FIGURES

CONTEXT AND SCALE

Exploring the site in terms of its historical and physical context, scale, and geometry, one finds a rich history that provides architectural direction for the design of a Museum of Film and Photography on the National Mall.

A Place in Time

When George Washington surveyed the Potomac River at the behest of the First Congress to choose a site for the nation's capital, he chose the confluence of the Potomac and Eastern Branch (Anacostia) rivers. Just below the fall line, the area could be reached by ocean-going ships. Composed of sands, gravel, and clays over 1,000 feet deep, [1] the land to the east of the Potomac was formed by sediment from the Blue Ridge Mountains. The flow of water created the terraced plateaus of Washington, D.C., that had become thickly forested.

Tiber Creek, the fourth largest source of water in the city, and many of the smaller creeks and springs are now part of a network of sewer lines and tunnels. Until the construction of the National Mall diverted its flow from the Potomac to the Anacostia river, Tiber Creek flowed along what is now Constitution Avenue. A large market occupied the land that is now the site of the National Archives. Part of Tiber Creek became the Washington Canal, which flowed south of the market. It provided access for small barges then turned south, crossing the Mall in front of the U.S. Capitol.

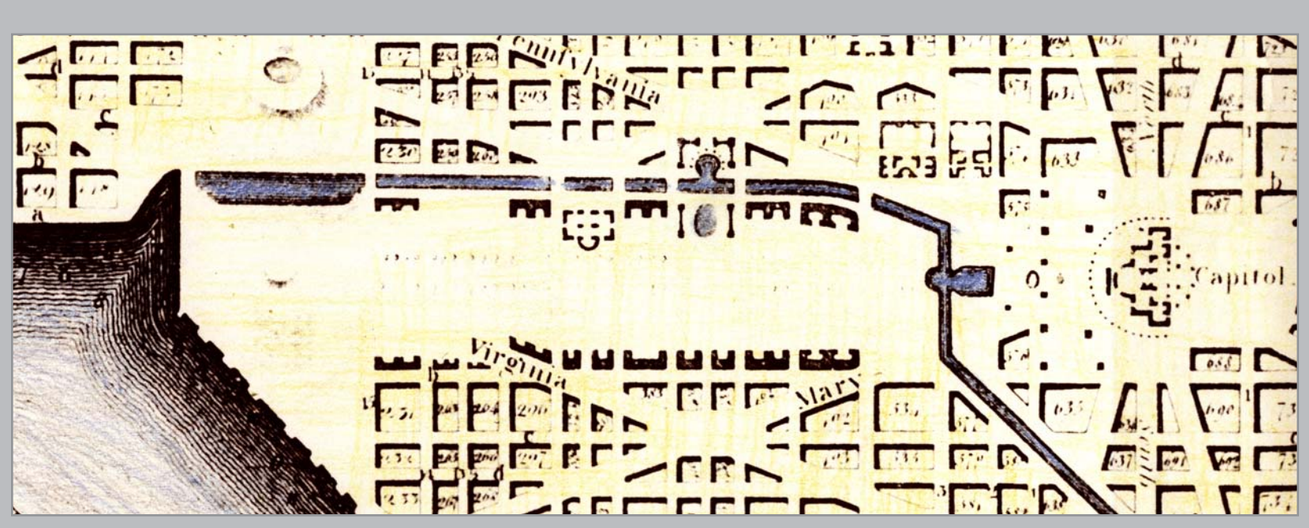


Fig. 1.1 Pierre Charles L'Enfant's plan for Washington, D.C., National Capital Planning Commission in cooperation with the District of Columbia Redevelopment Land Agency, *Downtown Urban Renewal Area Landmarks*, summer 1970, 1.

1 Olson, Steve, "A Sedimental Journey". *Washington City Paper*, July 30, 1993, 26.

Genesis of the Mall

In 1785 the Continental Congress established that the means of surveying and settling of western lands be done using the American Continental grid. Each six-mile square township would be divided into one-mile square sections. Townships, which evolved from New England communities, had at their centers a commons or town green. On these greens the religious and secular life had its center in the meeting house. “When the township and the grid became codified as a national pattern, the town square was unconsciously codified as well… Just as the U.S. Constitution became the secular covenant of our national values, the town square, as the actual and symbolic center of the township, became the symbol and the place where those values were activated. The secularization of the meeting hall forced the church off the town square, and the township hall conjoined to the square have survived as symbols of our societal values.” [2]

Fig. 1.2 Ellicott and Banneker surveyed the District of Columbia using this instrument. Junior League of Washington D.C., *The City of Washington*, 1977, 48.

Fig. 1.3 L’Enfant plan printed as a handkerchief by the Philadelphia firm of Thackara and Vallance, Junior League of Washington D.C., *The City of Washington*, 1977, 52.

2 Threshold, Journal of the School of Architecture, Univ. of Illinois, 1994, 39.

From Pierre Charles L'Enfant's vision in 1789 of a city composed of boulevards radiating from circles, superimposed by a grid of streets in the cardinal directions, the city was founded. Thomas Jefferson had written L'Enfant "I would suggest to you the idea of doing it on a square sheet to hang corner upwards, thus the outlines being N.W. N.E. S.E. & S.W. the meridians will be vertical as they ought to be; the streets of the city will be horizontal & vertical…"[3] Diagonal streets and circles followed the European baroque and renaissance tenents of vistas with termini. The establishment of the grid was a step in the direction of a system of streets with no heirarchy. L'Enfant's centerpiece would be the Capitol building, located on Jenkins Hill, "a pedestal awaiting a monument." [4] He planned a grand boulevard, including two parks and extending to the Potomac River on its east-west access, and from the White House to the Potomac River on its north-south axis",encompassing 146 acres."[5] After years of sitting fallow while Pennsylvania Avenue flourished, the land intended for a boulevard was designated, in effect, our national town square, The Mall.

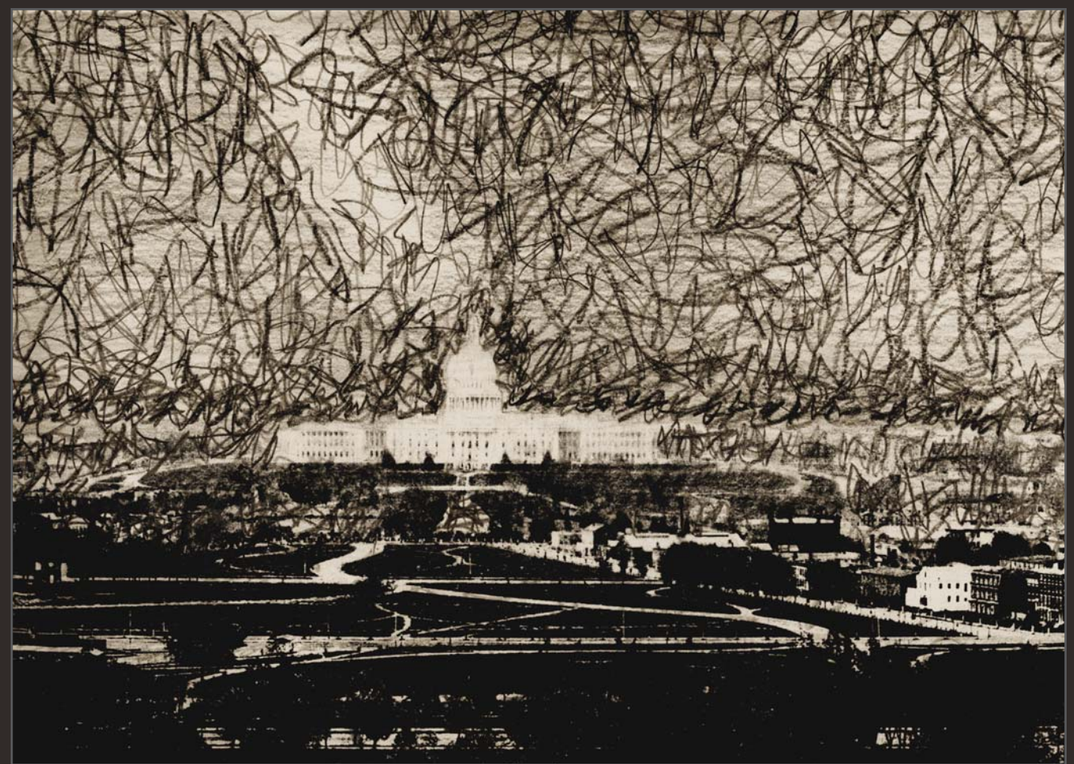


Fig. 1.4 View of the Capitol from the Mall (linework by author). Library of Congress, The Grand Design, 1967, 15.

3 Junior League of Washington D.C., The City of Washington, 1977, 51.
4 Associated Press wire story, May 22, 2000.
5 Junior League of Washington D.C., *The City of Washington*, 1977, 194.

Fig. 1.5 Pennsylvania Avenue and 7th Street, looking southwest (1903). Kelly, Charles S., *Washington, D.C., Then and Now*, 1984, 28.

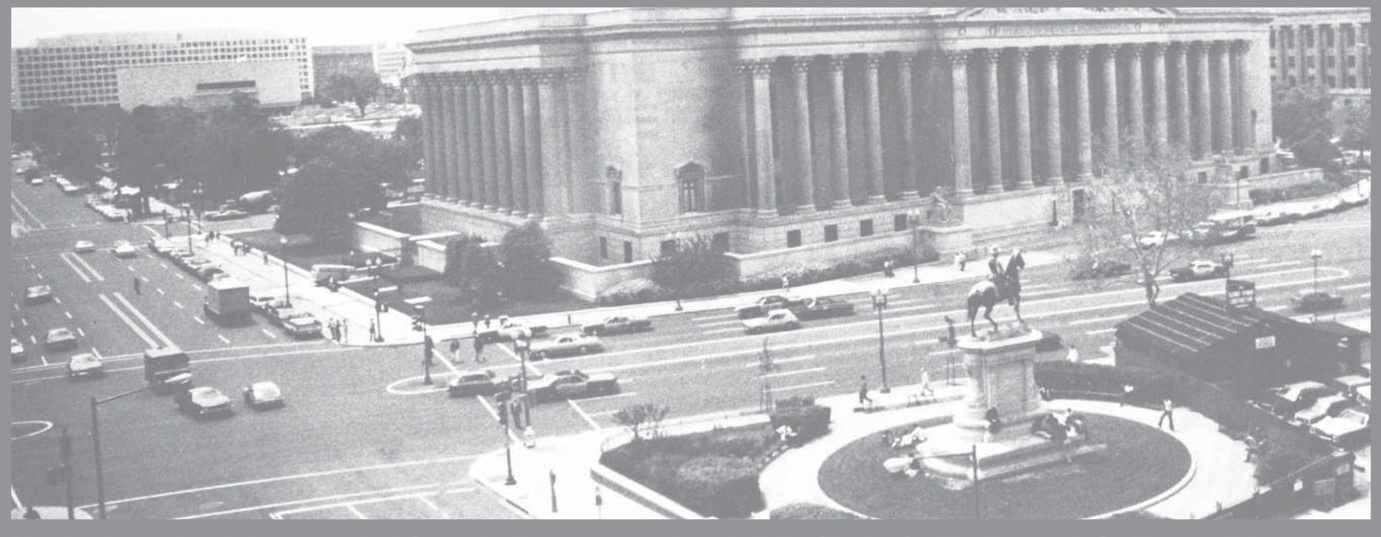


Fig. 1.6 Pennsylvania Avenue and 7th Street, looking southwest (1979). Kelly, Charles S., *Washington, D.C., Then and Now*, 1984, 29.

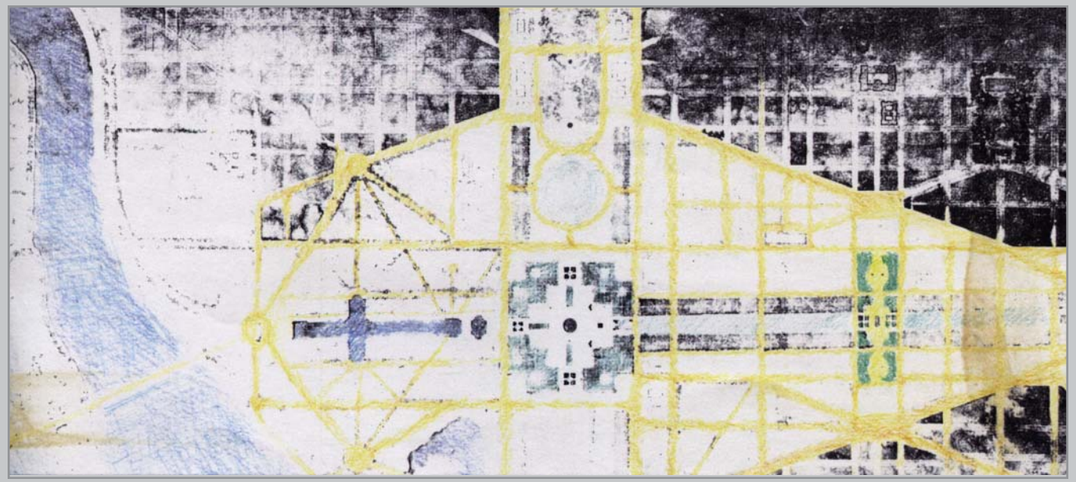


Fig. 1.7 The McMillan Plan of 1901. Library of Congress, *The Grand Design*, 1967, 16.

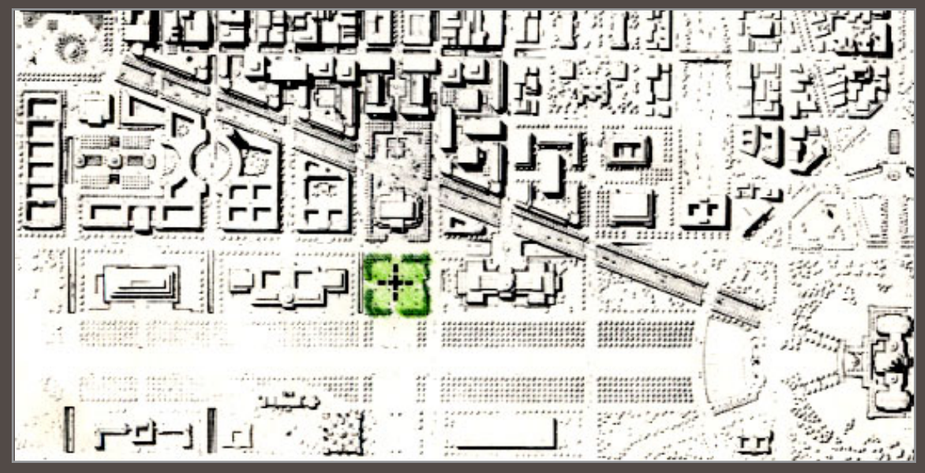


Fig. 1.8 The Mall Master Plan 1966, Skidmore, Ownings and Merrill. Library of Congress, *The Grand Design*, 1967, 21.

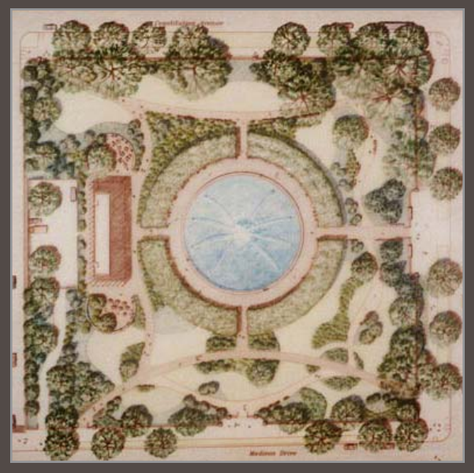


Fig. 1.9 National Gallery of Art Sculpture Garden, National Gallery of Art facilites drawing set, 1997.

The Mall Today

The Smithsonian Office of Design and Construction gave the following information (in feet):

United States Capitol (William Thornton; Benjamin Henry LaTrobe; Thomas U. Walter)	Top of wings- 70 Top of dome- 219
South side of Mall	
National Air and Space Museum (1972-1976, Helmuth, Obata and Kassabaum)	Glazed galleries- 64 Roof- 84
Hirshorn Museum and Sculpture Garden (1966-1974, Skidmore, Owings & Merrill)	Roof- 82
Arts and Industries (1879-1881, Adolf Cluss and Paul Schulze)	Roof- 55.5 Cupola- 96
Smithsonian Institution Building (1847-1851, James Renwick, Jr.)	Roof- 56 Cupola- 95.8
North side of Mall	
East Wing National Gallery of Art (Ieoh Ming Pei	Roof- 107.5
West Wing National Gallery of Art (1937-1941, John Russell Pope)	Roof- 68 Dome- 138
Natural Museum of Natural History (1904-1911, Hornblower and Marshall, 1960-1964 Mills, Petticord and Mills)	Roof- 85
National Museum of American History (1959-1964, McKim, Mead and White; Steinman, Cain and White)	5 Stories

A building on the site between the West Wing of the National Gallery of Art and the National Museum of Natural History would need a height of between 80 to 100 feet to match the monumental scale of the neighboring buildings. The length and width of the site are 500 feet, suggesting a building 4 times as wide as it is high, or a 1 : 4 ratio.

Trees at the thesis site, 7th and Constitution Ave.

Fig. 1.10 Mall vista, east from the Washington Monument. Kelly, Charles S., *Washington, D.C., Then and Now*, 1984, 7.

Fig. 1.11 The National Archives. National Archives and Records Administration, *General Information Leaflet,* No.1, rev. 1986.

PROTOTYPICAL MUSEUMS

The Kimbell Art Museum, by Louis I. Kahn had the most formal exterior procession, from parking, through an allee of trees, up broad, flat steps to a plinth, and into the central gallery space. Walking past half of the building to enter a museum with an entrance on axis becomes part of the approach. The repetitive alignment of narrow, linear, vaulted galleries and the orientation of these galleries to the sun was observed. The sun passes perpendicular to the light monitors, so that the light moves from one side of the room to the next each day—not allowing it to always rest on one wall, or on the other. I oriented the galleries in the design thesis in the same way. The reinforced concrete and limestone were appropriate materials to the climate.

Renzo Piano's Menil gallery, was similar in scale and locale to the Kimbell, as was its use of natural light. The quality of the rooms is remarkable in their feeling, due to the diffused light, restrained modern design of minimal intrusion, pockets of nature in small courtyards, and intimacy of the collection.

