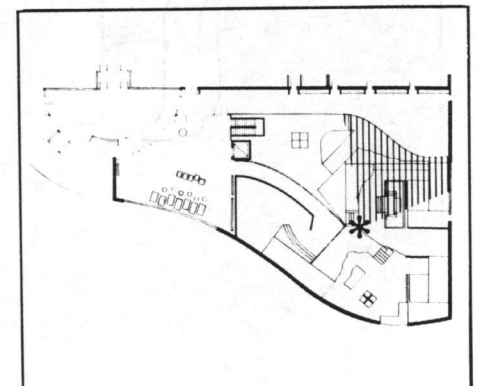


Exhibit Requirements (continued)

Requirements: Component 4b: Bottomland

The second major exhibition space adjacent to the ecosystem diorama will deal with succession, stratification and edge effects on the bluff and the bottomlands. The white tailed deer and assorted birds will be used to explain the management techniques used to maintain food supply.

Architectural Requirements:

Size: 600 to 800 sq. ft.

Levels: ramp or stairs down ½ level

Lighting: Daylight and artificial light

Relationship: adjacent to Eco/Diorama

Storyline: Bottomland

Moving down and along the valley, it is common to see habitats in transition, from what were once grassy openings or farm fields toward mature forests, either on the bluff slope or on the bottomlands. This gradual change takes place as new species invade (often as seeds on the wind or in bird droppings deposited along fence rows). The invaders grow to be replaced later by more shade tolerant trees. The succession can be purposefully manipulated through management.

Maximum diversity is usually favored, since this pattern of vegetation usually supports a greater variety of species. White tailed deer benefit from selective cutting of forests and creation of new openings to encourage the sprouting of succulent saplings. With a constantly maturing food supply causing browse to get out of reach, and with ineffective means of controlling deer populations, deer can face starvation in winter, when food is scarce.

Heavy snow concentrates deer in sheltered yarding areas, making them vulnerable to predation from free-roaming dogs. Chasing weakened deer can cause them to die from shock, energy loss and exposure, or cause them to abort the next year's fawns. Winter feeding sometimes aggravates the problem by promoting excessive population growth and increased stress from food shortages in succeeding years.

Hunting is one effective means of maintaining wildlife populations within limitations of food supply. The deer hunter assumes the role of predator, substituting for the wolves, cougars and Indians that once helped to control deer populations. With ample winter food to support a reduced deer herd, healthier fawns are born the following season, restoring the population to its previous level.

Wildlife researchers can help managers understand habitat needs of deer and other wildlife by monitoring their daily activities through radio tracking. A display allows visitors to tune in a radioed animal to discover the habitat it is using and to follow its recent movements.

Another display shows the effects of setting back succession on song birds. They are shown to select different strata for nesting, perches and food gathering, which gives a clearer understanding of the importance of "edges", and provides handy clues for the novice birdwatcher.

Exhibit Requirements (continued)

Requirements: Component 4c: Wetland

Descending to the next exhibition space adjacent to the diorama is an interactive exhibit which deals with food chains and marshes. The related management techniques will be illustrated with muskrats, great blue herons and other smaller species.

Architectural Requirements:

Size: 600-800 sq. ft.

Levels: Ramp or steps down ½ level

Lighting: Artificial

Relationship: Adjacent to Eco/diorama

Storyline: Wetland

Spring fed marshes, trapped between the bluffs and a natural slit levee that runs along both sides of the river, provide habitat for a complex wildlife community. The muskrat is the chief architect of marsh homes for wildlife, and the refuge manager is obliged to work with it.

By chewing openings throughout dense stands of cattail and river bullrush, and by building mound houses and smaller feeding stations, this rodent gives water birds a place to swim or wade looking for food, and to loaf a nest on those handy platforms.

A display features the muskrat's family life, its unique adaptations to the marsh environment, the role and traditions of trapping in population management and disease control, and the stresses represented by winter and flooding.

A second display features another important member of the wetland community, the great blue heron. Like the rich food base of rodents that supports prairie predators, abundant marsh fish life, frogs and turtles are consumed by herons. Because food chains concentrate chemicals like the PCB's that are presently found in Minnesota River fish, the heron is shown to be an indicator species, reflecting possible dangers to human populations. Reproduction is often the first thing visibly affected, so birds are mounted or pictured in a nesting colony feeding fish to their young.

A third display shows the wide variety of management techniques used at Minnesota Valley, from the creation of loafing areas to construction of impoundments, dikes, control structures, and from pumping or flooding for moist soil management for food plant stimulation to drawdowns to provide shorebird feeding flats or rough fish control.

A final display focuses on other refuges for wildlife in river valley environments along the Mississippi Flyway, parallels in their habitat management programs, and how the network of refuges are managed to benefit a variety of migratory-bird species like the wood duck.

Exhibit Design

Theme Area: Wetland

Passing through and under the migration and National Wildlife Refuge System display, the visitor is introduced to the muskrat, the manager's partner as a creator of wetland habitats. The theme focus is "family, neighbors and interdependence." A cutaway view of a spring fed marsh featuring herons is used to show how PCB's or other pesticides work their way through the food chain to harm animals. Reproduction and management for reproduction will also be featured.