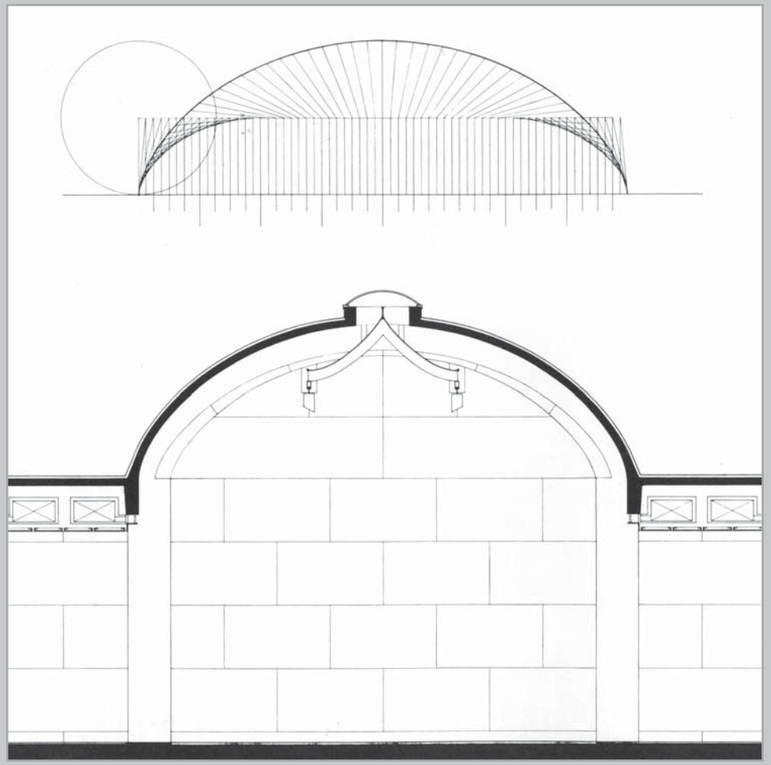


Fig. 2.1 "Modifier of the Light," by Louis I. Kahn. Johnson, Nell, E., *Light is the Theme*, 1975, 31.

Fig. 2.2 South Portico, *Menil Collection Museum Guide*

The scale of the High Museum of Art is larger than that of the Kimbell or Menil. It contains all of the major functional areas, at a scale where one can easily relate the parts to the whole. It was extremely valuable to have been given reduced copies of the building plans, as well as a tour by the facilities engineer. Tracing the path of the object through the facility eventually became an integral part of the thesis, as the functional relationships of the major activities drove the program and the plan.

Entering the High, there is a low ceiling and a four story central space. It is lit by clerestory windows. Arching ramps give motion and a vertical line, connecting the horizontal floors. They provide clear, visual pedestrian circulation. One of the most profound lessons learned was how essential a small amount of light is to a museum, and how undesirable too much light can be. This museum struggled to moderate the amount and quality of light with scrims added below the skylights in the galleries. Moving from the light flooded atrium into the galleries that had been darkened at a later time for a photography exhibit demonstrated the need for a gradual transition from light to dark. The High Museum also contained a theater of 176 seats. Knowing the number of seats allows one to comprehend the relative size of various theaters.

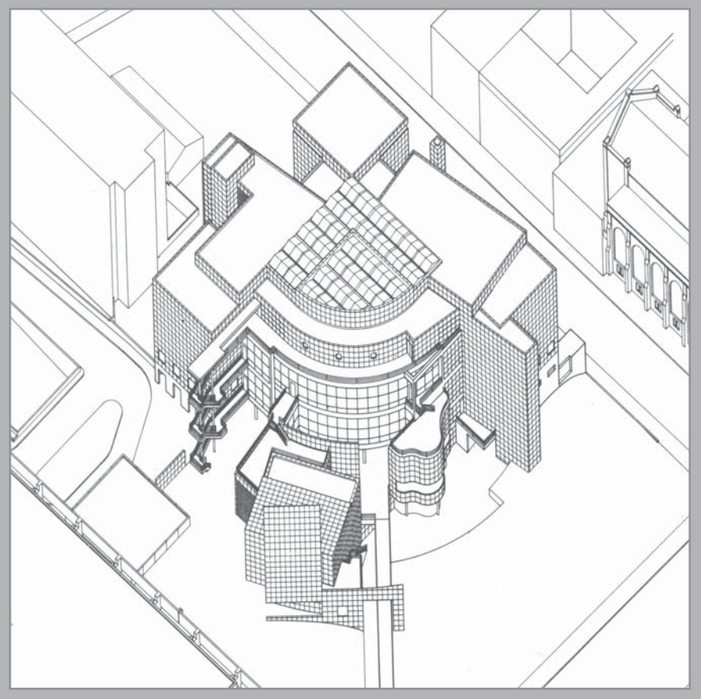


Fig. 2.3 Axonometric view from southeast, High Museum of Art. Searling, Helen, *New American Art Museums*, 1982, 106.

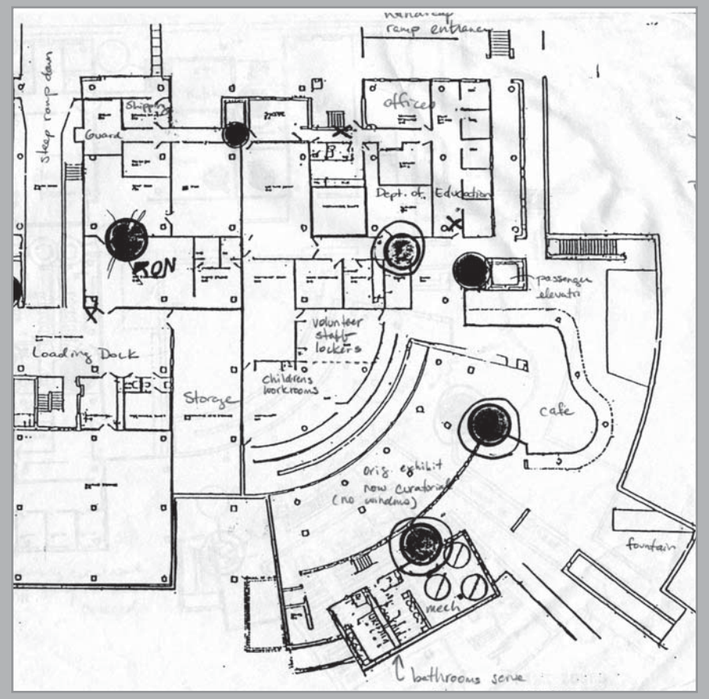


Fig. 2.4 Entry level, High Museum of Art, Richard Meier & Partners, Architects. Plan obtained from facility manager.

"It was most important that on entering, visitors understand the place, and researchers be aware of public programmes."[6]

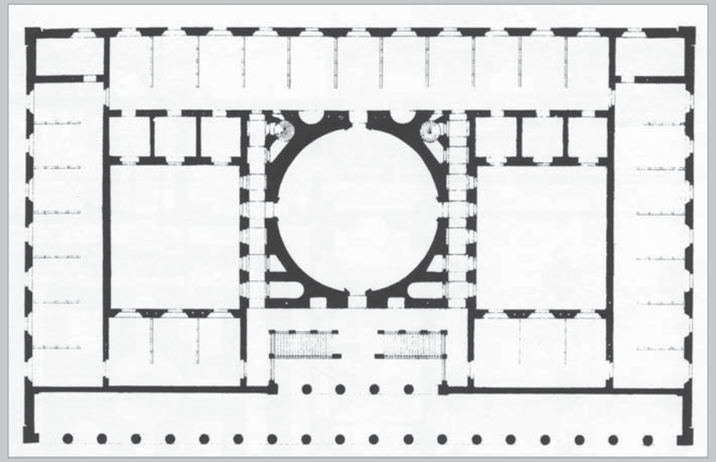


Fig. 2.5 Plan of upper floor, Altes Museum, 1823-30, Karl Friedrich Sckinkel. Searling, Helen, *New American Art Museums*, 1982, 18.

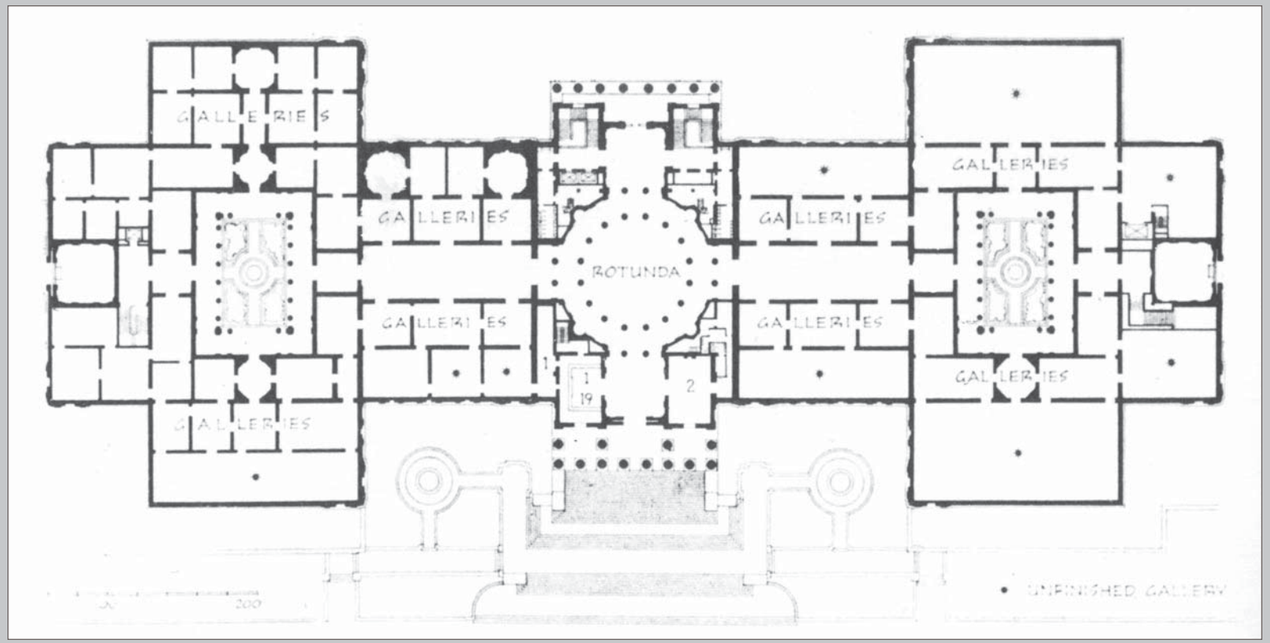


Fig. 2.6 National Gallery of Art, Washington, D.C., John Russell Pope, 1941. Searling, Helen, *New American Art Museums*, 1982, 40.

6 Richards, Larry, editor. Canadian Centre for Architecture Building and Gardens, 1992, 56.

The 146 acre Mall in Washington becomes part of the approach to the museums surrounding it. The National Gallery of Art, by John Russell Pope, has a formal, stepped entrance to a plinth, in the neoclassical style. The East Wing of the National Gallery of Art, by I.M. Pei, informed the scale, use of natural light, and programming of the thesis museum. Provided with a set of plans, the number of square feet of each area could be calculated, which helped determine the proportion of public to private space. The use of triangles in the plan relate to the shape of the site. The entrance is on the east--west axis with the West building. Because it contains a very large public space with circulation that provides access to several successions of galleries, it was the best example of scale for the design of a national museum.

For the thesis museum, I used a grid to divide the very large areas into 5-foot modules. Plans of the East Wing of the National Gallery show that the isoceles triangle was used at various scales to create the overall plan, exhibition spaces, skylights, stairs, etc.

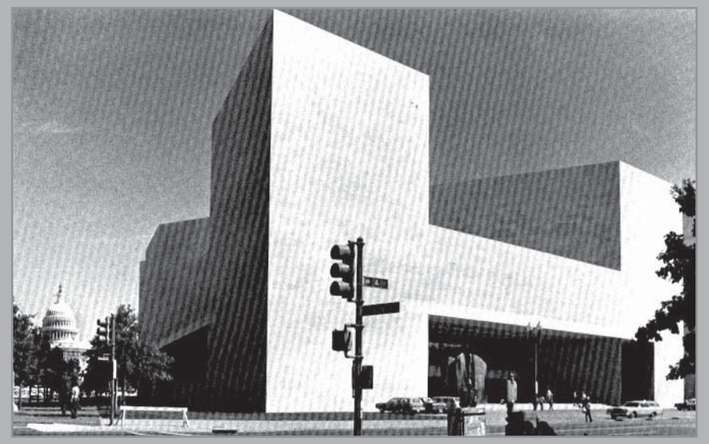


Fig. 2.7 East Building, National Gallery of Art, *Brief Guide and Plan*, 1993.

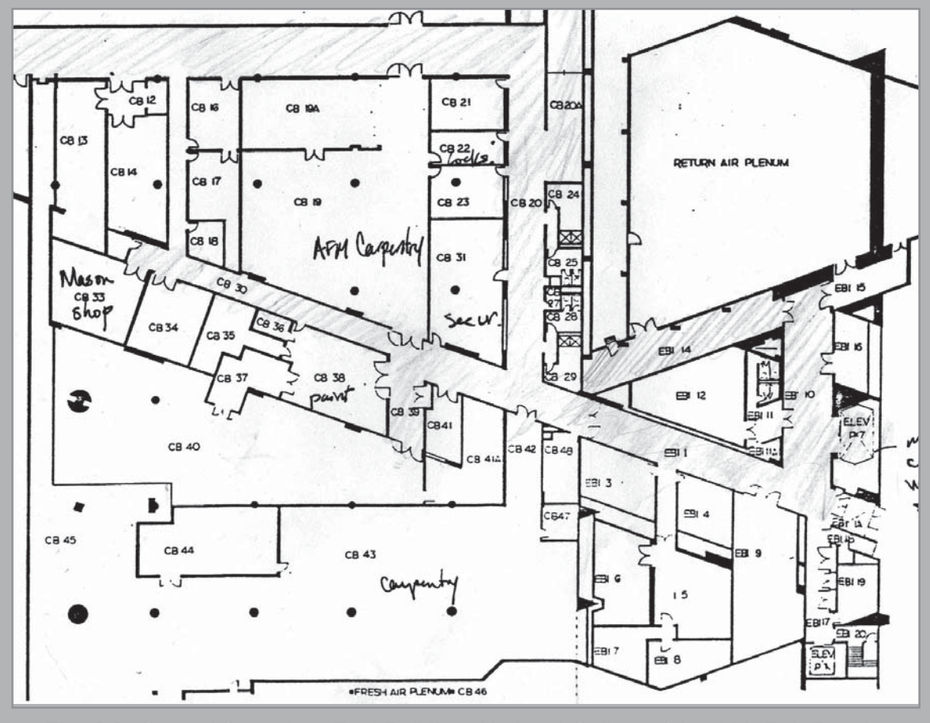


Fig. 2.8 Ground floor plan, East Building, National Gallery of Art, I.M. Pei. Drawing obtained from office of exhibits, NGA.

A small museum, the Pre-Colombian gallery by Philip Johnson at Dumbarton Oaks has a classical feel . The eight tiny glass pavilions surrounding a central circle at Dumbarton, contain usable space, while the center circle is the void. The use of the circle, and the repetition of the circle, lend the building a classical feel, e.g. the building is a symetrical entity that references itself, and its plan extends from a single point. E.L. Boulee's project for a museum makes and interesting classical comparison.

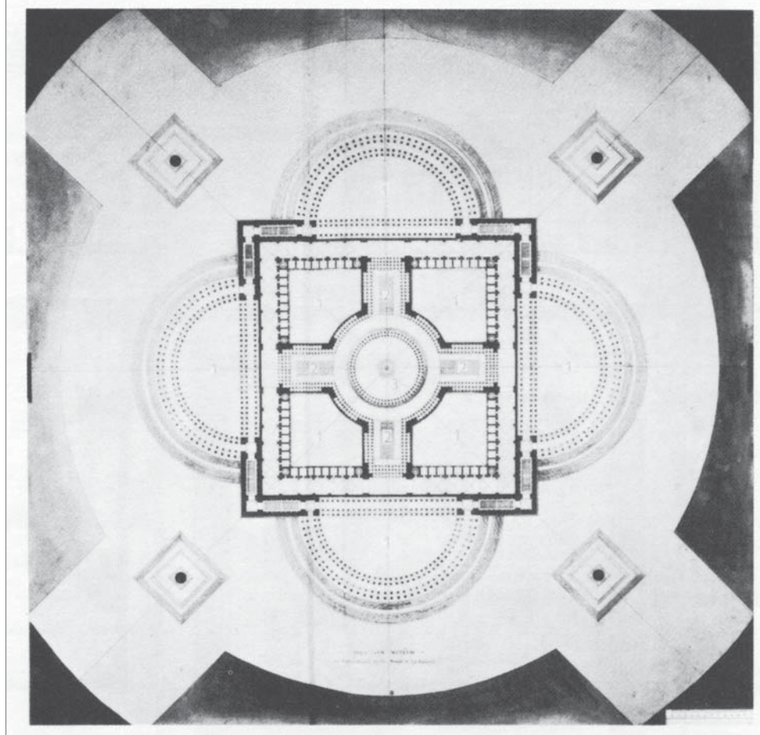


Fig. 2.9 Plan, project for a museum, 1783, E.L. Boullee. Searling, Helen, New American Art Museums, 1982, 15.

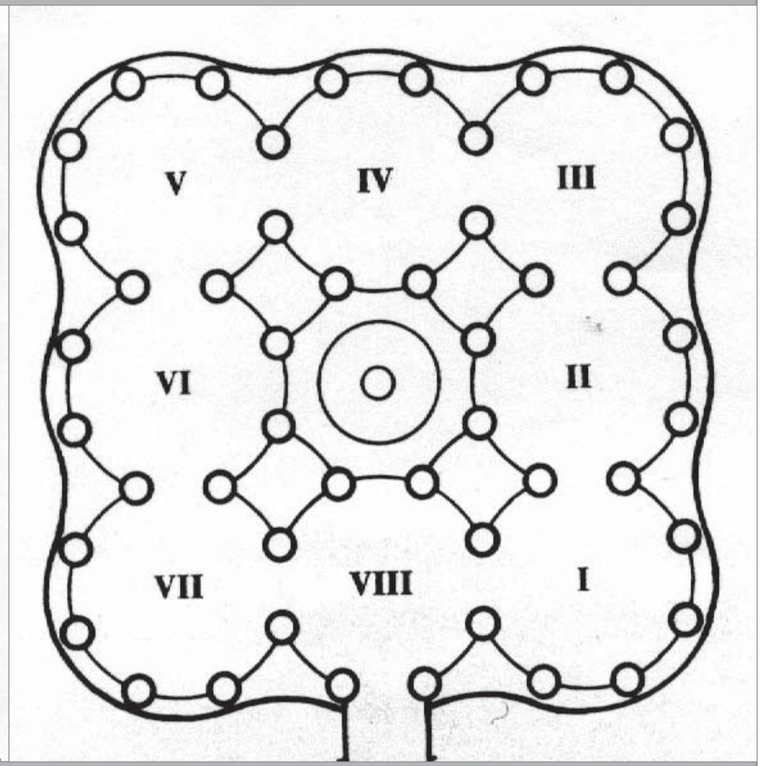


Fig. 2.10 Plan, Museum of Pre-Columbian Art, Dumbarton Oaks, 1963, Philip Johnson. *Museum Guide.*

If time is not linear, is the path linear?
M. McDonald

The Museum of the Moving Image, as a case study, is instructive of what an interactive museum can provide. Organized chronologically and by medium, the museum allows visitors to edit sound effects and film clips, as well as view displays and watch movies. As much fun as it is, the disadvantage of the interactive exhibit is that few people can experience it at a time-- and moving parts also mean broken parts, making maintainence critical.

The museum was without natural light-- a black box, where all light was added.

Fig. 2.12 Entry, American Museum of the Moving Image, New York, *Visitor Guide.*

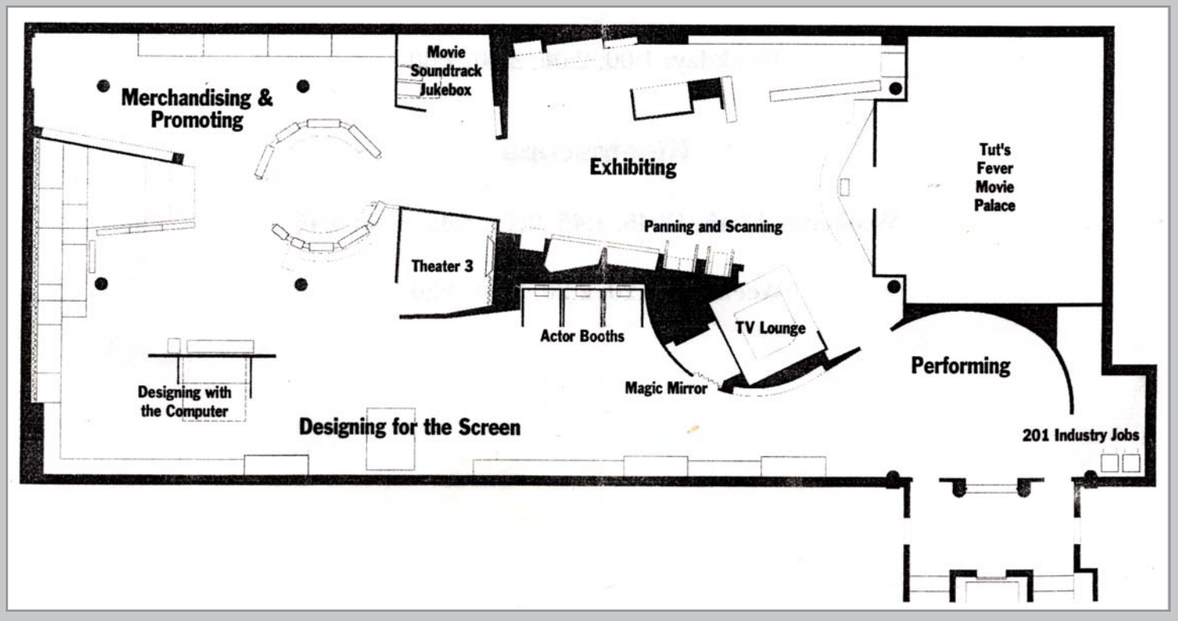


Fig. 2.11 Second floor plan, American Museum of the Moving Image, New York, *Visitor Guide, 1997*

Buildings visited in Washington, D.C.:

Corcoran Gallery of Art
Dumbarton Oaks- Robert Woods Bliss Collection of Pre-Columbian Art
Hillwood Museum
National Gallery of Art
National Portrait Gallery
Newseum
Phillips Collection
Renwick Gallery
Smithsonian Institution Arthur M. Sackler Gallery
Smithsonian Institution Museum Support Center
Smithsonian Institution National Museum of African Art
Smithsonian Institution National Museum of American Art
Smithsonian Institution National Museum of American History

Fig. 2.14 South elevation, National Gallery of Art West Building, *Brief Guide and Plan.*

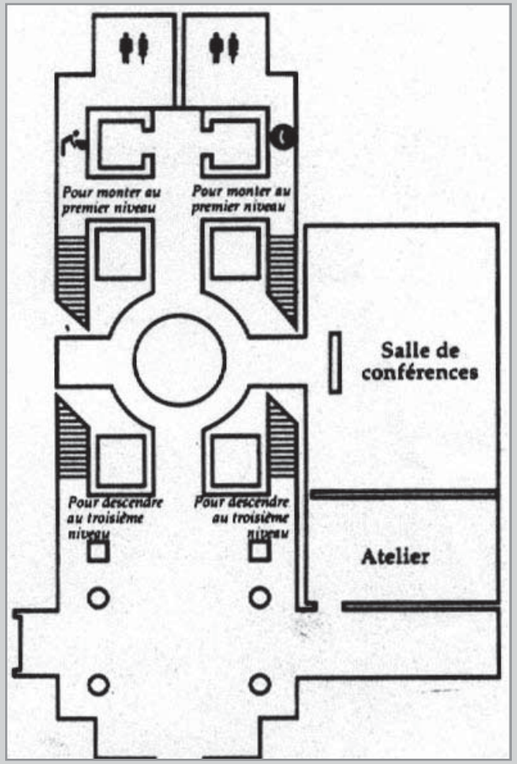


Fig. 2.13 Second level, Smithsonian Institution National Museum of African Art, *Visitors Guide*.

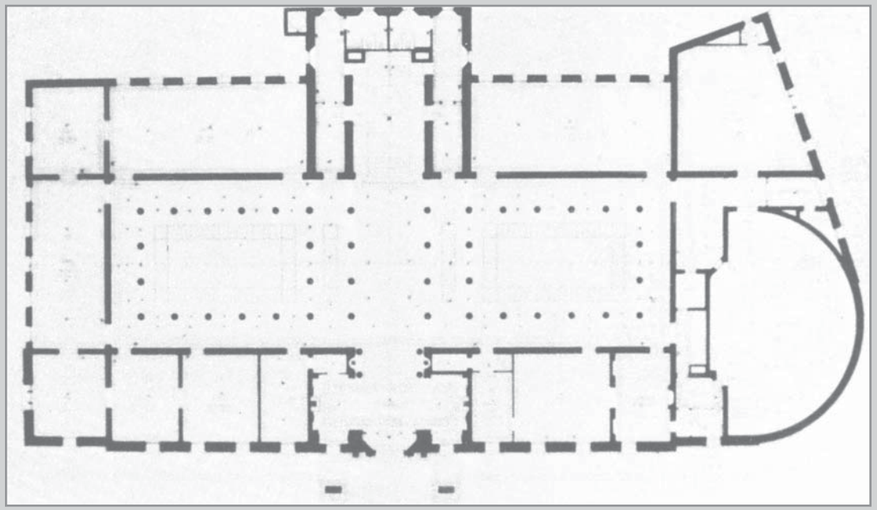


Fig. 2.15 Plan of first floor, Corcoran Galllery of Art. Searling, Helen, *New American Art Museums*, 1982, 37.

Buildings visited outside of Washington, D.C.

American Museum of the Moving Image, Astoria, N.Y.
Dallas Museum of Art, Dallas, Texas
High Museum of Art, Atlanta, Georgia
International Center of Photography, New York, N.Y.
Kimbell Art Museum, Fort Worth, Texas
Louvre, Paris, France
The Menil Collection, Houston, Texas
Musee d'Orsay, Paris, France
Musee National d'Art Moderne Centre Georges Pompidou, Paris
Philadelphia Museum of Fine Arts, Philadelphia, Pennsylvania
Museum of Fine Arts, Houston, Texas
Rock and Roll Hall of Fame, Cleveland, Ohio
Solomon R. Guggenheim Museum, New York, N.Y.
Virginia Museum of Fine Arts, Richmond, Virginia
Wolfsonian Museum, Miami Beach, Florida

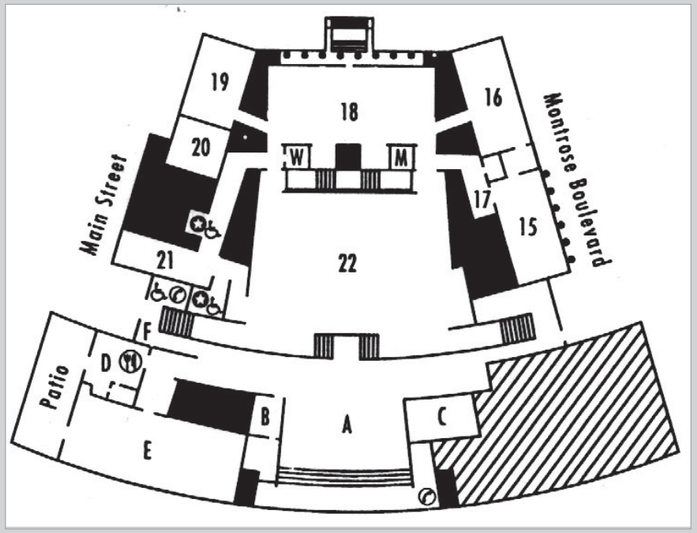


Fig. 2.16 Level 1 and ground floor plan, Museum of Fire Arts, Houston, *Visitors Map & Guide*.

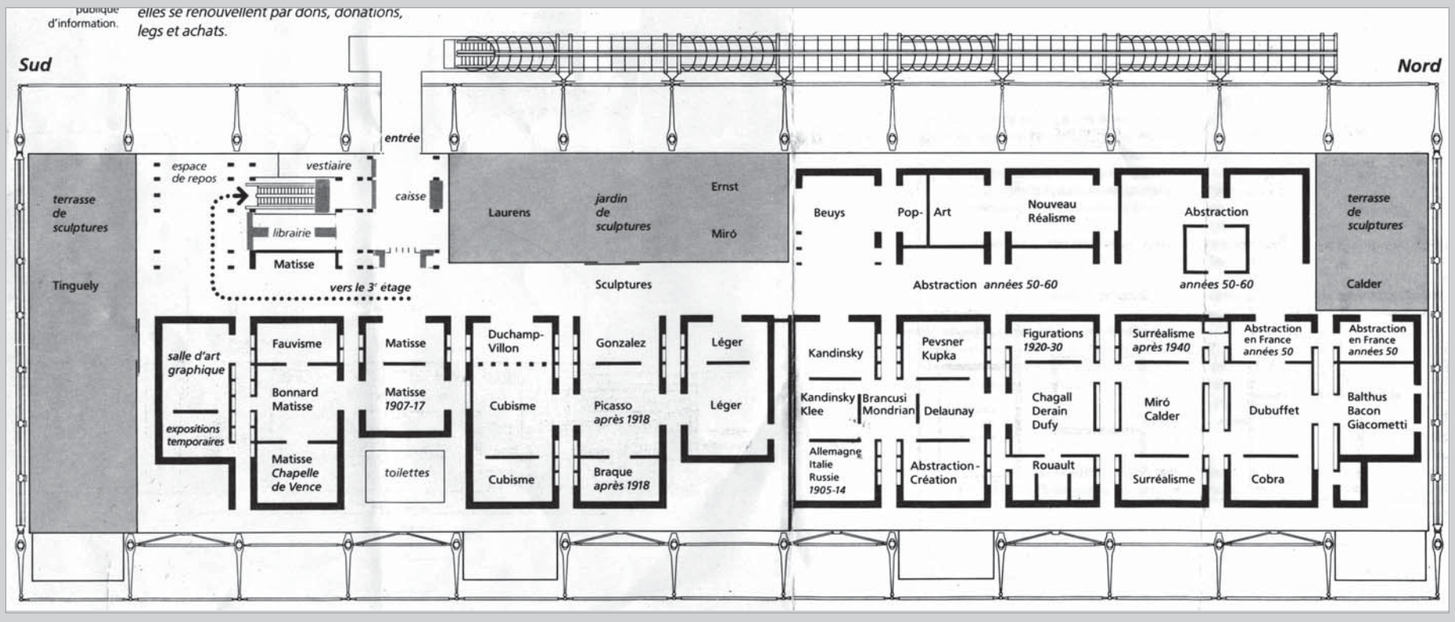


Fig. 2.17 Fourth floor, Musee national d'art moderne, Centre Georges Pompidou, Piano and Rogers/Richard Rogers Partnership, *Museum Guide*.

FUNCTIONAL PROGRAMMING FOR THE MUSEUM

The functional programming for the museum gave life to the idea of the museum. By defining the different user groups, their functions, and how those functions could be expressed in architecture, the form of the museum evolved. By studying the functional and economic models of modern museums in the western world, ratios for determining square footage were used. This was an important step in learning to build a museum that would be financially and scientifically sustainable.

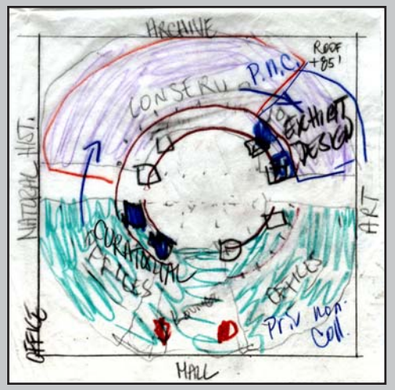
The experience of working in museums helped to understand the overwhelming complexity of the parts, as they related to the whole of the museum. Two aspects seem especially relevant: understanding the role of the museum mission in the allocation of space and understanding the relationship between the public and private aspects of a museum. A museum's mission is the basis for the scale and types of spaces that will be built. Visiting many museums helps understand them as a building type.

The thesis is to provide a national museum in Washington, D.C., to research, house, educate, and display examples of the use of film and photography as methods of expression and of documentation. The moving films and still photographs tell the human story. The museum is for the objects and films, and for recording, exploring, expressing, and telling their story to others.

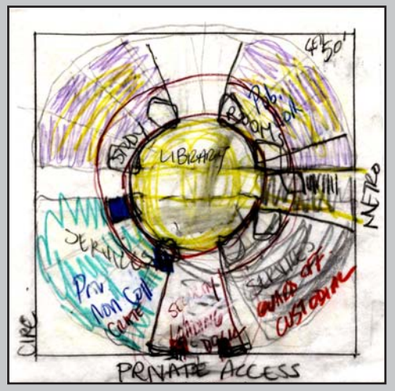
The challenge of programming was to provide for all of the basic functions, leaving flexibility in the plan.

Each choice leads to the next. That is what makes a path.

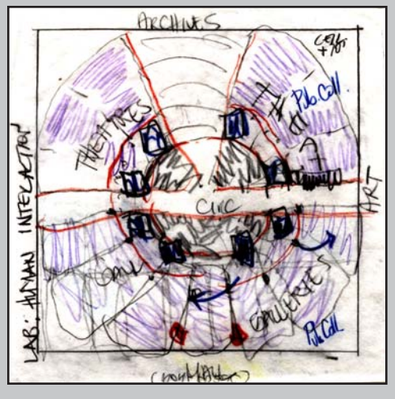
M. McDonald



Archive Level Functions



Staff Level Functions



Entry Level Functions

Because of the scale of the building, I chose a form that would allow one to become physically and conceptually oriented from its main entrance. The use of linear skylights was employed to help in orientation. I also wanted to provide for exhibitions and films of different length and audience size. The public areas would include short- and long-term exhibitions, feature length films for a variety of group sizes, individual viewing, and study collections for private, supervised research.

Programming for the museum brought clarity and order to the thousands of impressions and bits of information included in a building of this scale. It became more of an organism than an “object” on the mall. All of its sequences and relationships participated in its function. To make it beautiful, and not wasteful, I strove to provide no more and no less than it needed and to impose myself only in the expression of the functions. Jaan Holt said that everything about a dog contributes to its function. This taught me that nature can provide examples for designers to follow.

The Artifact’s Life
Arrival at Shipping and Receiving
Conservation Lab
Preparation for Exhibition
Exhibition
Research
Storage
Loan
De-accession (sometimes)

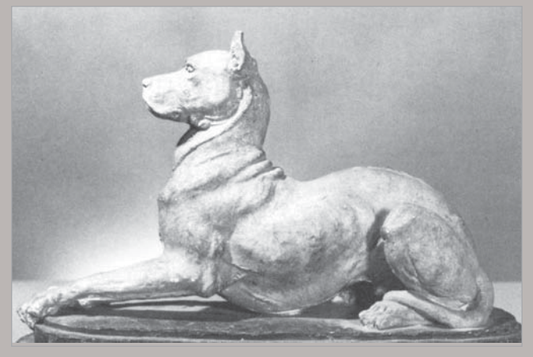


Fig. 3.1 Model for National Archives South pediment figure by Bruce Moore. Architecture, Design and Engineering Collections, Prints and Photographs Division, Library of Congress.

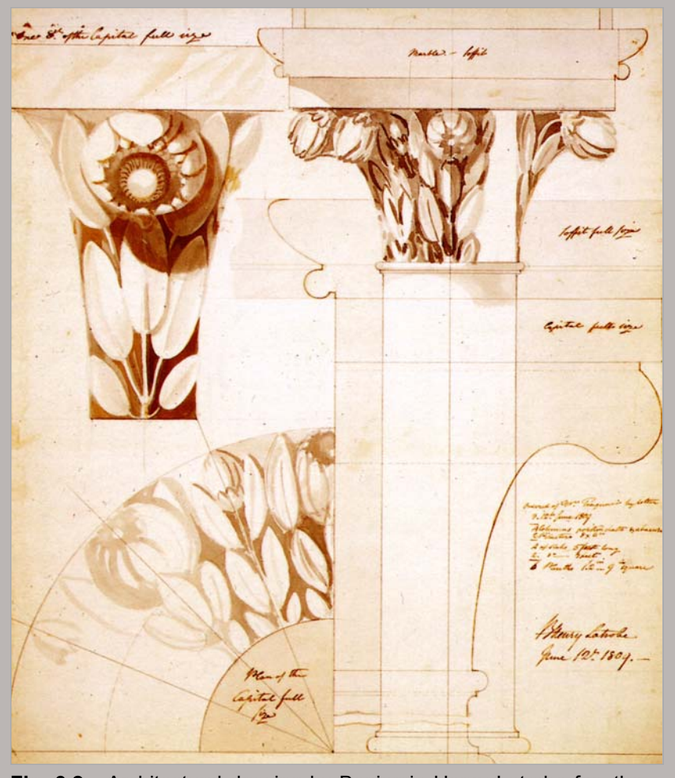


Fig. 3.2 Architectural drawing by Benjamin Henry Latrobe for the Senate Chamber, U.S. Capitol, depicting the American Magnolia tree. Ink and watercolor, 1809. Architecture, Design and Engineering Collections, Prints and Photographs Division, Library of Congress.

Program for the National Museum of Film and Photography

The Manual of Museum Planning recommended a shift in programming toward more space for public collections. I chose the following more sustainable model:

Public Collection	**50%**	(typically 37% in the U.S.)
Public Non-Collection	**25%**	(typically 25% in the U.S.)
Private Collection	**10%**	(typically 18% in the U.S.)
Private Non-Collection	**15%**	(typically 20% in the U.S.)

These would include:

Public Collection- 100,000 square feet:
Auditoria, Temporary Galleries, Permanent Galleries, Circulation Space, Public Study and Research Rooms, Publicly Accessible Archives, Growth Space (100,000 square feet)

Public Non-Collection- 50,000 square feet:
Parking and Transportation, Entry, Restrooms and Coat Check, Main Hall, Museum Shop, Public Information Services, Library, Study Rooms, Restaurants and Food Concessions

Private Collection- 20,000 square feet:
Private Archives, Loading Dock, Crating and Shipping, Curatorial, Conservation, Exhibit Design, Exhibit Fabrication, Storage

Private Non-Collection- 30,000 square feet:
Staff Parking, Security, Personnel, Museum Programs, Custodial and Guard Lockers and Facilities, Director's Offices, Curators' Offices, Staff Offices, Lounges, Labs, Darkrooms, Film Viewing Rooms, Physical Plant and Maintenance Offices, Storage (General)

Fig. 3.3 Classroom in the David H. McAlpin Study Center of the Art Museum, Princeton University. Darragh, Joan, and James S. Snyder, *Museum Design Planning and Building for Art*, 1993, 88.