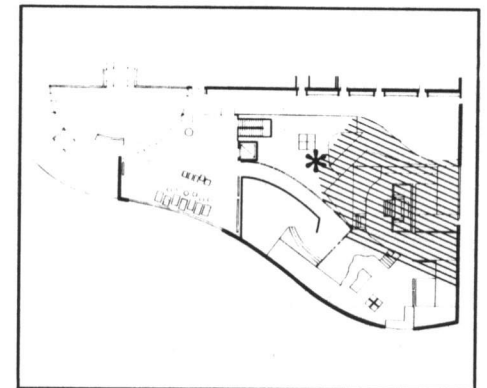
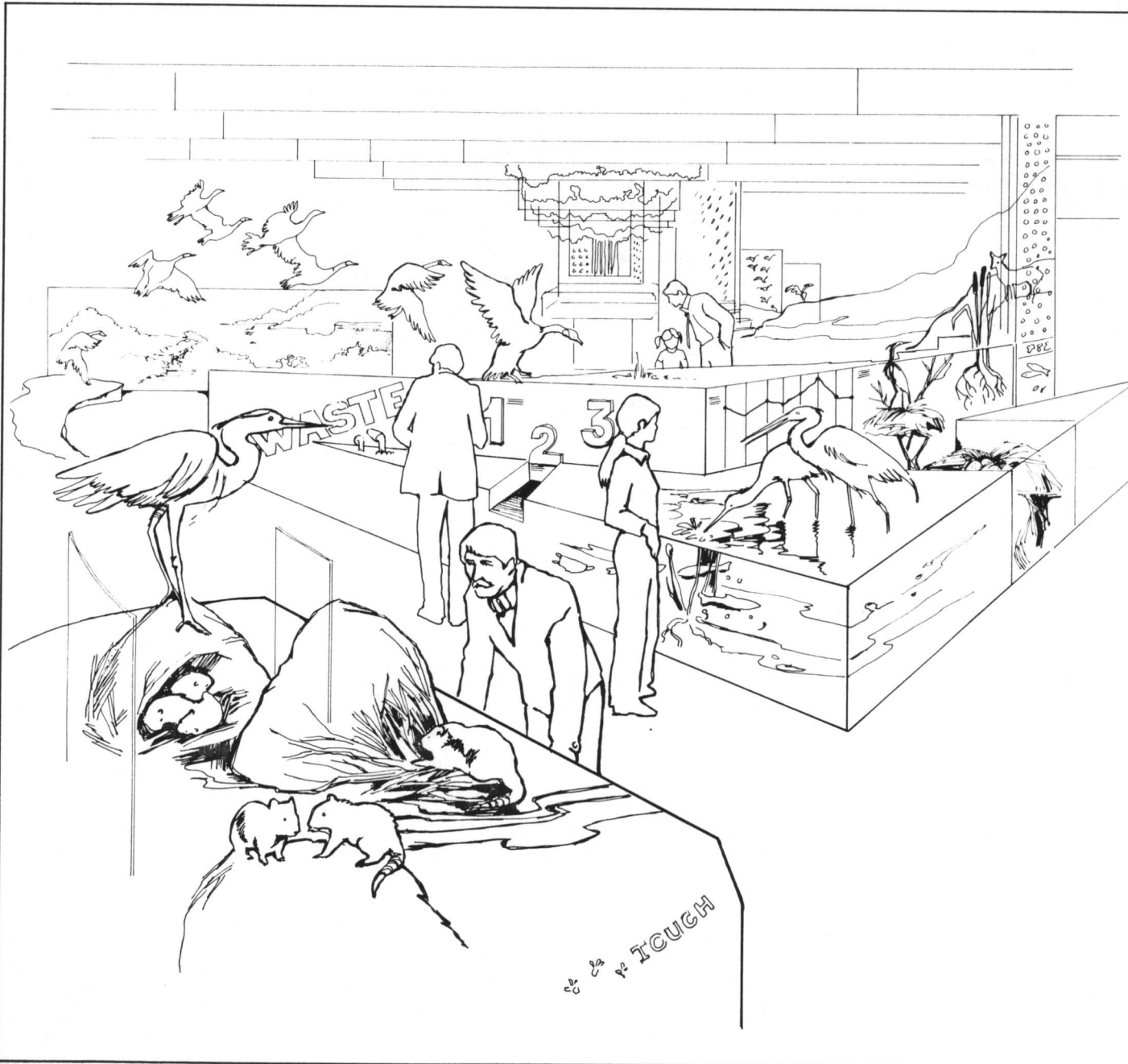


Exhibit Requirements (continued)

Requirements: Component 4d: Floodplain Impacts

The fourth major exhibition space adjacent to the diorama will show general flood plain neglect, upstream drainage, pollutants, etc., and what is needed to reduce the human impact on the refuge.

Architectural Requirements:

Size: 600-800 sq. ft.