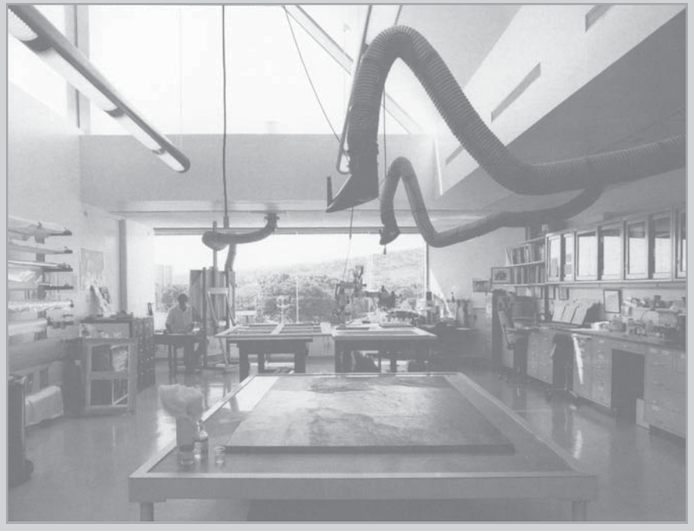
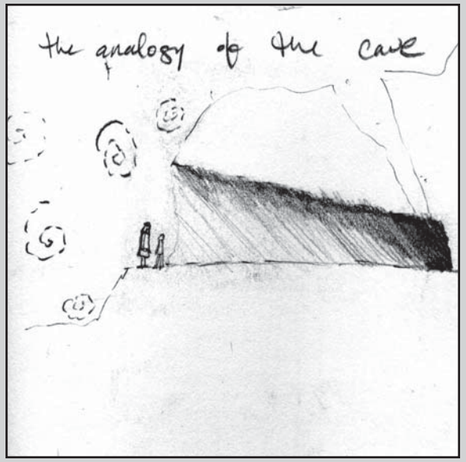


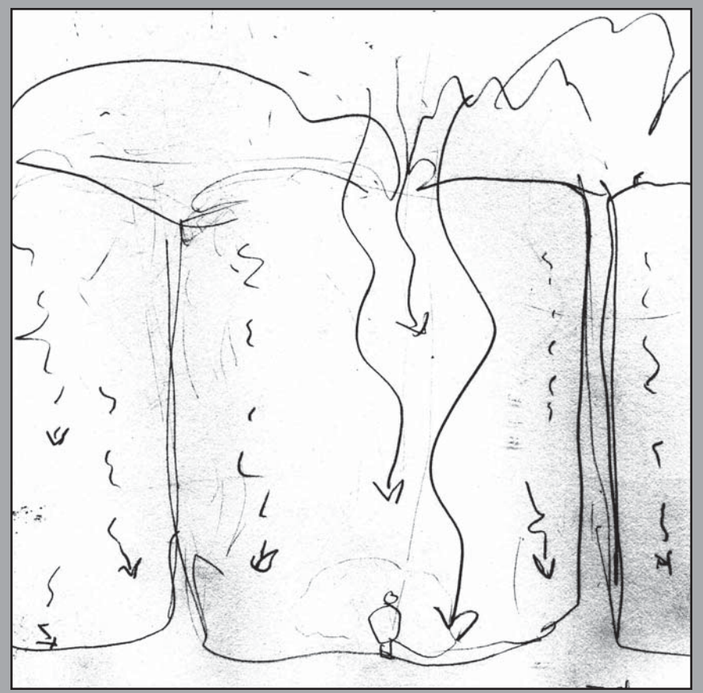
Fig. 3.4 Conservation lab, Bishop Museum, Honolulu, Hawaii. Darragh, Joan and James S. Snyder, *Museum Design, Planning and Building for Art*, 1993, 90.

THE SEARCH FOR FORM

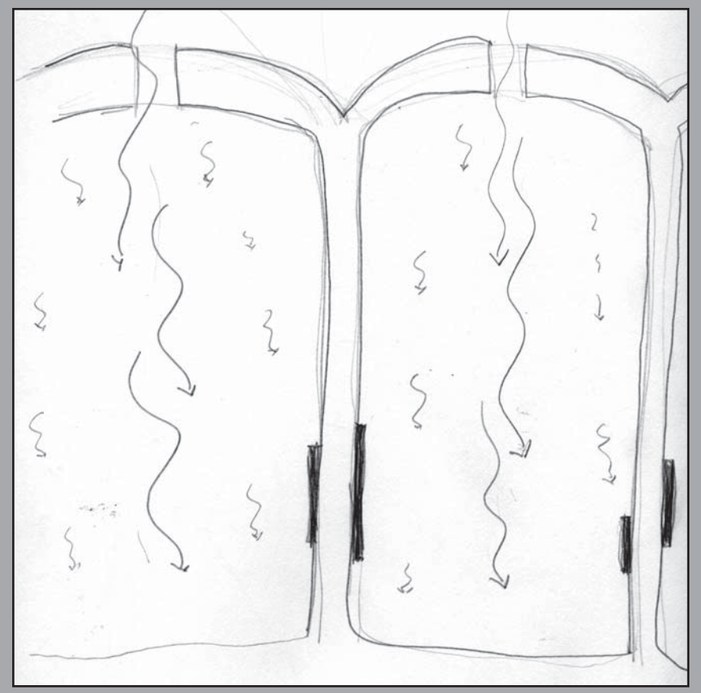
While thinking about the way that light falls through trees I began to wonder how the concept could be translated into architecture. As I made the two sketches below they made me think about two buildings: the Johnson Wax Building by Frank Lloyd Wright and the Kimbal Art Museum by Louis I. Kahn.



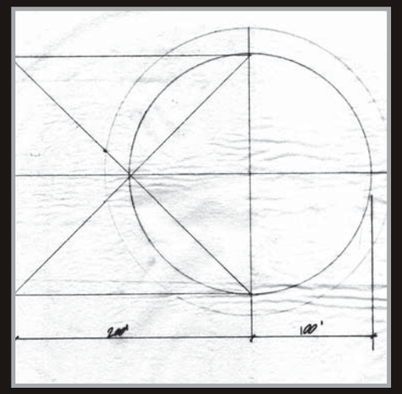
Light diminishes with distance from an opening



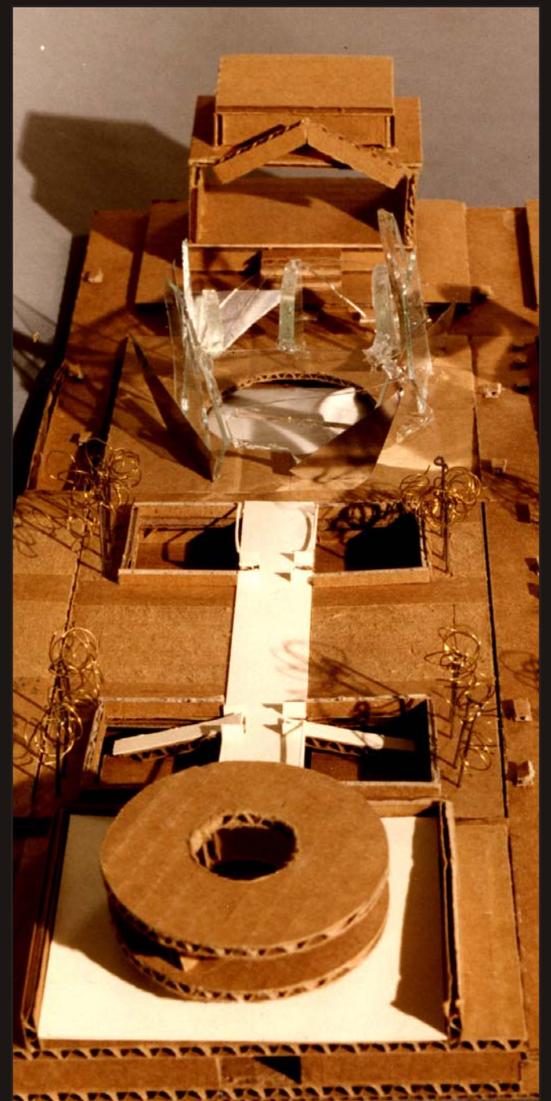
Le Foret, par Dieu



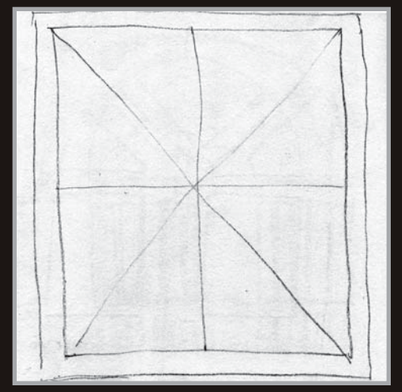
Architecture mimics nature



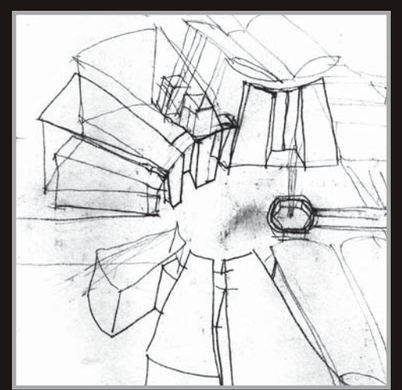
Concept of the warp.....

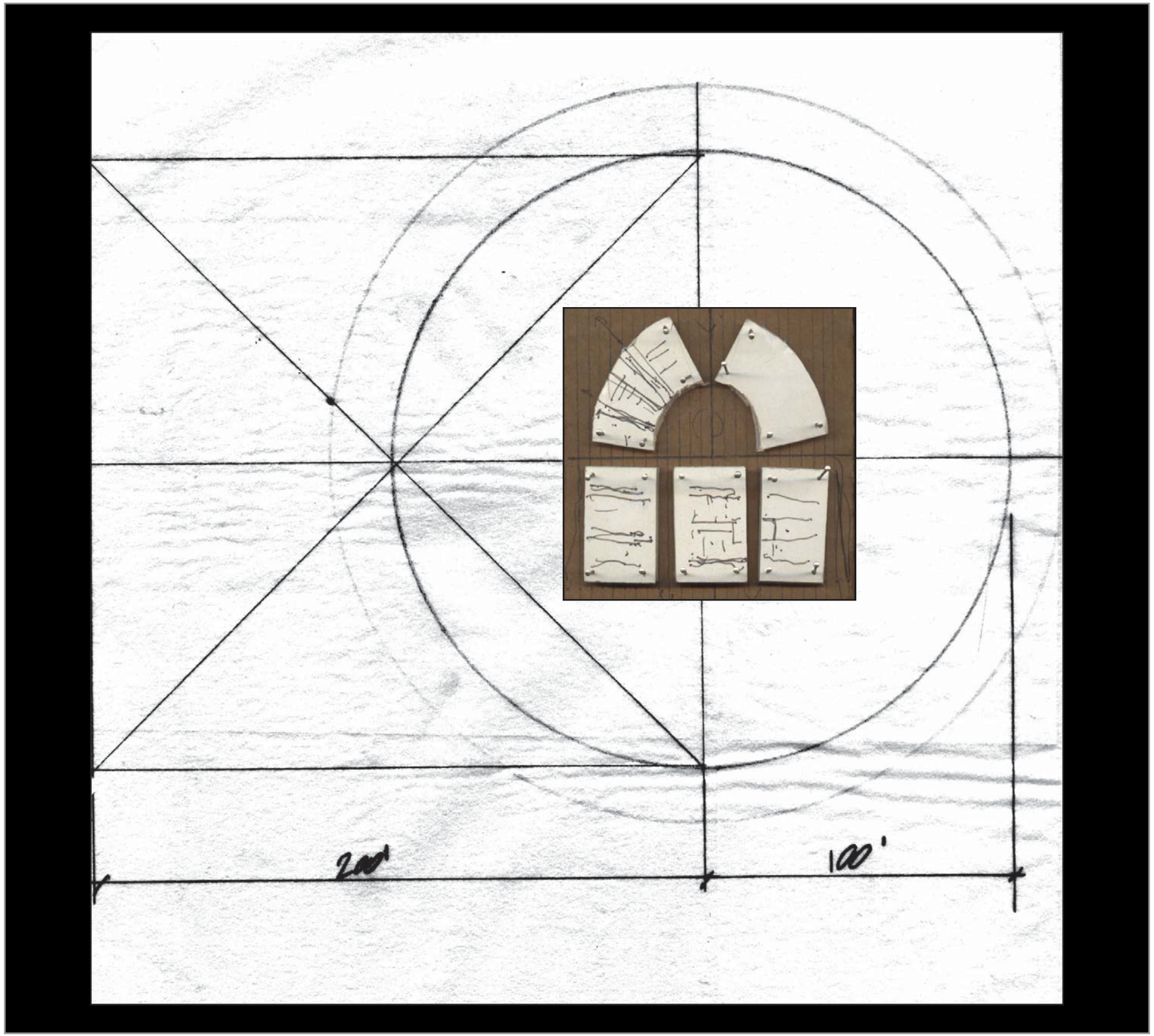


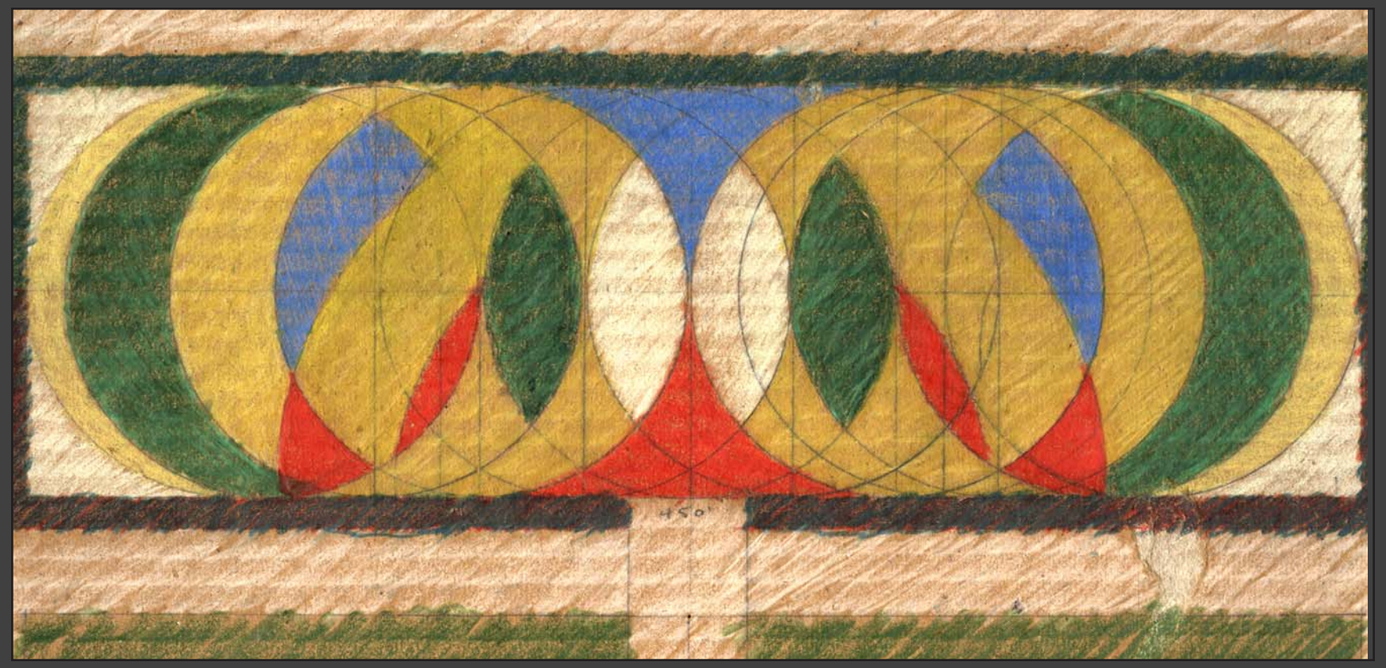
Concept for a transparent building on the site



.....and the woof

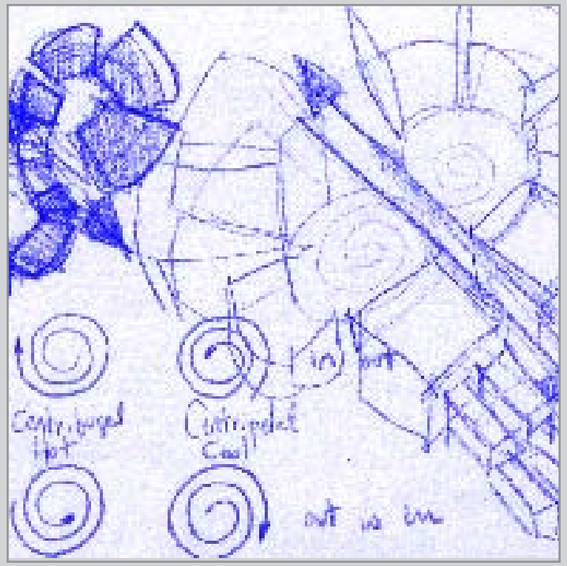



200'
100'

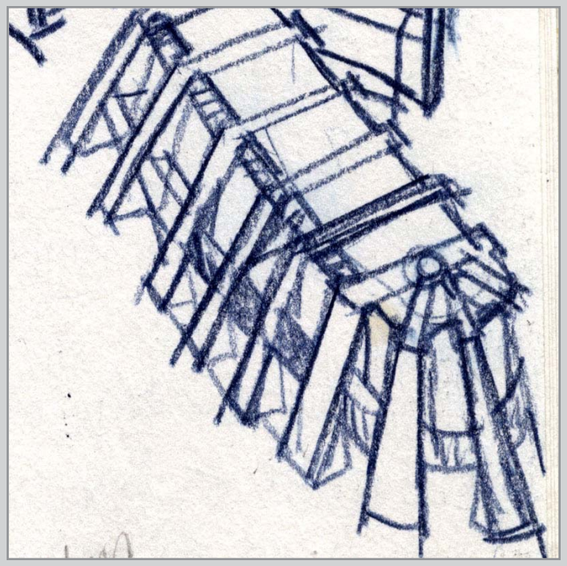


Geometry study of the site

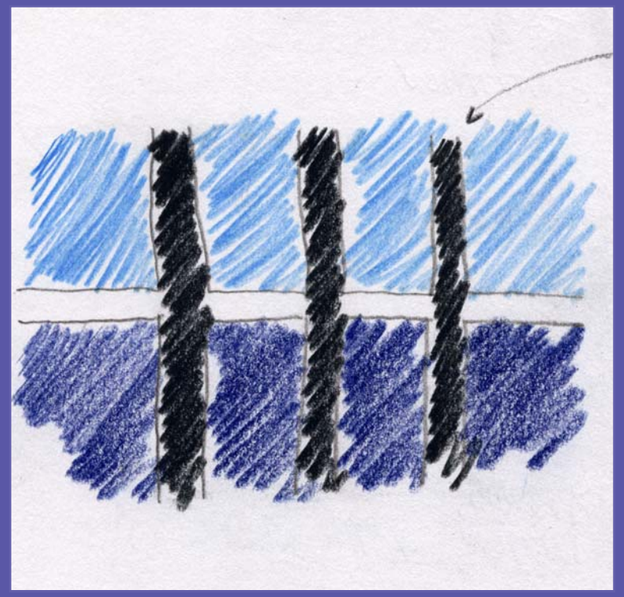
Geometry study of the site



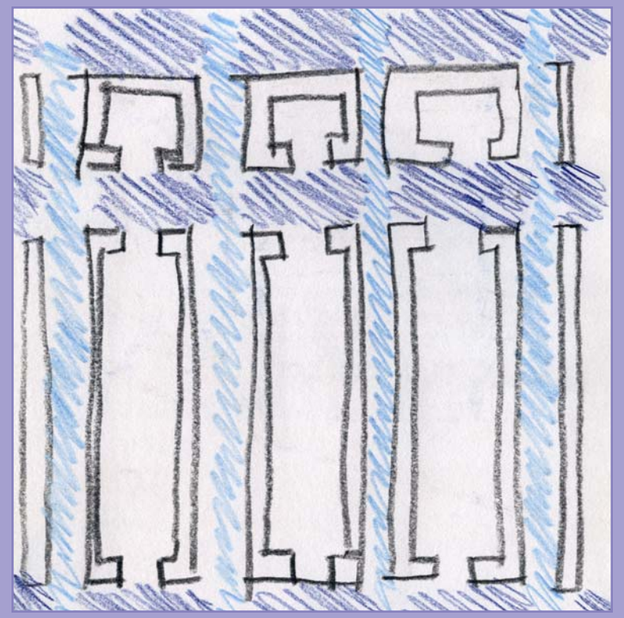
Study of site geometry and the forces implied by the geometry- the circle



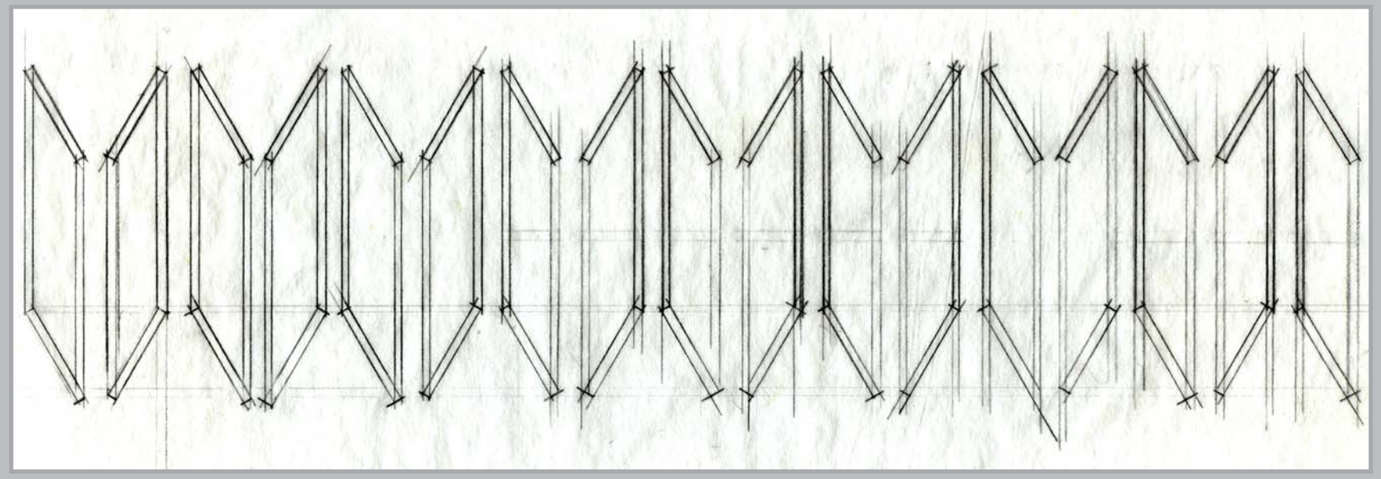
I looked at a linear shape



The two worlds of the museum...the public and the private

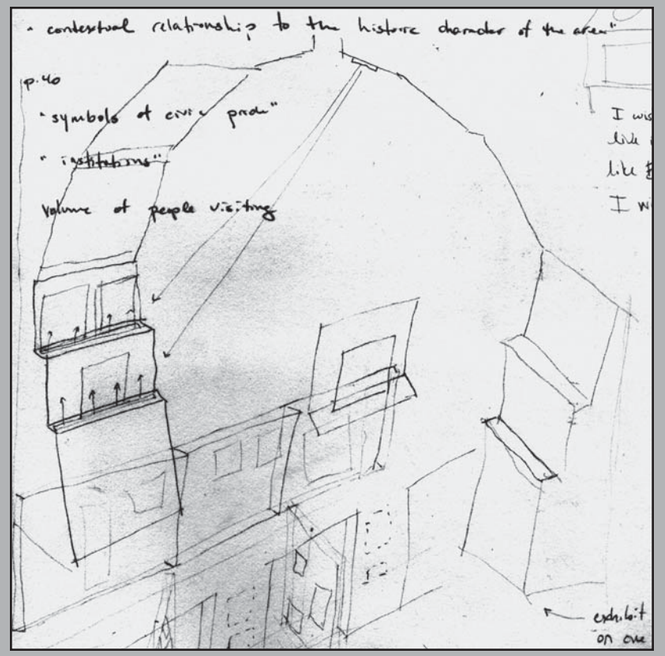


Each visitor chooses his or her own path. The museum is not an experience that is dictated. This museum is not a mausoleum to the done.

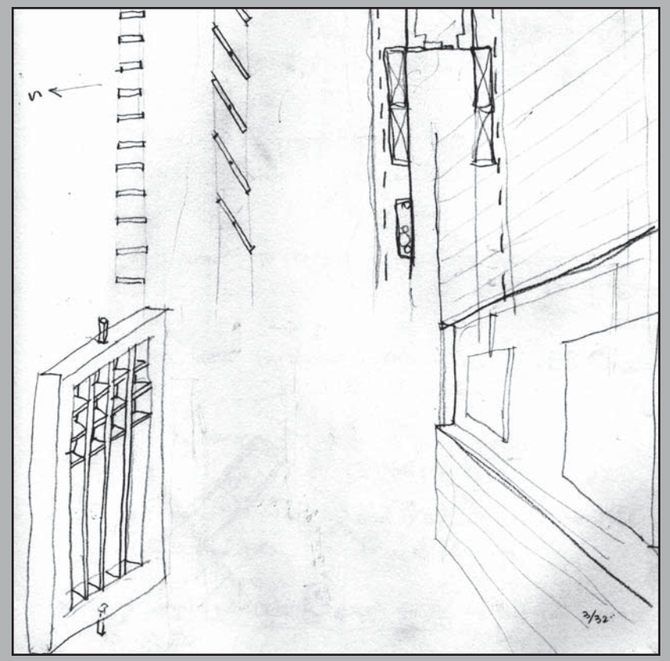


Light study for south elevation

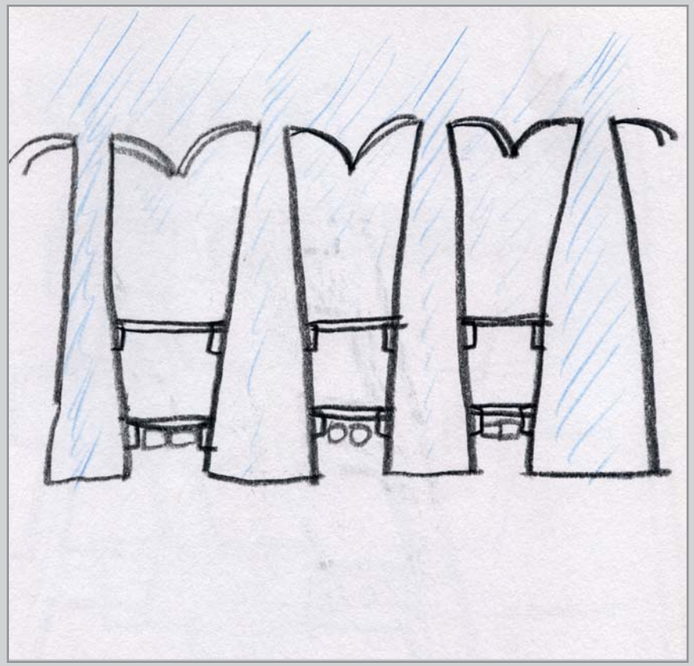
Light study for south elevation



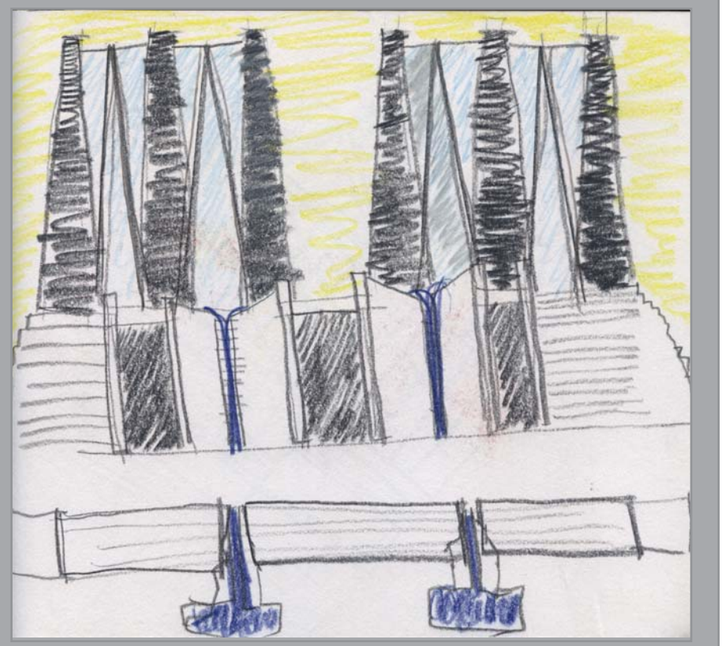
Study for a multi-level display wall



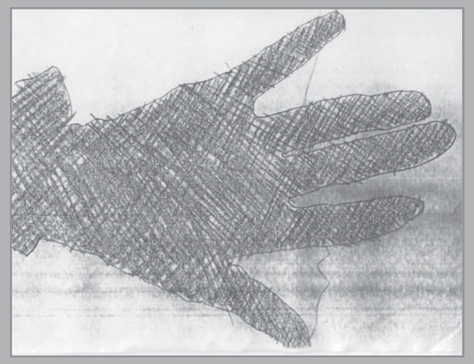
Study for a series of light-filtering screens along a gallery



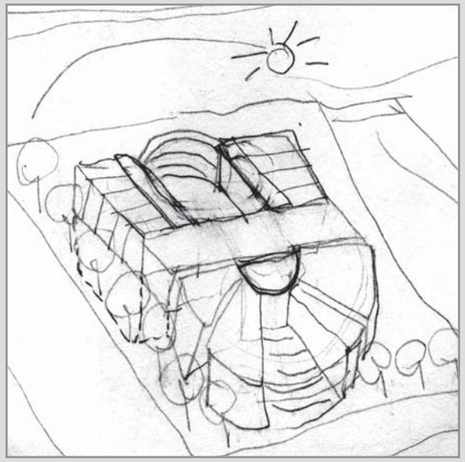
Dreaming about the building in section



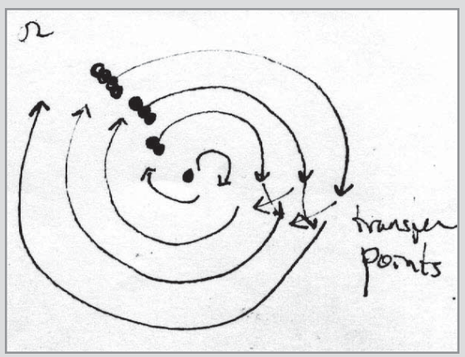
Thinking of restoring the Tiber Creek to the site as a fountain



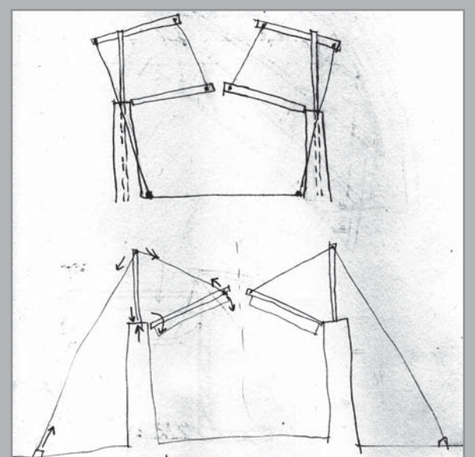
A photograph is like a shadow. It is also a moment in time.



The sun will pass above the gallery side, the theaters are on the north, where it is darker.



...the progress of an individual in a gallery, the moving, the stopping, and the changes in direction



Perhaps a drawbridge could serve as a model for an operable light filter.

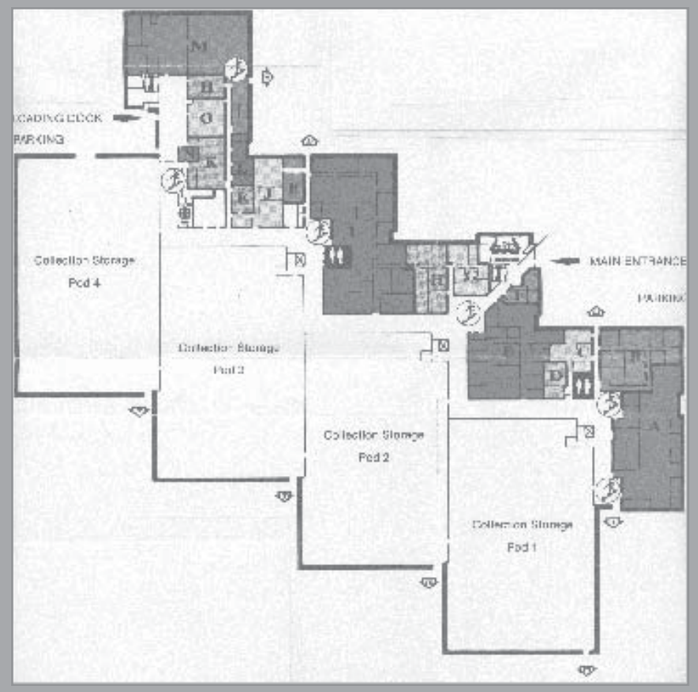


Fig. 4.1 Smithsonian Institution Museum Support Center, Suitland, Maryland. Plan taken from facilities CAD system.

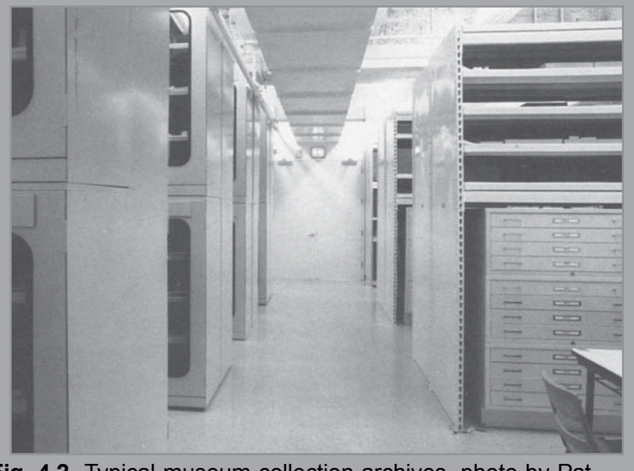
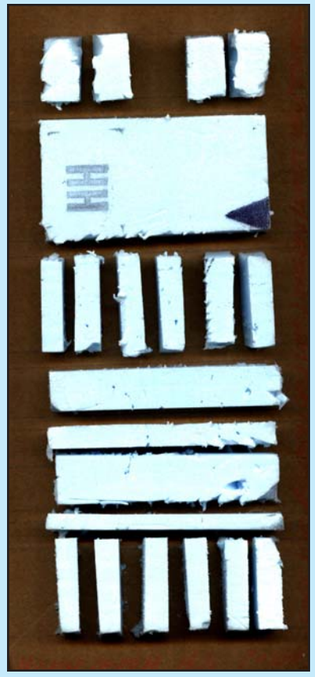
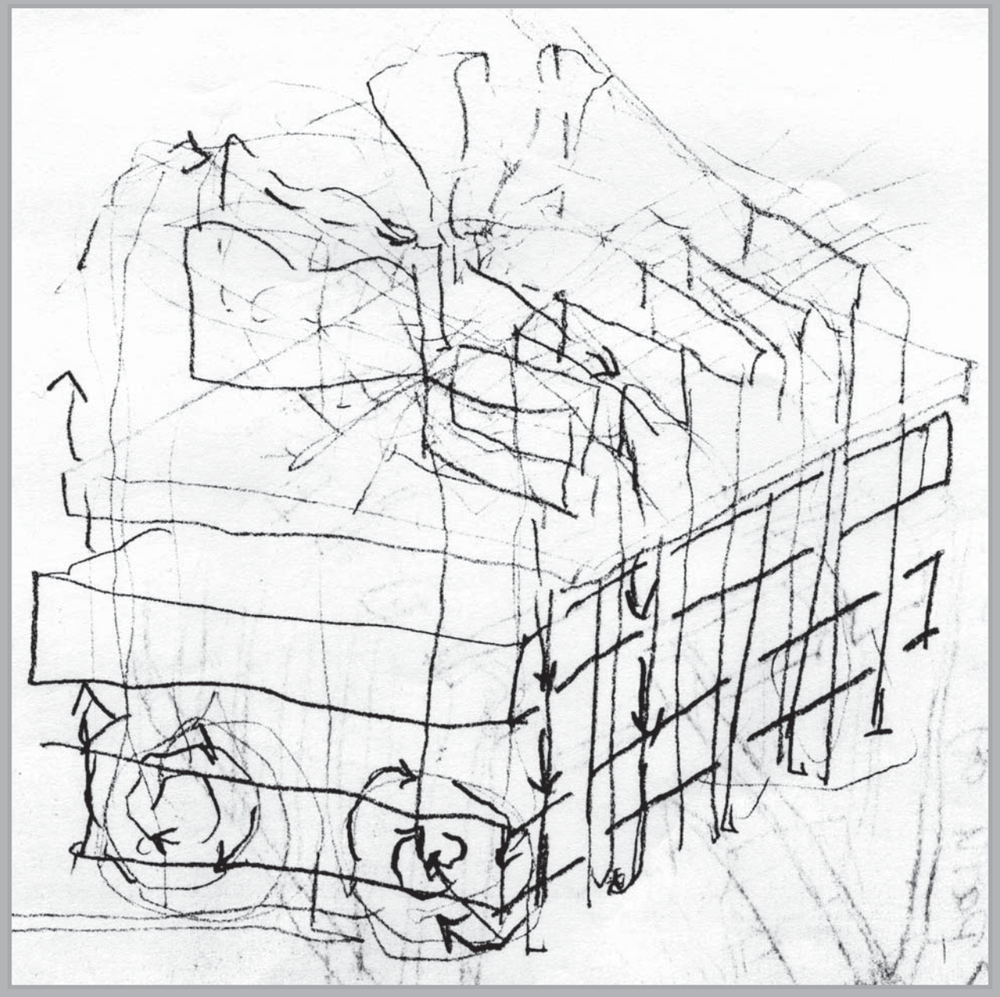


Fig. 4.2 Typical museum collection archives, photo by Pat Bazelon. Darragh, Joan and James S. Snyder, *Museum Design Planning and Building for Art,* 1993, 174.