Levels: ramping, or stairs down ½ level

Relationships: Adjacent to classrooms

Other: Exit to refuge

Storyline: Floodplain Impacts

Bottomland hardwood forests and other floodplain wildlife habitats along the rivers of the central U.S. are among the nation's most abused and endangered environments. A display shows how river valleys are being affected by advancing human population, development and degradation in the U.S. and in other countries.

Another display focuses on specific impacts in the Minnesota Valley: energy flow is compared between natural and man-made systems and how one affects the other . . . waste disposal and pollutants are traces . . . effects of drainage upstream are related to increased flooding . . . agricultural pest control reveals its effect on wildlife . . . and human self-regulation or limiting factors on our own excess are examined.

Finally, basic management concepts, techniques and application of ecological principles to questions regarding human survival are explored in a simulation game that models decision-making from the national to the backyard level.

Exhibit Design

Theme Area: Floodplain Impacts

A huge interactive game board consisting of the whole river valley will be programmed to allow visitors to make environmental decisions and see the results. They will see the relationships between natural and man made systems, trace energy flows and see how waste disposal and pollutants affect the whole system.

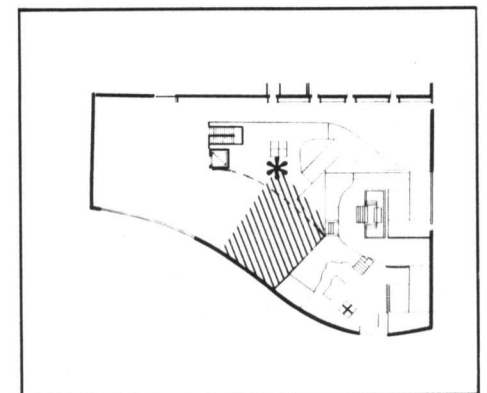


Exhibit Requirements (continued)

Requirements: Components 5: Seating and Gallery

This space should provide a relaxing atmosphere with seating surrounded by wildlife art (top quality) and provisions for temporary displays, historical memorabilia as in a Hall of Fame.

Architectural Requirements:

Size: 800-1000 sq. ft.

Levels: (2) up ½ level, and another ½ level

Lighting: Natural and artificial

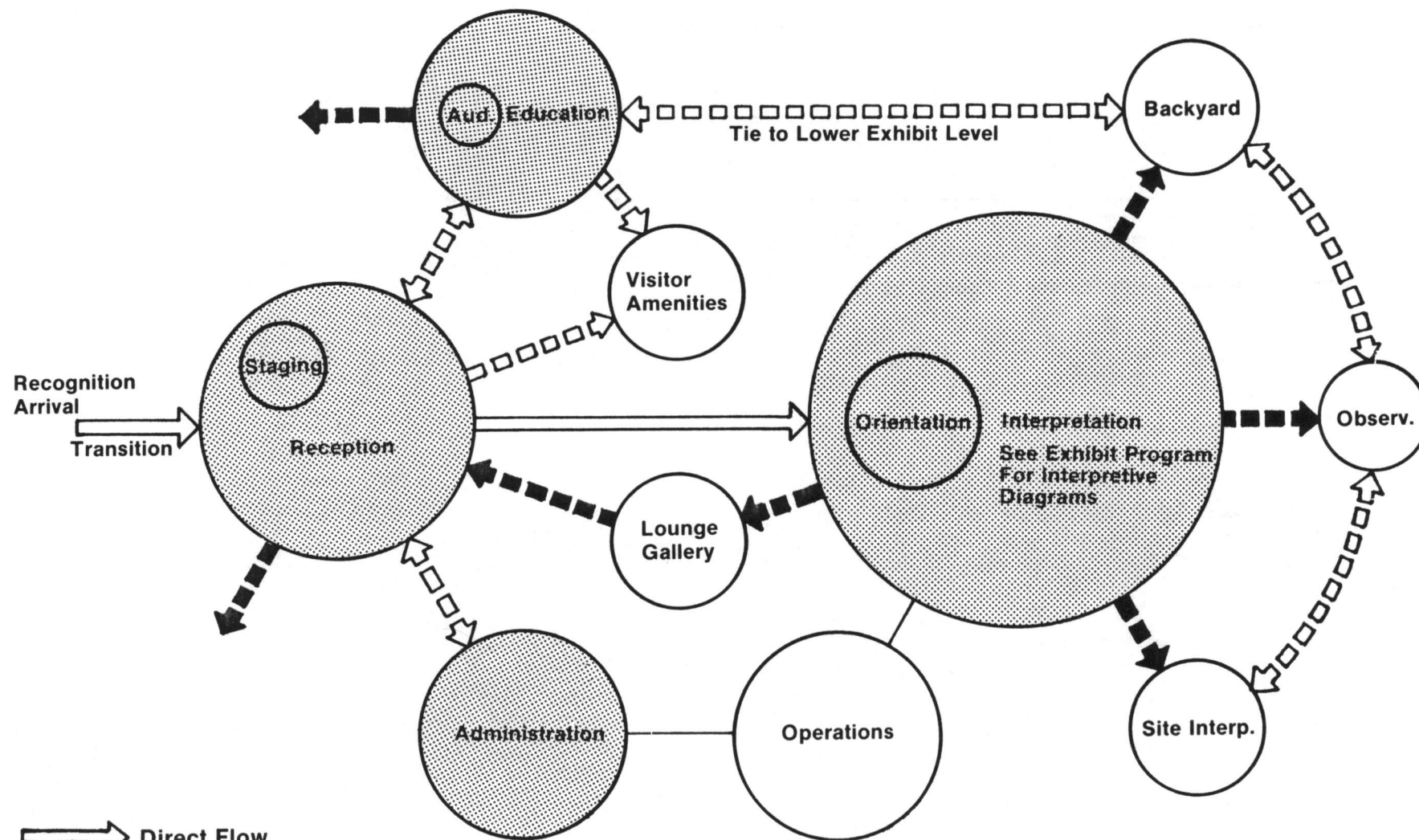
Relationship: At end of exhibit circulation, close to reception and information areas.