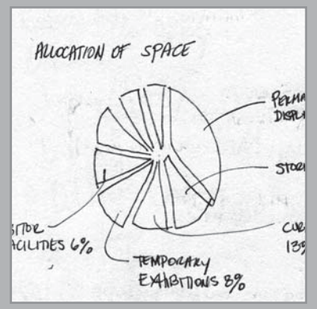
The Smithsonian Institution Museum Support Center is a freestanding example of the collections/staff side of a museum. By understanding the larger function of the collections side, one may better order the parts according to their relationships. In Fig. 4.1 the relationship of collection storage to conservators and curators may be seen. The corridor divides the collection, and provides the essential function of isolating the it from people, food, bacteria, insects, and impurities.



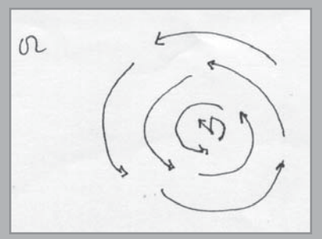
Diagrammatic model for the thesis of the relationships between the major parts of a museum



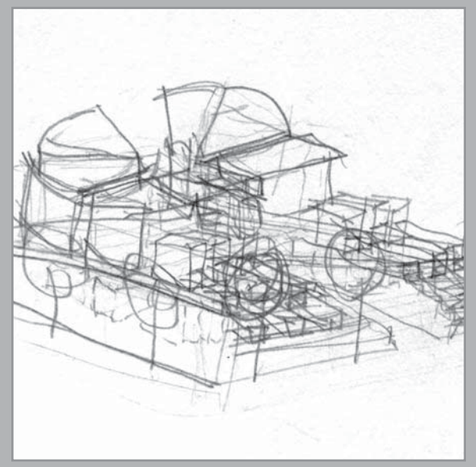
The functioning of a museum can be seen as a machine...



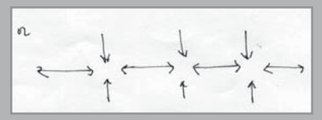
The percentage of space for each department



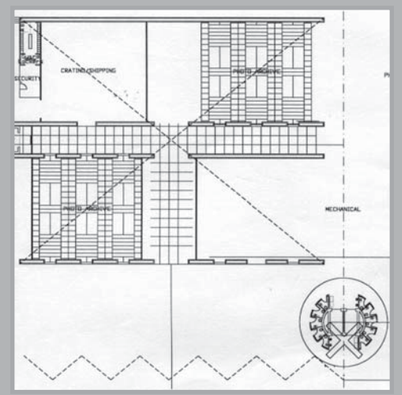
The circle is the gathering place. The line is the walking place.



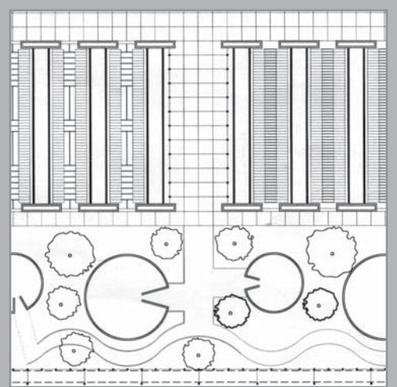
This sketch shows the theaters at the south side, allowing the line of the building to flow down the sloping site.



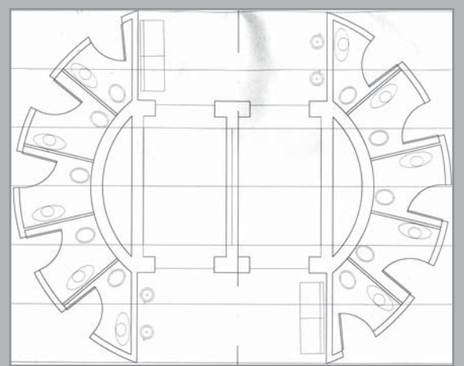
The gallery is a series of events.



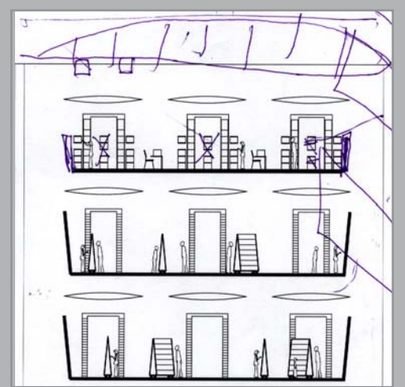
More studies of gallery levels



Study for small galleries on south side

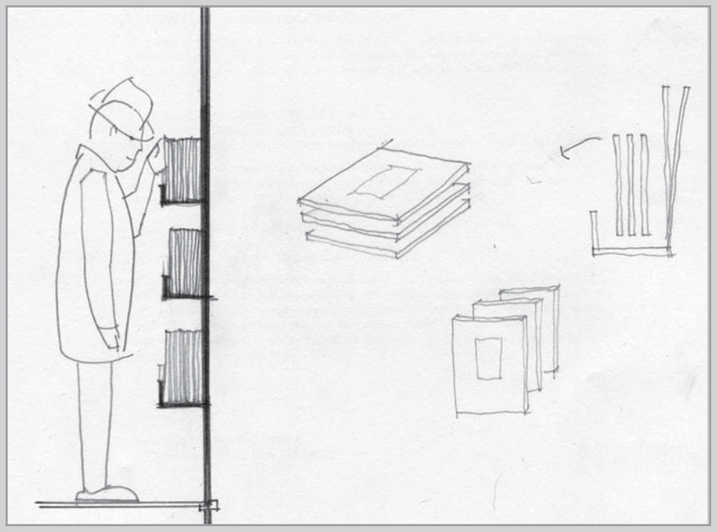


Study for restrooms in a core configuration

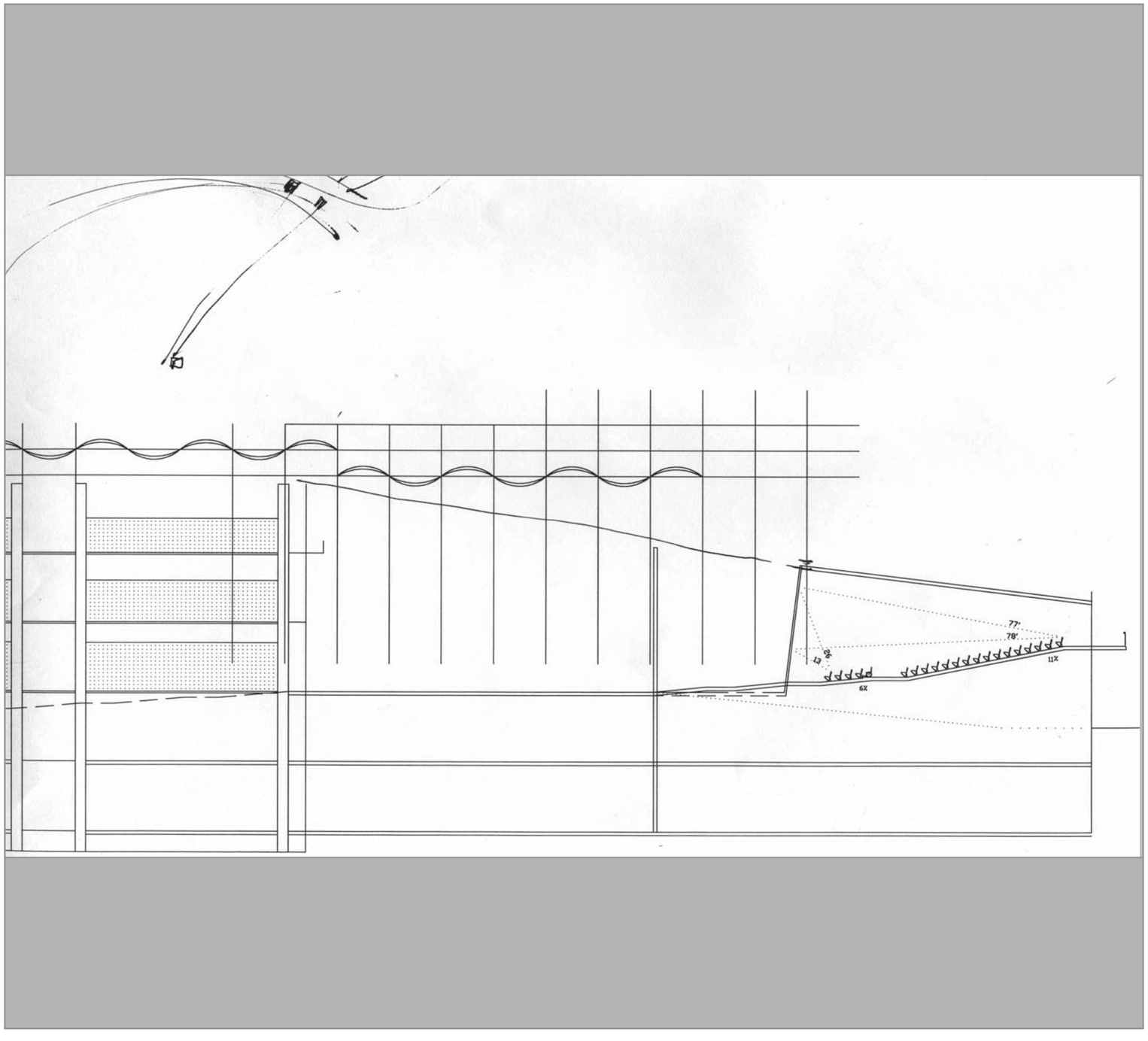


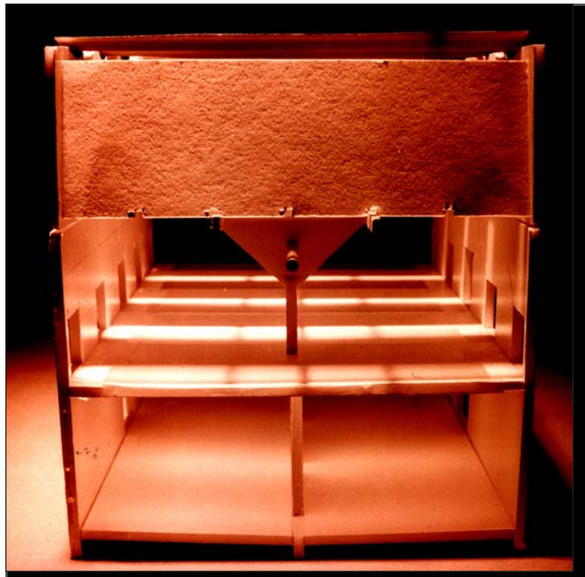
Study of bridges in section

The galleries become bridges that allow light to be filtered to lower levels.



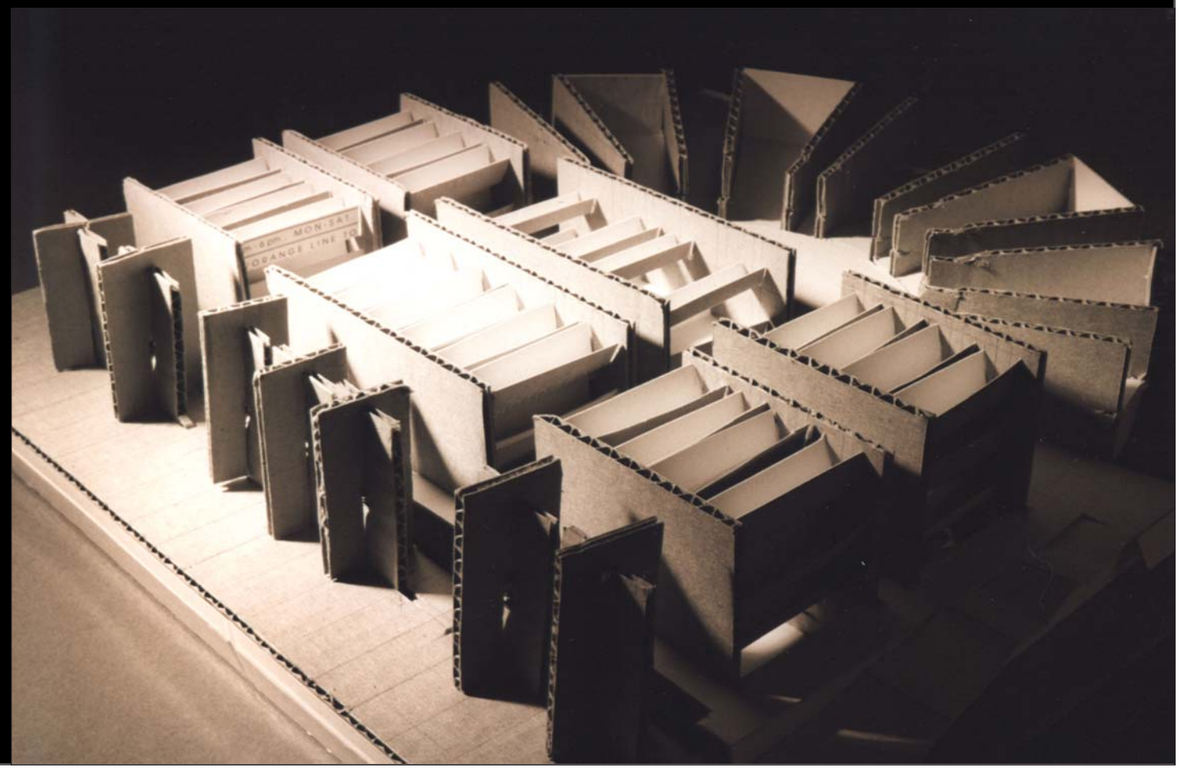
Make photographs available for public study.

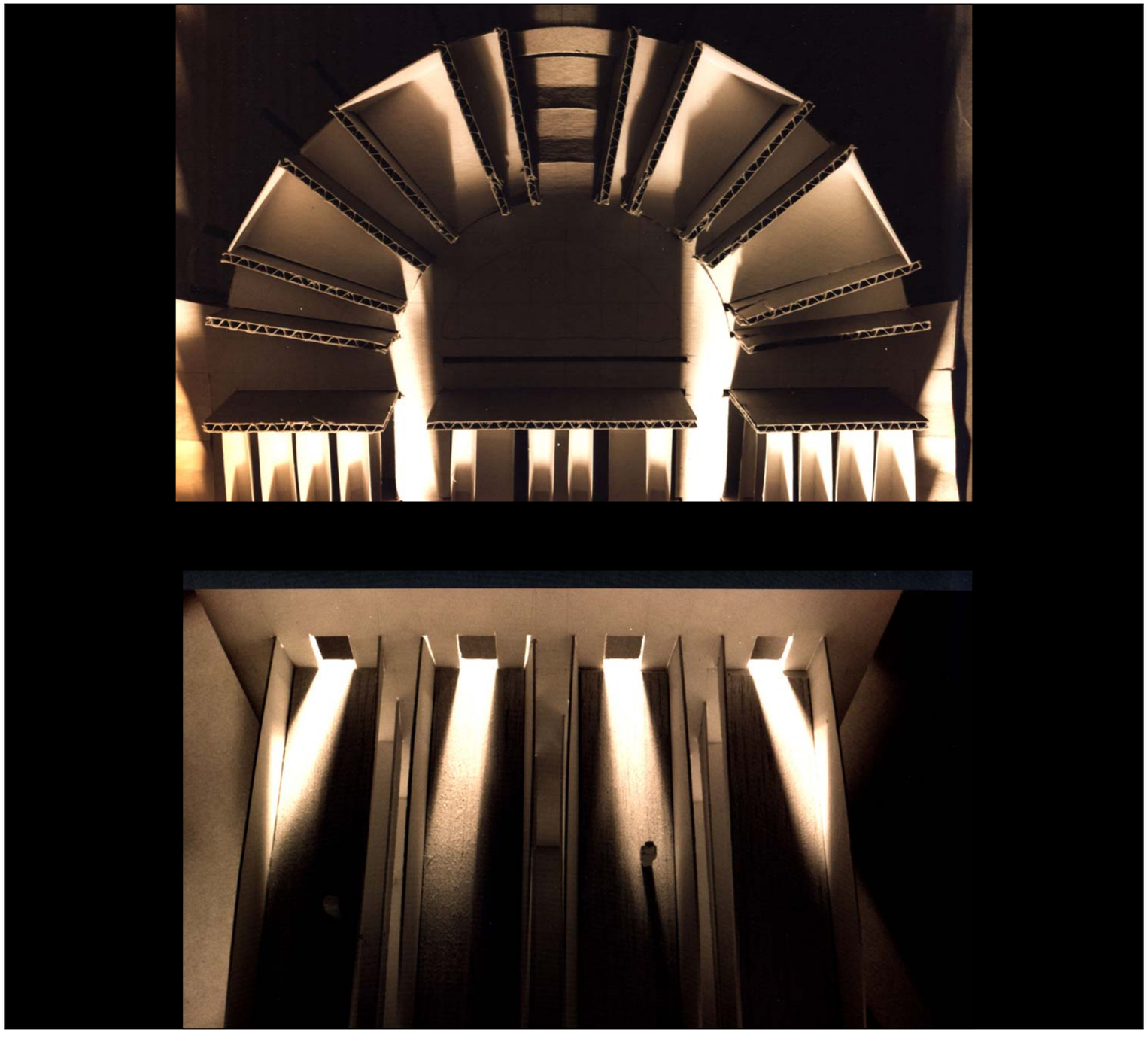

77'
78'
x11
x9

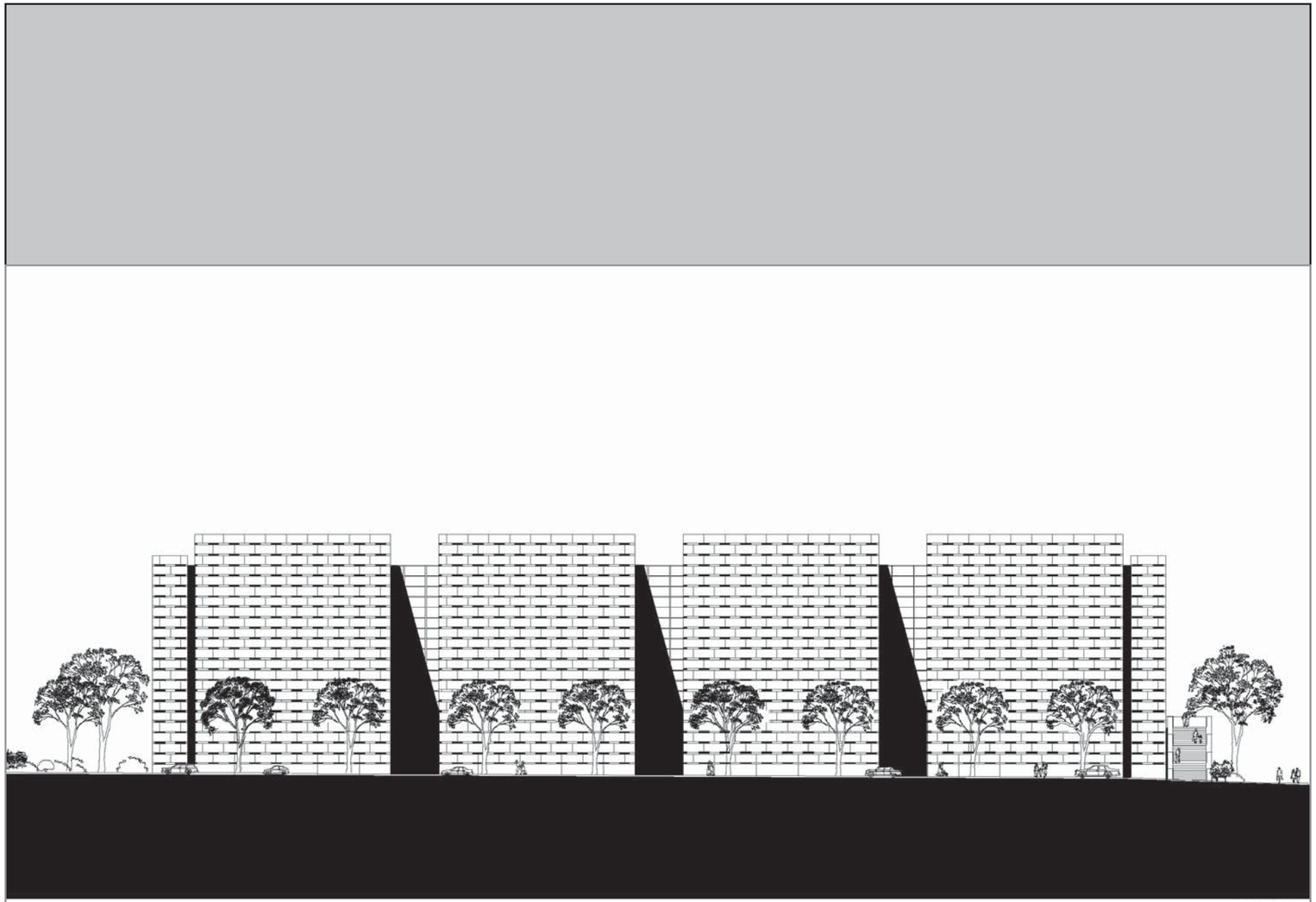


A model of three levels demonstrates the quality of light that will be present at the second and third levels down. A concrete floor with strips of glass block on the middle floor allow the light to continue penetrating the building.

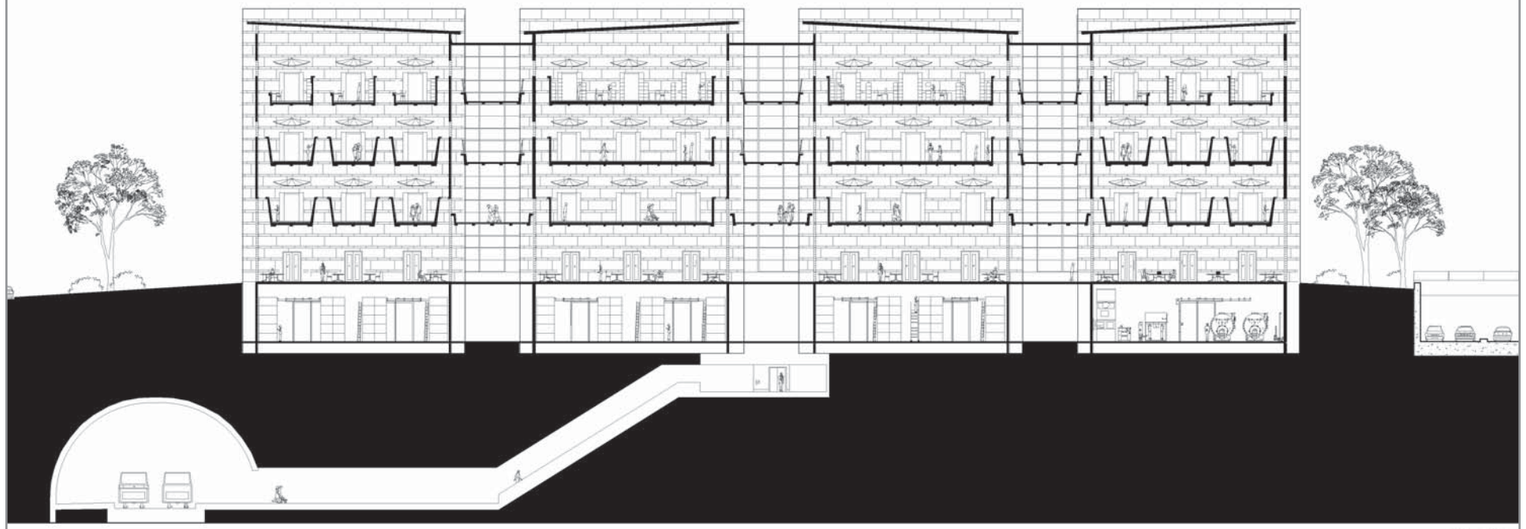
A model of the museum complex shows six concrete gallery towers composed of post-tensioned concrete bridges. The theaters to the north wrap around a central orientation place. The study towers on the south side were eliminated to create a study floor at a fourth level. This study floor, also configured in bridges, was added as I learned that protection of paper and other natural objects from too much natural light was necessary. The design allows the lower floors to still receive natural light, but in lower levels.