Storyline/Content: Seating and Gallery

The main exhibit area empties into a large, restful open space that is interspersed with comfortable seating and panels displaying a limited but select assortment of wildlife art.

The gallery ties back to the reception area and rest rooms near the entry. It includes a Hall of Fame display that features three or four individuals who have made outstanding contributions to the field of wildlife conservation. In addition to names, photo portraits and descriptive materials, and illustration of accomplishments, the display features an honor roll of all those who have been previously chosen for recognition--these individuals can be rotated back into the display at regular intervals.

The size of the gallery/hall of fame space should depend more on circulation needs than display characteristics. Its purpose is to show how human understanding and appreciation of wildlife is expressed artistically, and that conservationists merit recognition and lasting respect.



Functional Relationships
Visitor Circulation Flow

Part IV Implementation

Current Comprehensive Budget Analysis

Site and Facility	\$3,362,000
Interpretive Exhibit Construction	800,000
Furnishings and Equipment	65,000
Site and Facility A/E Fees	275,000
Exhibit Design Fee	200,000
Interior Design Fee	12,000
Total	\$4,714,000

Note: An active solar system for the center will cost \$259,000.

Part V: Credits

We gratefully acknowledge the enthusiastic support and participation of the following in making this brochure possible:

Minnesota Valley Citizens Committee
U.S. Department of Interior
Fish Wildlife Service
Minnesota Department of Transportation
City of Bloomington, Minnesota

Part IV: Appendix

The Space Program/Architectural Requirements

Space Category	Content	NSF	GSF
Primary Spaces			
1. Primary Spaces	Non-building related, publicity, awareness, signage, etc.	-0-	
2. Arrival	Non-building related, experience of exterior space.	-0-	
3. Transition	Lobby, vestibule, adjustment in mood prior to event - transition from arrival to reception. Space need not be entirely enclosed. A staging space to accommodate 80 people at 15 sf per person.	1,200	
4. Reception	Space 24% shared with Transition. Within this space is a reception counter, informal seating, circulation to visitor amenities, coats, public toilets, Center shops, etc., and space for alternative tour staging and reception, i.e., to orientation, to site interpretation, by-pass to detail interpretation or to visitor amenities. Sixty people at 15 sf per person = 900 sf net x 1.4 net conversion.	1,260	
a. Staging	A space immediately contiguous to and part to reception, with a separate entry from outside accessible to large groups at arrival for touring. It must have direct access to visitor amenities. Eighty people at 7 sf per person. Provide a separate entry into the classroom areas for large groups.	560	
b. Visitor Amenities	Public Rest Room - Men's Room 2 water closets 2 urinals 3 lavatories	150	

Architectural Requirements (continued)

Space Category	Content	NSF	GSF
Primary Spaces, cont'd			
	Public Rest Room - Women's Room		
	3 water closets		
	2 lavatories	130	
	Coat room - space for hanging 150 coats	120	
	Lounge Gallery		
	Wildlife art exhibit	800	
	Hall of Fame		
	Vending area		
	Sit-down space for Vending - 30 people at 15 sf per person. Relate to Reception area.		
	The Visitor Center Shop (operated by the Refuge Cooperative Association)	400	
	NOTE: The final design resolution will determine the appropriate "mix" of reception space with visitor amenity space.		
5. Detailed Interpretation	One or more volumes which contain overview - orientation and a flexible gallery seating area with four major "theme" areas.	8,600	
		13,220	
	See interpretive exhibit program for detailed functions.		
	NET TO GROSS CONVERSION X 1.2		15,864

Architectural Requirements (continued)

Space Category	Content	NSF	GSF
Ancillary Spaces			
1. Administration/ Operation			
a. Reception/ Information Area	Informal seating with information counter for clerk/receptionist	350	
b. Office Suite - Cluster 1	Refuge Manager 200 Assistant Refuge Manager 150 Unassigned 150 Administrative Technician (Business Manager) 150 Stenographer-Clerk-Radio Base Station 100	750	
c. Offices - Cluster 2	Supervisory Outdoor Recreation Planner-Relate to Assistant Refuge Manager Environmental Education Specialist 150 Law Enforcement Specialist 150 Interpretation Specialist 150 Exhibit Specialist 150 Landscape Architect 150 Wildlife Biologist 150	900	
d. Open Office	Unassigned - includes refuge manager trainee, work study, part-time volunteer workers, draftsment, Biological and Park Technicians.	1,000	
e. Active Storage	Locate near stenographer-clerk. Provide storage cabinets with stainless steel sink.	100	
f. Conference/ Meeting Room	Adjacent to Refuge Manager's Office	500	
g. Storage for Conference Room	Adjacent to Conference Room	150	
h. Staff Entry	Direct entry from staff parking. Provide coat area.	100	

Architectural Requirements (continued)

Space Category	Content	NSF	GSF
Ancillary Spaces (Cont.)			
i. Mud Room	Adjacent to Staff Entry and Staff Rest Rooms. Provide shower and ten full-sized lockers. Provide dressing space not part of the locker room.	50	
j. Library, Staff Lounge, Map Room	Relaxation space for staff and volunteers, counter for food and drink preparation, table with casual chairs, sofa	350	
k. Staff Rest Rooms	Adjacent to Lounge Men - 1 water closet, 1 urinal, 2 lavatories Women - 2 water closets, 2 lavatories	240	
l. Staff Work Room	Space for duplicating equipment, including Ozalid printer, and files with counter for assembly of documents; provide dark room	200	
m. Technical Work room	Systems management containing monitor board with work space for A/V repair, phone systems	120	
n. Shipping, Receiving, Janitorial	Receiving dock, overhead door to 12' high bay	300	
o. Exhibit Preparation	A space within which exhibits will be received, assembled, repaired, and deployed to areas within the detailed interpretation space - graphics area. Adjacent to Receiving Area.	400	
p. Exhibit Storage Preparation.	Provide for 12' high bay space adjacent to Exhibit	600	
q. Maintenance Supply Storage	Adjacent to Receiving Area	100	
r. General Storage	Adjacent to Receiving Area	500	

Architectural Requirements (continued)

Space Category	Content	NSF	GSF
Ancillary Spaces (cont'd.)			
s. Mech.-Electrical Equipment Room	Space for power generation, air handling, water treatment, electrical systems and elevator equipment room.	<u>1,500</u>	
	Energy considerations - project to be designed for active and passive solar systems. Owner encourages innovative design rather than the typical "chisel point" roof. Control an isolated number of panels for heating hot water all year. Wind-initiated energy saving devices are encouraged, along with the use of berms.	8,210	
	Energy requirements are as follows:		
	Roof R-38		
	Walls R-19		
	Btu/SF allowance 60,000		
	NET TO GROSS CONVERSION X 1.45		11,905
2. Educational			
a. Entry-Exit	Provide separate entry-exit for education area for busloads of visitors. Provide coat area with hard-surfaced floor.	200	
b. Science Lab	Provide sink in work counter, refrigerator and range. Provide folding partition to classroom.	500	
c. Auditorium	One hundred twenty people seating capacity at 16 sf each, including projection booth. Seating is to be provided in carpeted tiers. Provide rear access to classroom area. Provide direct access to Reception.	1,910	

Architectural Requirements (continued)

Space Category	Content	NSF	GSF
Ancillary Spaces			
d. Classrooms	Teacher training - night education courses, training work-shops; 2 @ 600 (separate with folding partition)	1,200	
e. Rest Rooms	Centrally located in classroom area Men - 1 water closet, 1 urinal, 2 lavatories Women - 2 water closets, 2 lavatories Custodian room		
f. Resource Center	Library documenting the Minnesota Valley River and the Minnesota River Valley. Provide for portable display and specimen storage.	<u>600</u>	
		4,720	
	NET TO GROSS COVERSION X 1.45		6,844
	TOTAL GROSS PROGRAM AREA		34,613
Outreach/Programs/ Facilities			
a. West End Facilities	Refuge Maintenance Complex NOTE: West and facilities are not part of this project. Further programming of west end facilities is to be done at a later date.		

Technical Statement

DIVISION 1 - GENERAL REQUIREMENTS

1. Summary of the Work

1.1 Scope of the Project

Provide all necessary labor, equipment and materials to construct the Wildlife Interpretation and Education Center in Bloomington, Minnesota.

The facility will be constructed in conformance to the drawings herewith submitted, and these outline specifications.

1.2 Wildlife Interpretation and Education

The Center will include:

Reception/Entry Space
Visitor Seating Areas
Interpretive Exhibits
Auditorium
Classrooms
Resource Center
Gallery
Vending Space
Retail Space
Open Office Space
Conference Space
Science Lab
Work Rooms
Employee Cafeteria/Lounge
Employee Lockers
Service Areas
Storage

DIVISION 2 - SITE WORK

1. Earthwork

1.1 Excavate for new construction of buildings, footings, walls and site improvements. Remove all underground structure, formations or obstructions of any type as required to complete the excavation to accommodate the designed facility. Remove excess material from site. Provide granular backfill material as placed and compacted in whatever quantities are necessary, including waste and spillage.