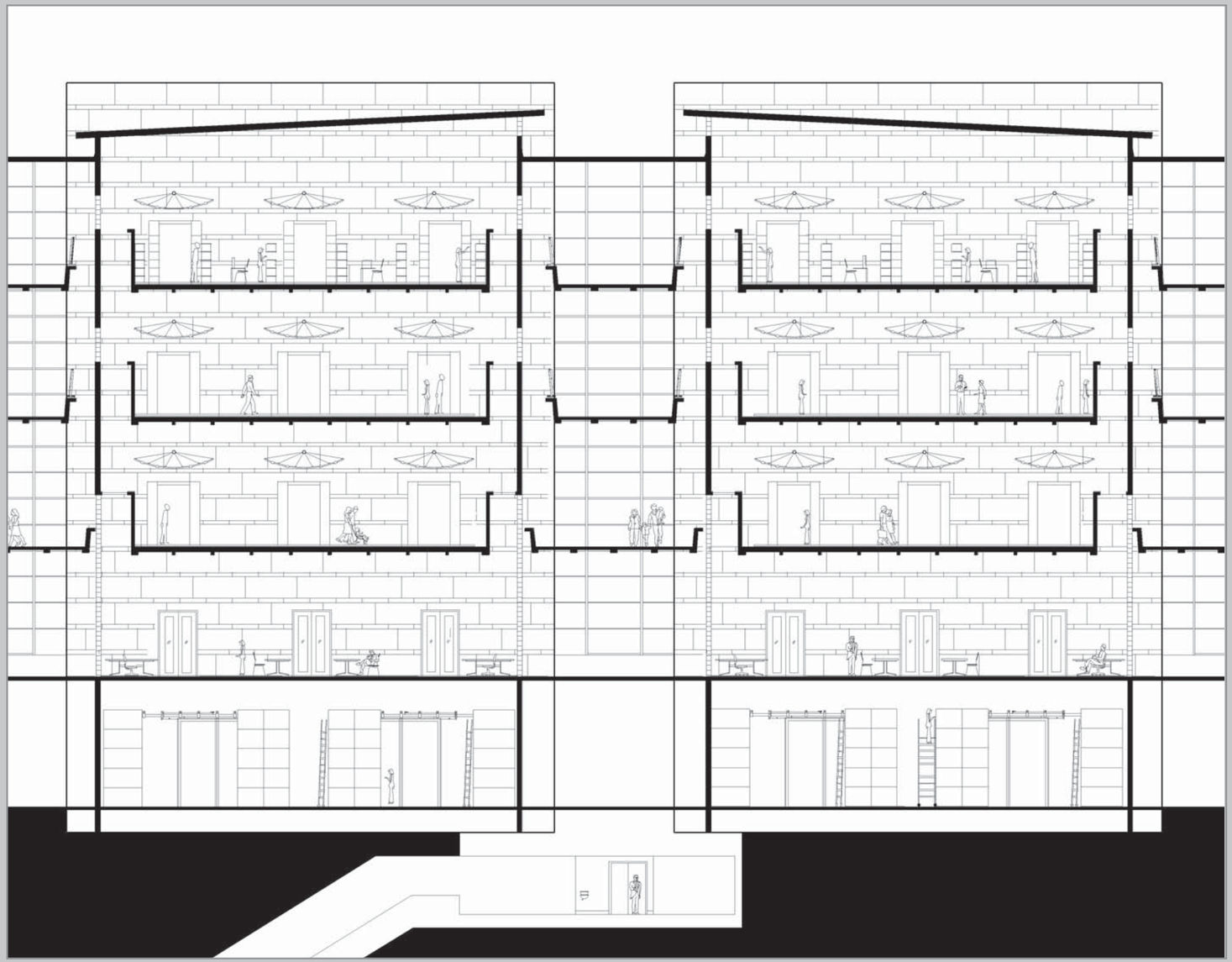


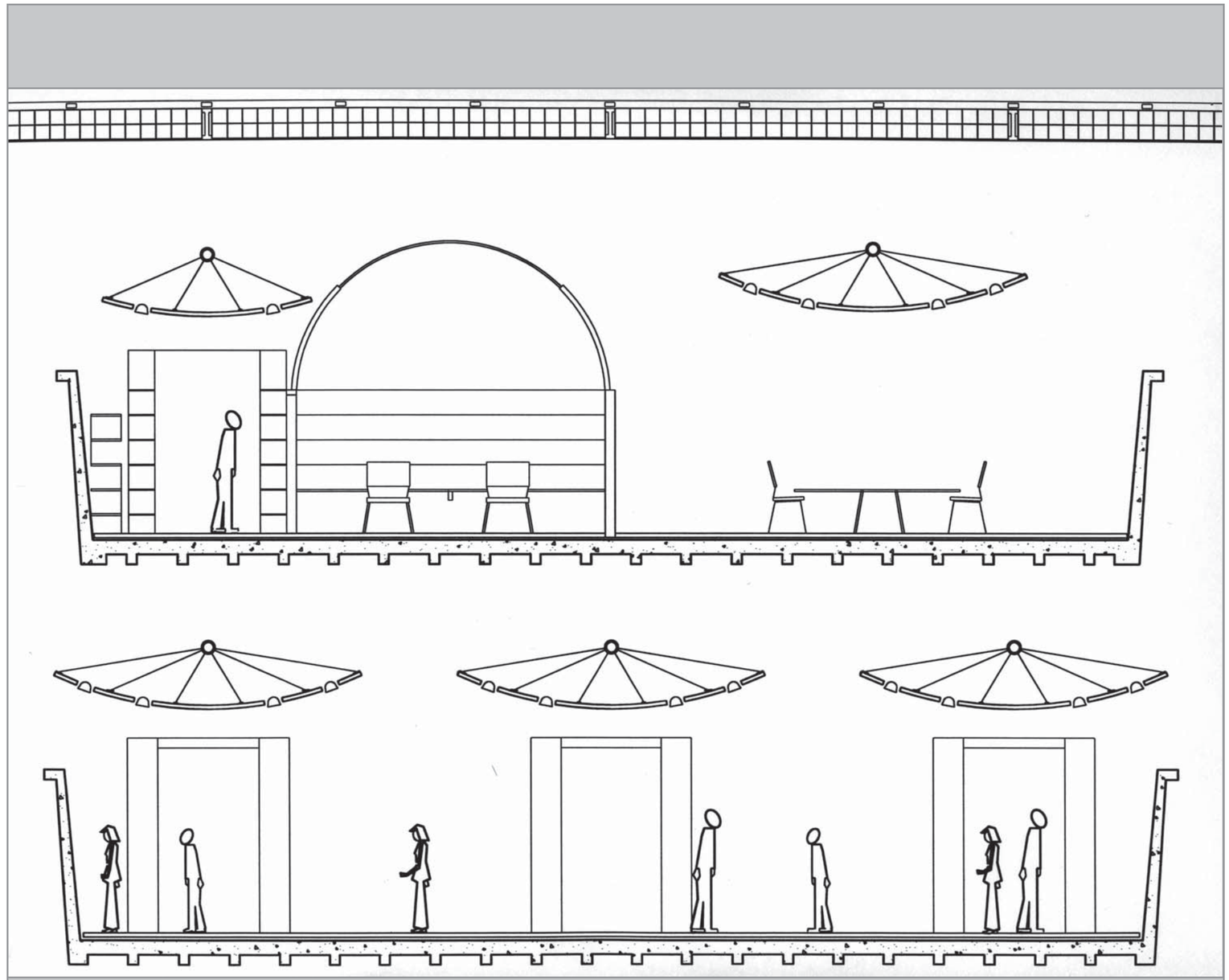


South Elevation

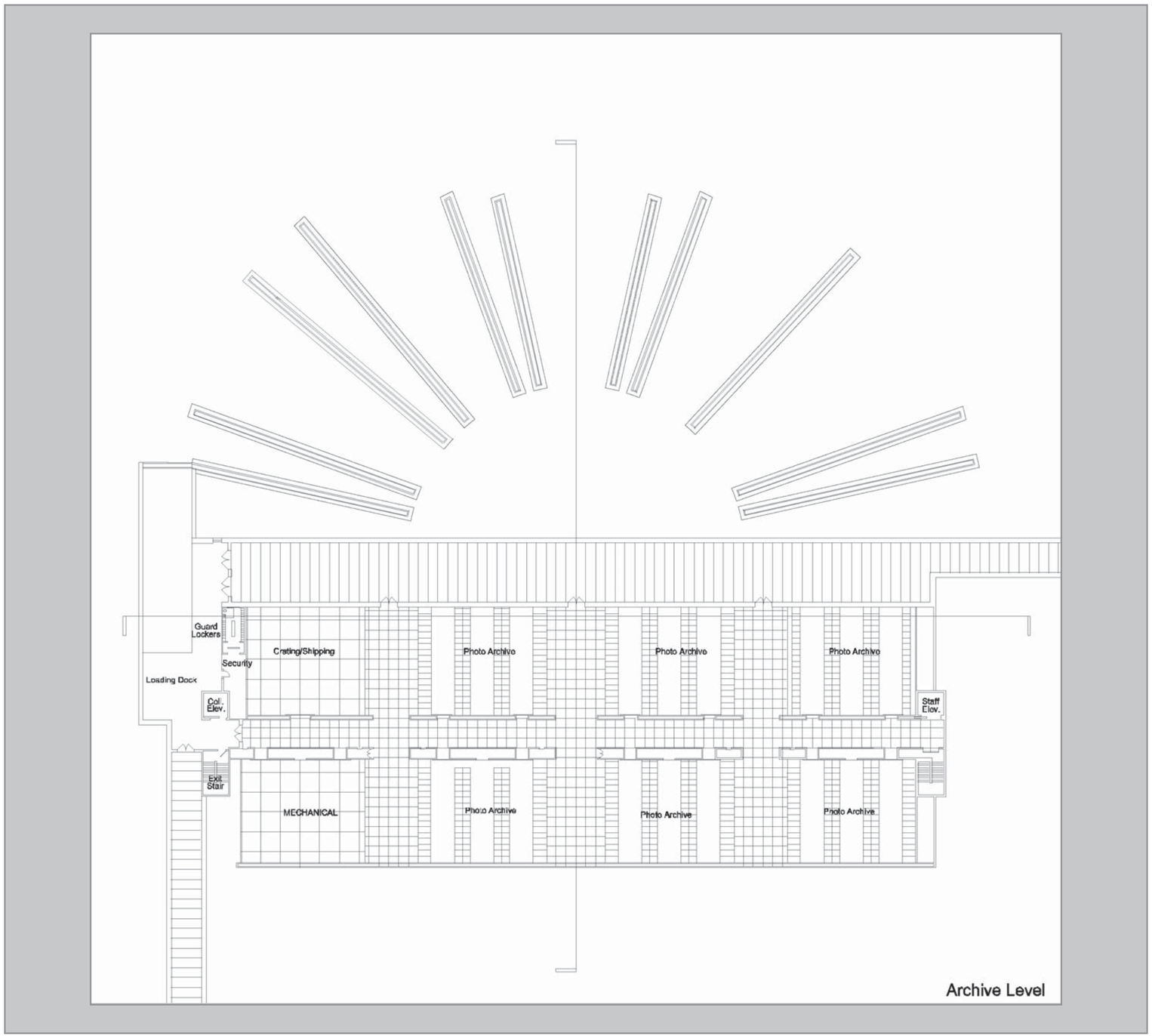


Gallery Section

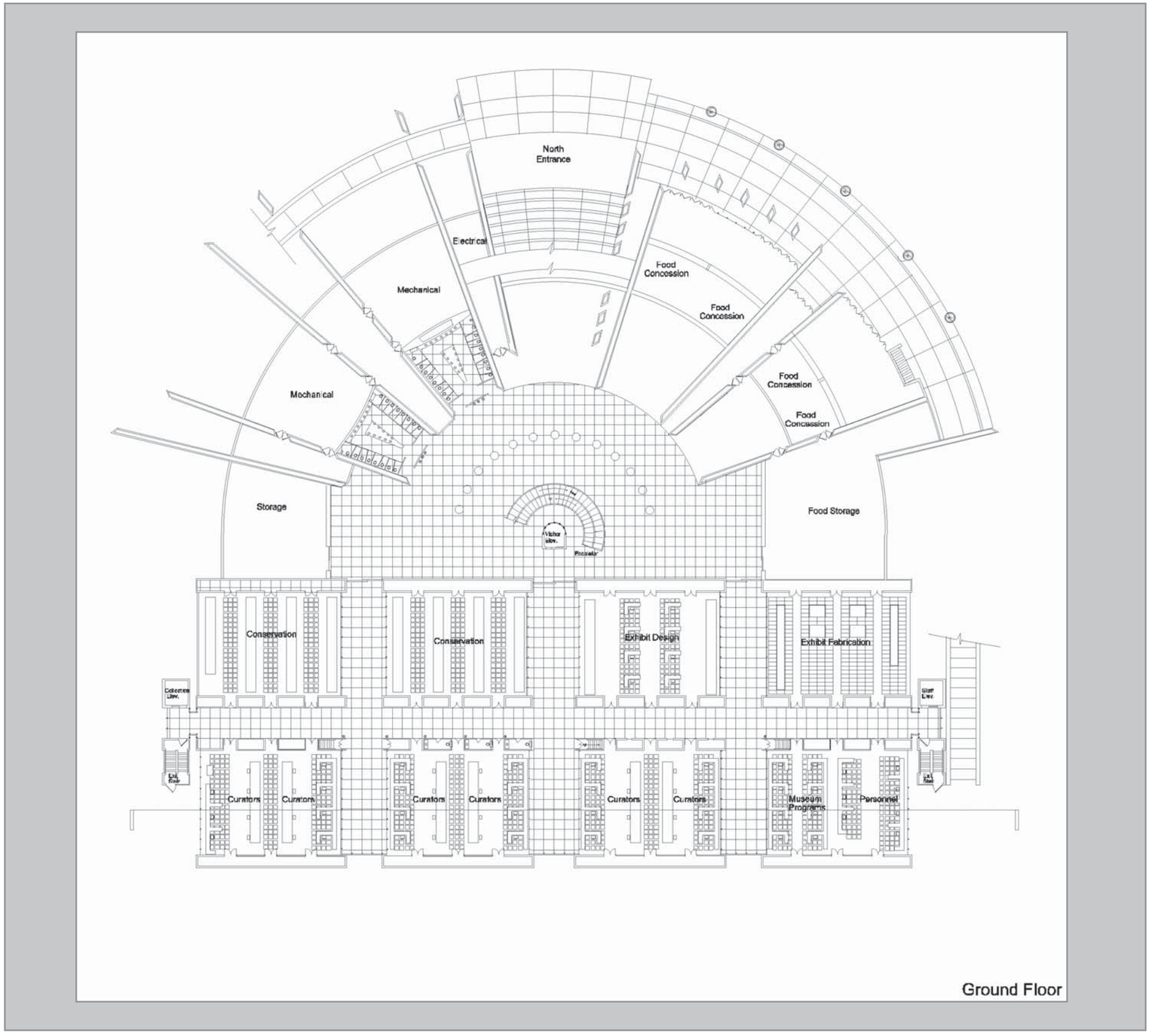




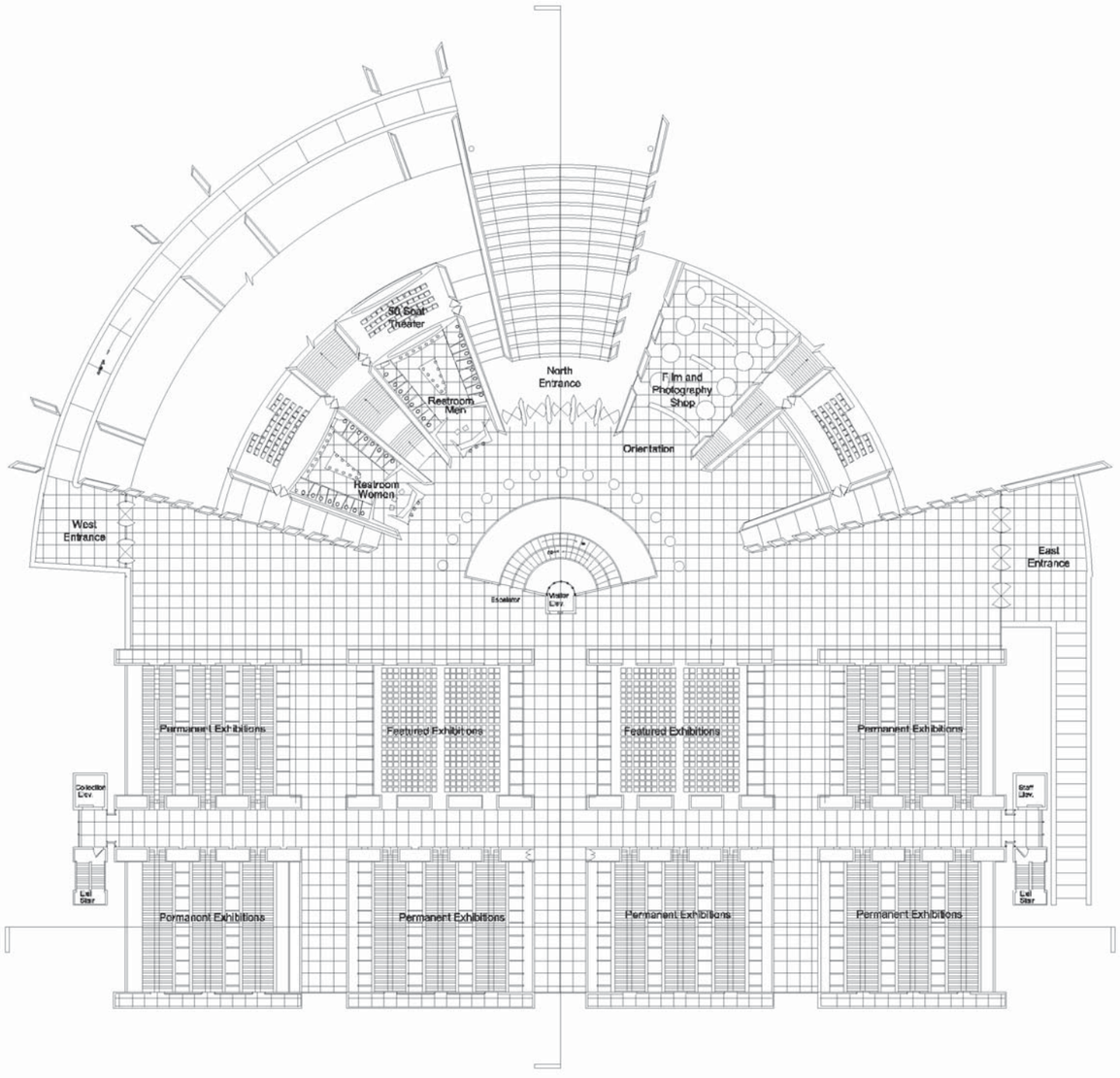
Gallery and Library Section



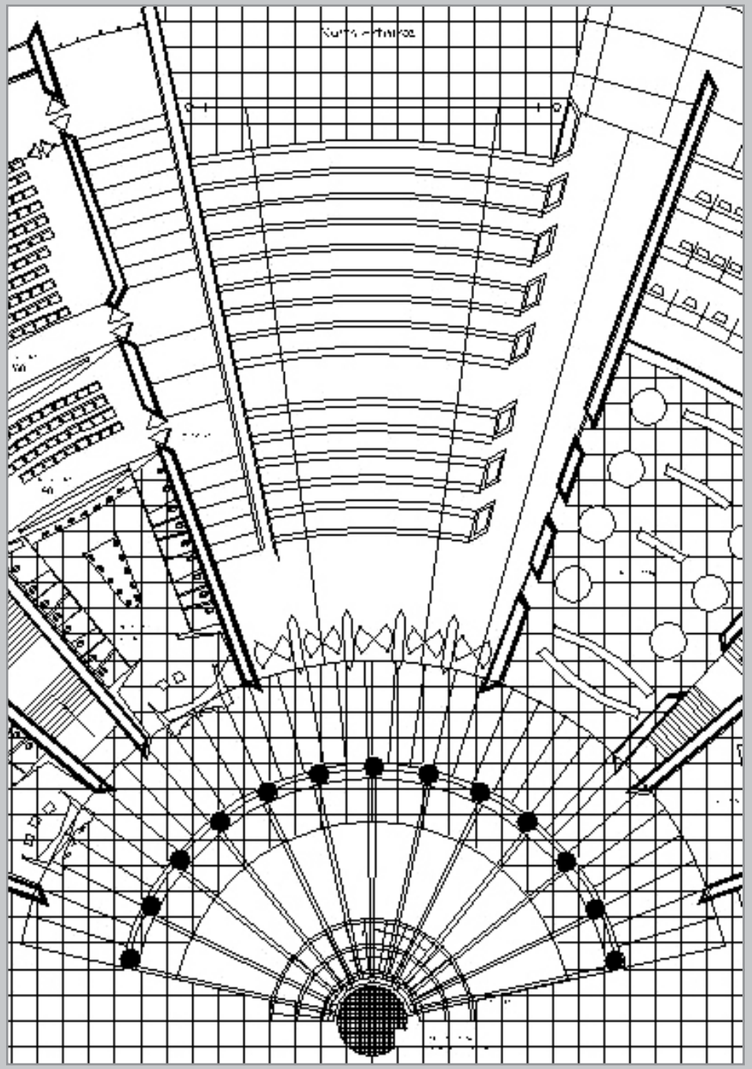
Archive Level



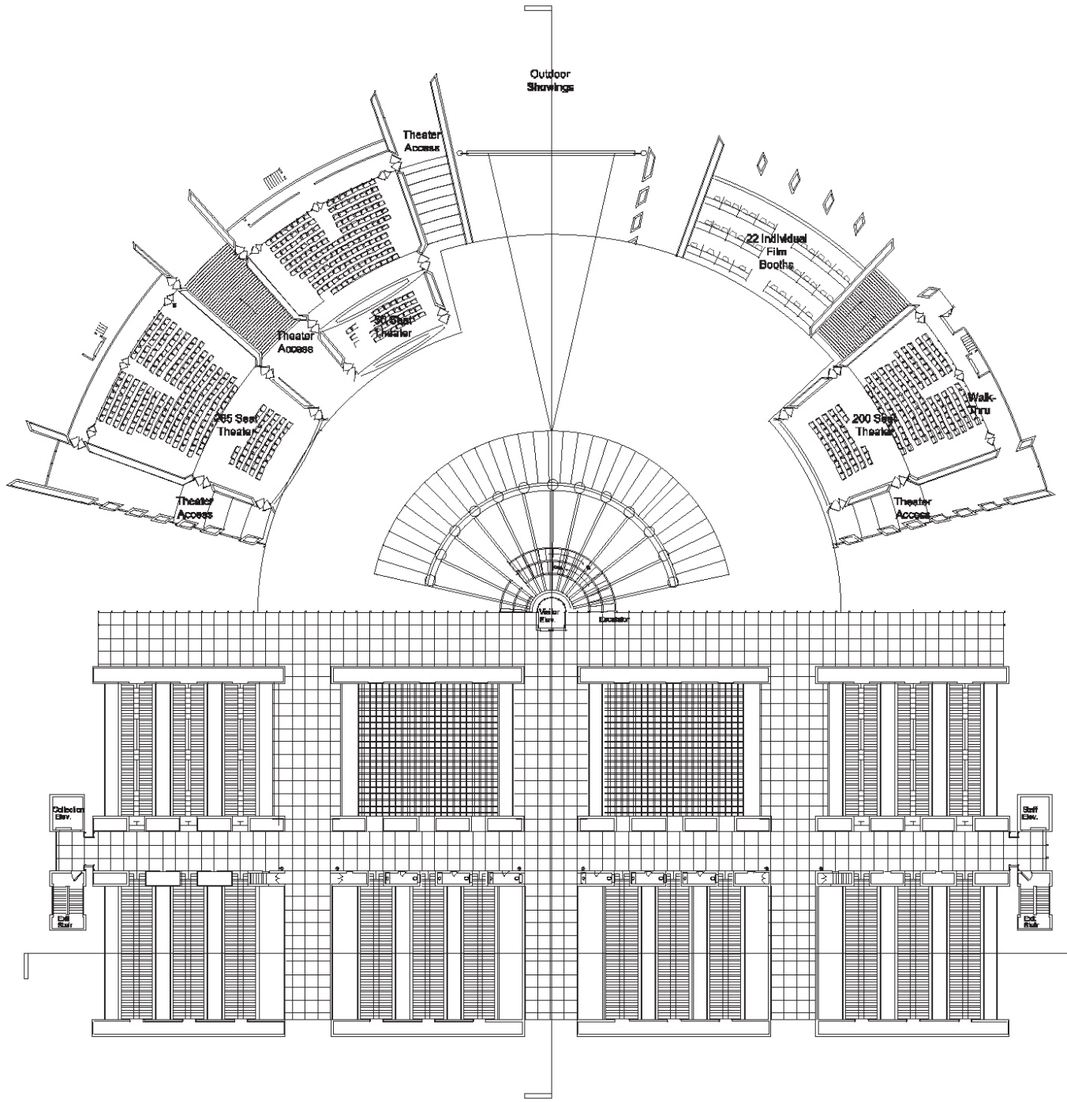
Ground Floor


30 Seat Theater
North Entrance
Film and Photography Shop
Restroom Men
Orientation
Restroom Women
West Entrance
East Entrance
Escalator
Visitor Elev.
Permanent Exhibitions
Featured Exhibitions
Featured Exhibitions
Permanent Exhibitions
Collection Elev.
Staff Elev.
Exit Stair
Exit Stair
Permanent Exhibitions
Permanent Exhibitions
Permanent Exhibitions
Permanent Exhibitions

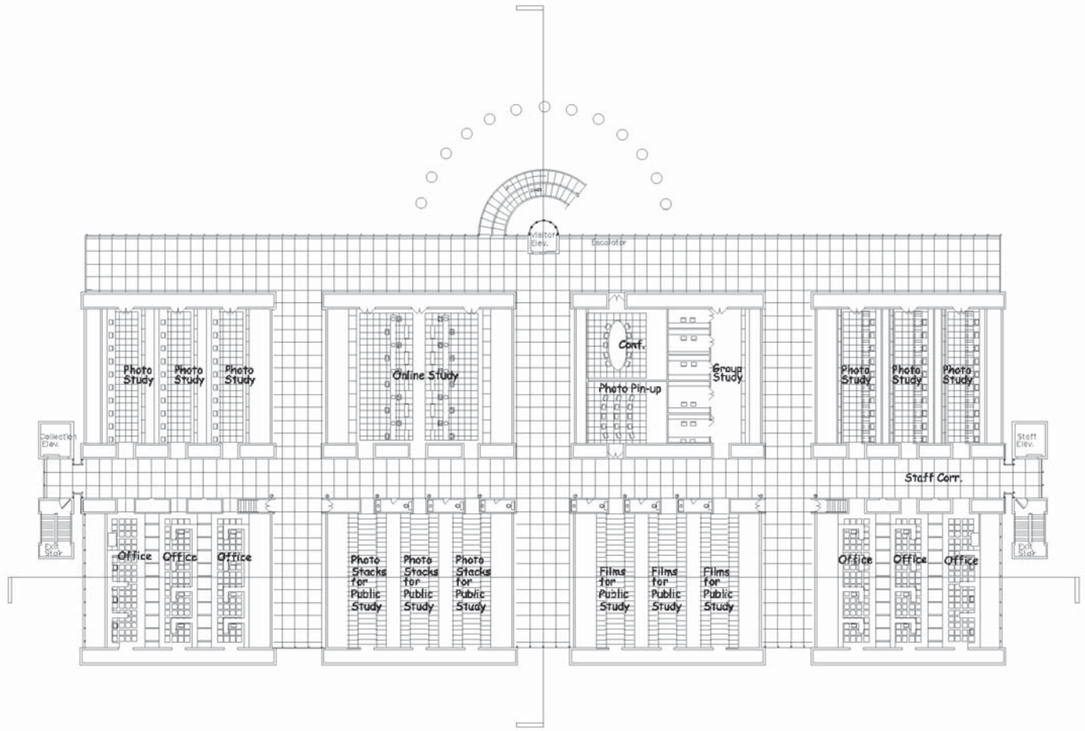
First Floor



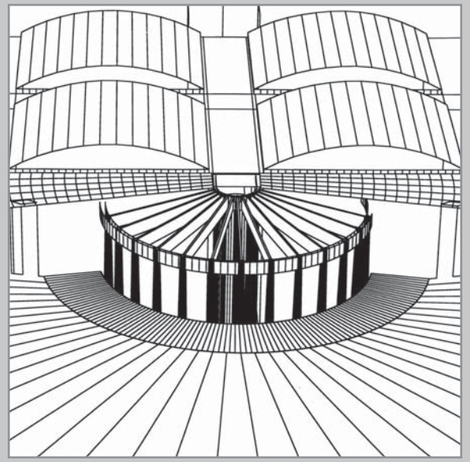
Public Entry Level



Second Floor


Visitor Elev.
Escalator
Photo Study
Photo Study
Photo Study
Online Study
Conf.
Photo Pin-up
Group Study
Photo Study
Photo Study
Photo Study
Collection Elev.
Staff Elev.
Staff Corr.
Exit Stair
Exit Stair
Office
Office
Office
Photo Stacks for Public Study
Photo Stacks for Public Study
Photo Stacks for Public Study
Films for Public Study
Films for Public Study
Films for Public Study
Office
Office
Office

Third Floor



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Master of Architecture- Virginia Polytechnic Institute and State University, 2003

Intern Architect- Ballinger, Architecture, Engineering, Planning, Interior Design, Philadelphia, Pennsylvania, 1998 - Present

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Analyst- United States Congress, Office of Technology Assessment, Washington, D.C., 1995

Board Member- Alexandria Commission on Persons with Disabilities, Alexandria, Virginia, 1991-1994

Intern Architect- Wheeler & Guay Architects, Alexandria, Virginia, 1991-1994

Marketing Associate- Rappahannock Westminster Canterbury, Irvington, Virginia, 1988- 1989

Assistant to County Administrator- Northumberland County, Virginia, 1986-1988

Associate Member- The American Institute of Architects, 1984

Intern Architect- Krommenhoek/McKeown & Associates, San Diego, California, 1984

Bachelor of Arts, Environmental and Interior Design- San Diego State University, 1984

Draftsperson- Randall Lamb Associates, Consulting Engineers, San Diego, California, 1981-1983

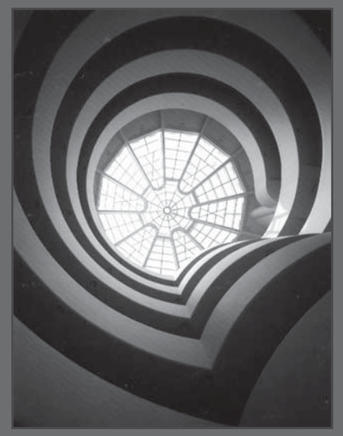
Certificate- Illuminating Engineers Society, Lighting Fundamentals, 1982

Collections Processor- Smithsonian Institution National Museum of Natural History, Washington, D.C., 1979-1980

Office Assistant- Smithsonian Institution, Office of the Assistant Secretary for Science, Washington, D.C. 1977

Diploma- W.T. Woodson High School, Fairfax, Virginia, 1976

Fig. 4.1 *skylignt of the Solomon R. Guggenheim Museum, Frank Lloyd Wright, photograph by David Heald. The Solomon R. Guggenheim Foundation, 3067,1992.*



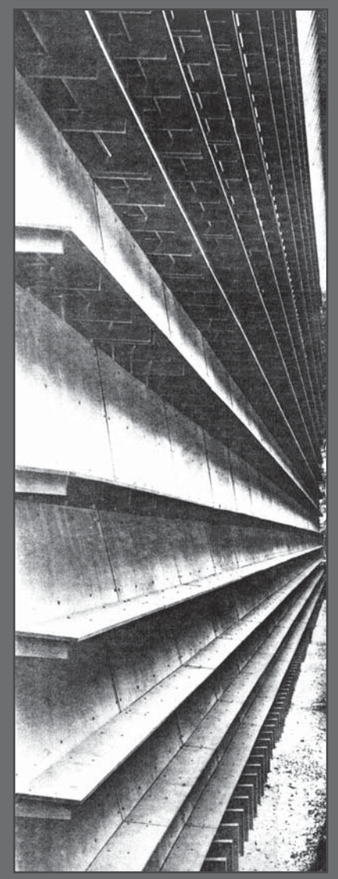


Fig. 4.2 *Storage building by Herzog & de Meuron 1989-1991, photo by author.*

Thesis defense with drawings. Photo-graph by Joan McDonald. February 2, 1998.