1.2 Support sides of excavation by sheeting or other approved systems. Contracting shall design and maintain system.

1.3 Dewater excavation and control water on site as needed.

2. Utilities

2.1 Connect development to city system in adjacent streets, for water, sanitary sewer, storm sewer, gas, electricity, telephone, etc. Provide meters, pits, valves, etc., for each separate connection if required by Utility Companies.

3. Landscaping

3.1 Work to include furnishing, installing and guaranteed materials, including topsoil shrubs, trees, plants, etc., as specified.

3.2 Landscape trees, shrubs, and plants to be placed in earth-lined pits, fertilized and guaranteed for one year growth.

DIVISION 3 - STRUCTURAL

1. Design Criteria

Structural design will be based on and meet the requirements of the Uniform Building Code, 1979 Edition. Design will meet the requirements of all applicable department of the City of Bloomington and the State of Minnesota.

Technical Statement (Continued)

- 1.1 Stresses
- Concrete @ 28 Days _____ F'c = 4,000 psi
Reinforcing Steel (Grade 60) _____ Fy = 60,000 psi
Structural Steel A-36 Fy = 36,000 psi
Structural Steel A572 (Grade 50) _____ Fy = 50,000 psi
Bolts High-Strength _____ ASTM A-325
Bolts High-Strength _____ ASTM A-490
- 1.2 All reinforced concrete work will be designed by ultimate strength design, as per code requirements for reinforced concrete. (ACI 318-71)
- 1.3 Buildings designed per ACI Building Code, AISC Building Code, and Uniform Building Code.
- 1.4 Live loads will be stated in the building codes or minimum live-loads as follows:
- Roof (Snow) _____ 40 psf
Mechanical Equipment Rooms _____ 150 psf
Storage _____ 100 psf
Stairways _____ 100 psf
Receiving (Truck Entry to Exhibit Hall)
Uniform _____ 250 psf
Concentrated _____ 16 kips
Wind Load 1. Up to 50'-0" _____ 30 psf
Seismic Load _____ Zone 1
2. Structure of Wildlife Interpretation and Education
- 2.1 Foundation will be spread footings.
- 2.2 The columns and beam framework will be structural steel.
- 2.3 The roof structure will be of steel joists and metal deck.
3. Exposed Concrete
- 3.1 Design will make provisions for expansion joints, water bars, and waterproofing.
- 3.2 All exposed exterior concrete shall be cast-in-place concrete.

4. Fire Proofing

- 4.1 Structural steel will be fireproofed as necessary according to Code.

DIVISION 4 - MASONRY

Unit Masonry

- 1.1 Pattern concrete block shall be lightweight hollow, load bearing, textured faced, modular size, concrete masonry units conforming to ASTM C90, Grade N, Type 1.
- 1.2 Standard concrete block shall be lightweight hollow, load bearing, smooth faced, modular sized, concrete masonry units conforming to ASTM C90, Grade N, Type 1.
- 1.3 Stone - to be selected by architect.
- 1.4 Mortar mix shall be of an approved laboratory design mix with a minimum compressive strength of 750 psi (Type N).
- 1.5 Joint reinforcement shall be ladder type with deformed longitudinal members and galvanized cross ties, No. 9 wire.
- 1.6 Provisions shall be made for bond beams and lintel beams, reinforcing rods and expansion joints.
- 1.7 Steel reinforcing bars shall conform to ASTM A615, Grade 60.

DIVISION 5 - METALS

1. Stair Railings/Stairs

- 1.1 Interior stair railings will be 1-1/2" standard steel pipe with all connections welded and all welds ground smooth.
- 1.2 All fire stairs will be prefabricated metal with closed risers, concrete filled treads and pipe railings.
2. Lightgage Framing
- 2.1 Steel studs will be 3 5/8 inches wide, 25 gauge, spaced 16 inches on center. Provide running channels at floor and ceiling with intermediate bracing as necessary.

Technical Statement (Continued)

- 3. Expansion Joints
 - 3.1 Provide expansion joints with covers as required.
- 4. Miscellaneous Metals
 - 4.1 Miscellaneous steel lintels will be furnished as required for openings cut through masonry walls for ductwork and doorways where required.
 - 4.2 Provide steel angle and channel hangers and framing throughout as required.
- 5. Painting
 - 5.1 Before leaving shop all steel will be thoroughly cleaned of all loose mill scale, rust weld slag or flux deposit or other foreign matter.
 - 5.2 All steel work will be given one shop coat of a first class rust-inhibitive primer. Following steel erection, scratches and scars will be touched up by the steel erector.

DIVISION 6 - WOOD AND PLASTICS

- 1. Shelving
 - 1.1 Janitor closet shelving will be pine with painted finish.
 - 1.2 All closet and storage shelving shall conform to requirements of Section 600 of Architectural Woodwork Institute (AWI) "Quality Standards." Shelving shall be of softwood or particle board.
- 2. Rough Carpentry
 - 2.1 Lumber for nailers, blocking, etc., shall be No. 2 or better grade Douglas Fir or Southern Pine.
 - 2.2 Wood roof blocking shall be rot resistant.
- 3. Paneling

- 4. Cabinets
 - 4.1 All cabinets, cases, counters, shelving, etc., shall conform to requirements of Section 400 of Architectural Woodwork Institute (AWI) "Quality Standards."
 - 4.2 Construction shall conform to the following design as shown in the AWI publication, "Architectural Casework Details" - flush overlay.
 - 4.3 Hardware finish shall be dull chrome plated, US26D.
 - 4.4 All standing and running trim shall conform to requirements of Section 300 of Architectural Woodwork Institute (AWI) "Quality Standards."

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

- 1. Dampproofing
 - 1.1 Trowelled or spray-applied mastic to exterior face of foundations walls below at occupied Ground Floor spaces.
 - 1.2 Plastic sheeting under all slabs on grade at Ground Floor level shall be 4 mil poly-vinyl chloride sheet.
 - 1.3 Membrane through-wall flashing where required will be PVC Sheet.
- 2. Roofing
 - 2.1 Over all built up roof areas provide 20-year type asphalt and aggregate roofing with a fabric base flashing and with metal counterflashing on fiberglass insulation. Vapor barrier between metal deck.
 - 2.2 Asphalt will conform to ASTM D312-71. Type IV. Felts will be tarred felt conformint to ASTM D227-56, 15 pound Type.
 - 2.3 Aggregate for roof surfacing will be gravel or crushed blast furnace slag with 100 percent passing a 5/8 inch mesh and 100 percent retained on a No. 4 mesh.
 - 2.4 An acceptable roof expansion joint system will be provided.

Technical Statement (Continued)

3. Roof Accessories

3.1 Roof hatches and smoke hatches shall be as required.

4. Building Insulation

4.1 Foundation wall insulation where required will be expanded polystyrene plastic foam insulation.

4.2 Insulation for wall panels and exterior soffits will be fiberglass blanket insulation or rigid foam plastic.

5. Flexible Sealant

5.1 Flexible sealant will be polysulfide base compound with a polyethylene back-up material.

6. Exterior Facing Panels

6.1 Exterior facing panels will be an insulated metal wall panel. Color to be selected by Architect.

DIVISION 8 - DOORS AND WINDOWS

1. Entrances

1.1 Lobby concourse will be heavy-duty anodized aluminum stile & rail door with glass infill.

1.2 Exit doors will be flush hollow metal doors, with panic hardware and painted finish.

1.3 Exterior utility doors shall be of steel construction, painted.

2. Doors and Frames (Interior)

2.1 Hollow metal doors and frames with paint finish, typical.

2.2 Hardwood veneer solid core doors and hollow metal frames at selected office areas.

2.3 Hollow metal fire-rated doors and frames where required by code.

2.4 Metal louvers will be provided at doors as per mechanical requirements, and in conformance to code.

3. Hardware

3.1 Dull or polished chrome.

3.2 Cast aluminum closer housings.

3.3 Keying system as directed by Owner.

4. Windows

4.1 Clear insulating glass, glazed into anodized aluminum frames.

4.2 Spandrel panels will be opaque tempered glass of matching color with insulated back.

5. Special Doors

5.1 Motor operated, insulated overhead doors will be provided at the loading entrances.

DIVISION 9 - FINISHES

1. Floor Finishes

1.1 Quarry tile at visitor toilets.

1.2 Quarry tile in lobby.

1.3 Smooth-trowelled concrete with hardener and sealer at service and storage areas.

2. Base

2.2 2-1/2" vinyl carpet base at carpet areas.

2.3 4" high covered ceramic tile at showers.

2.4 Quarry tile base where Quarry tile occurs

2.5 Wood base at parquet floor areas.

Technical Statement (Continued)

- 3. Stairs
- 4. Interior Partitions
 - 4.1 Concrete block or steel stud and gypsum wallboard partitions painted 2-coat latex finish.
- 5. Wall Finishes
 - 5.1 Latex paint at utility and storage rooms.
 - 5.2 Ceramic tile at toilets and showers.
- 6. Ceilings
 - 6.1 Suspended acoustic tile at offices, meeting rooms, and classrooms.
 - 6.2 Gypsum board at toilets, locker rooms, showers, and dressing rooms.
 - 6.3 Latex paint at lockers and dressings.
 - 6.4 Two-coat epoxy at employee toilets and showers.
 - 6.5 Exposed structure elsewhere.
- 7. Fireproofing
 - 7.1 Structural steel required by code to be fireproofed will receive a fireproofing coating of paper thickness to meet fire-rating.

DIVISION 10 - SPECIALTIES

- 1. Louvers
 - 1.1 Exterior louvers will be metal with a color finish.
 - 1.2 Interior louvers will be metal, painted to match adjacent surface.
- 2. Access Panels
 - 2.1 Sheet metal access panels and frames will be provided throughout as required.

- 3. Toilet Compartments
 - 3.1 Toilet compartments will be wall mounted complete with doors and finish hardware.
 - 3.2 Wall mounted privacy screens will be provided at urinals where required.
 - 3.3 Finish will be baked enamel.
- 4. Toilet Accessories
 - 4.1 Wall hung fixtures, typical.
 - 4.2 Mirrors above lavs, with shelf, 1/4" polished plate glass with stainless steel frame.
 - 4.3 Paper towel cabinets in each toilet room, stainless steel finish.
 - 4.4 One handicapped stall in each toilet room.
 - 4.5 One low-mounted urinal in each men's toilet room.
 - 4.6 All toilet hardware and connecting devices to be vandal resistant.
 - 4.7 Two sanitary napkin dispensers in each large women's toilet room.
 - 4.8 One napkin disposal container in each women's stall.
 - 4.9 Trash receptacles will be provided in all toilet rooms.
- 5. Identifying Devices
 - 5.1 Exterior signs will be of cast bronze or anodized aluminum letters attached to walls.
 - 5.2 Interior signs will be solid acrylic plastic fiberglass, etc., with anodized aluminum frames where appropriate.
- 6. Lockers
 - 6.1 Single-tier lockers will be 12" x 12" x 72", 16 ga. Steel Painted finish, color as selected.

Technical Statement (Continued)

7. Folding Partitions

- 7.1 Provide acoustical folding partitions to subdivide areas in classrooms. Partitions will be all steel construction with vinyl finish to meet local codes. STC of 38-42 or better.

8. Fire Extinguishers

- 8.1 Fire extinguishers will be provided as required by code.

DIVISION 11 - EQUIPMENT

1. Waste Handling Equipment

2. Loading Dock Equipment

- 2.1 Provide dock bumpers of hard rubber at edge of slab along dock.

3. Vending Equipment

- 3.1 Rough-in for vending to be part of this contract but not the equipment.

DIVISION 12 - FURNISHINGS

1. Furnishings

- 1.1 All furnishings to be selected by architect.

DIVISION 15 - MECHANICAL

1. Plumbing

- 1.1 A complete building plumbing system will be provided as required by code, including interior sanitary sewer of cast iron pipe.

- 1.2 A domestic hot and cold water system of galvanized steel or type "L" copper will be installed.

- 1.3 A 75 gallon gas fired hot water tank, located in the mechanical room, will be installed.

- 1.4 Electric drinking fountain water coolers shall be provided, with at least one for handicapped use.

- 1.5 All plumbing fixtures provided shall be better than standard grade with flush tank water closets in non-public toilet rooms.

2. Heating, Ventilating, and Air Conditioning

- 2.1 Building heat will be provided from a 100 H.P. gas, hot water boiler. A hot water circulating system will serve fin tube radiation in areas with exposed floors and outside glass, and reheat coils in gallery and theater spaces.

- 2.2 Cabinet unit heaters will be provided at entrances to the building.

- 2.3 Building cooling will be provided by a 120 ton air cooled densing system.

- 2.4 Ventilation will be provided by a 30,000 CFM variable air volume supply unit located in the mechanical room. Air will be supplied and returned by exposed ductwork.

- 2.5 A toilet exhaust system will be installed.

- 2.6 Temperature control zones will be arranged so as to provide one zone for each room. Each zone will be provided with a day/night thermostat for energy conservation.

- 2.7 Humidification will be provided by electric duct humidifiers.

3. Temperature Control

- 3.1 A complete pneumatic temperature control system will be provided which shall control the heating, cooling, and ventilation systems.

- 3.2 A control panel shall be located in the mechanical room to permit start-up operation of the air handling and automatic time clock operation.

4. Fire Protection

4.1 A complete sprinkler system will be installed in accordance with N.F.P.A. requirements.

5. Special Systems - Optional

5.1 A 5200 sq. ft. flat plate solar collector system will be installed capable of space, domestic water and ventilation air heating.

DIVISION 16 - ELECTRICAL

1. Service and Power Distribution

1.1 A 120/208 or 277/480 volt, 3 phase, 4 wire service will be brought to the Center.

2. Lighting

2.1 The lighting system will be designed to harmonize with the mood and character of the building as well as provide adequate light levels as recommended by the Illumination Engineering Society.

2.2 Fluorescent lighting fixtures will be used in offices, conference rooms, etc.

2.3 Incandescent, directional lighting equipment will be used for displays.

2.4 Battery powered emergency lights will be provided for egress.

3. Telephone system

3.1 Empty conduit and outlet boxes will be provided to accommodate telephone wiring and equipment.

4. Fire Alarm System

4.1 An early warning fire and smoke detection system will be provided. This system will be designed to alert the building personnel to a fire before the sprinkler system is activated.

4.2 A connection to the flow alarm will also be provided.

5. Exterior Lighting

5.1 A low silhouette exterior lighting system will be provided throughout the site.

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