A

Cultural Forum

for the

INFORMATION   AGE

MATHAF

.

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Acknowledgements

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II. INTRODUCTION

II. INTRODUCTION

1. Objectives

"If you want to plan one year ahead..
plant a tree
If you want to plan ten years ahead,
sow a seed
If you want to plan one hundred years ahead.
educate the people"

<div align="right">

Kuan Tzu
(Chinese poet) 500 BC.

</div>

The successive emergence of technologies, have led us from the technology of raw material transformation, the technology of energy harnessing to the **technology of information**. The information age is bringing us a wide range of new communication technologies. These new technologies have challenged our traditional perception of space and time. This technological explosion began escalating during the 1980s and seem to be gaining snowball-like momentum.

In the present times, we are witnessing a process of "dematerialization" and "disintegration" of the art object, where we moved from the esthetics of the image to the esthetics of the object, and then to the esthetics of gesture and event, and finally to the esthetics of communication. The media of this esthetic is considered immaterial, it comes from the impalpable stuff of information technology.

"As we were witnessing fifteen years ago an era of cultural centers , we moved nowadays to the era of mediatheques", says du Besset.
Mediatheque is a function that seems to be lacking in this country. Its role would accommodate education as well as entertainment, using the necessary audio visual techniques. This center would be the reservoir of information that would be translated through images, sounds, books, magazines, films, displays...Thus, it will act as a cultural forum bringing people together in order to learn, get informed and at the same time have fun. The encounter space is where all technological media is superimposed on the physical space.

The aim won't be just importing a western typology, but integrating it into its context and also trying to revive and reflect the **identity** of the nation (housing elements that relate to the Lebanese culture, i.e. Lebanese film archive...). The

Lebanese identity is undergoing a crisis facing the international standardization, especially after 17 years of chaos. The search of the Lebanese identity has not been solved yet. The project will not pretend to, but it will reflect some of the characteristics of the Lebanese culture: its diversified and mosaic of heritage, its role as a meeting point between the western and eastern cultures.

This project will incorporate an investigation about the different media, its different manifestations: photography, printing, cinema, simulation, holography, laser, video, computer graphics... and its implication on architecture.

An architectural investigation also will be undertaken to address the image of the project addressing the Museum **node** with the two different expressions of the museum and the ex-parliament. The interest of the location, lies in inserting this project in an extremely rich area charged with cultural and historical meanings.
The study of the open space as a public square for the node, will be also considered.

2. Scope of the project

The project will address a wide scope of users: children, teenagers, students, professionals and interested general public... It will go beyond serving Beirut and its surroundings, thus, addressing the national scale. The expected number of users per day is 1000. The allowable total built up area is approximated to 8500 sq. m.

The project offers mainly three types of functions:
- educational / cultural
- commercial / recreational
- administrative / production

The educational / cultural section includes exhibition spaces, library, multimedia displays and conference room. The exhibition spaces include a temporary exhibition and a permanent exhibition. The temporary exhibition will house art and scientific experimental production relating to the new media, while the permanent exhibition could illustrate the history and development of the media. The library incorporates books mostly relating to the multimedia with a section for children. Adjacent to it is the multimedia section with projection rooms, computer labs, audio terminals. The conference room might host lectures about culture and media.

The commercial / recreational section includes cafe, restaurant, discotheque, media theater, VR shows, records tower and shops. The media theater will provide the experimental stage for works of innovative artists. The retail section including the record tower and shops will sellbooks and the different types of audio visual records: videos, laser disks, compact disks...

The administrative / production section incorporates administration offices, workshops and research and multimedia production responsible for the preparation of the different audio visual displays.

3. Purpose of project

Architectural goals

At the end of the 20th century, the condition of architecture is undergoing profound changes that are linked with the condition of society, art and technology.
The effect of the new media is unmistakably visible in all the modes of human expression, one of them is architecture.

The project will reflect this aspect in the treatment of its image. The other dimension that will shape the project is the resolution of the functional complexity.

Desired image
The project needs to assert itself as a prominent landmark in this location, establishing a dialogue with the buildings surrounding it but at the same time standing out.
Technology as a media will also be reflected.
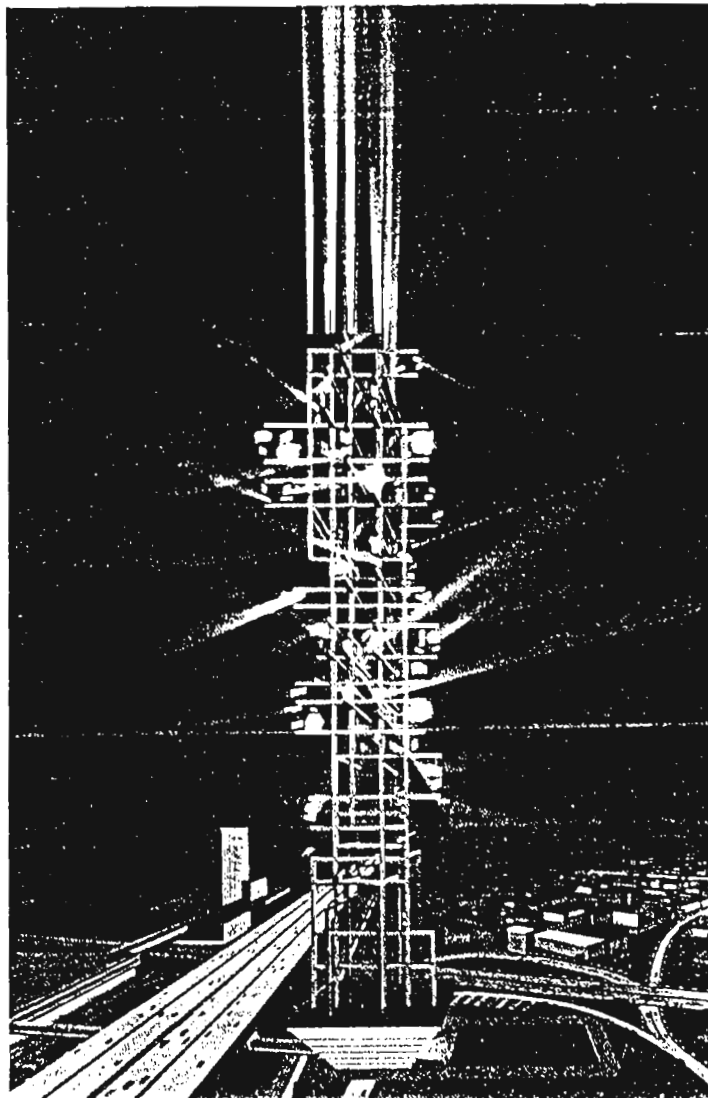
Social Goals

"We have now become aware of the possibility of arranging the entire human environment as a work of art, as a teaching machine designed to maximize perception and to make everyday learning a process of discovery."

<div align="right">

Marshall Mc Luhan
The Medium is the Message

</div>

The project aims at creating a meeting place for people from different backgrounds and a range of age groups. It is a place where people see other people and are seen. As Guy Debord says: *"The spectacle is not a collection of images; rather, it is a social relationship between people that is mediated by images"*. The visitor is invited to go beyond passive observation to **active participation.** A combination of educational and entertainment activities are offered.
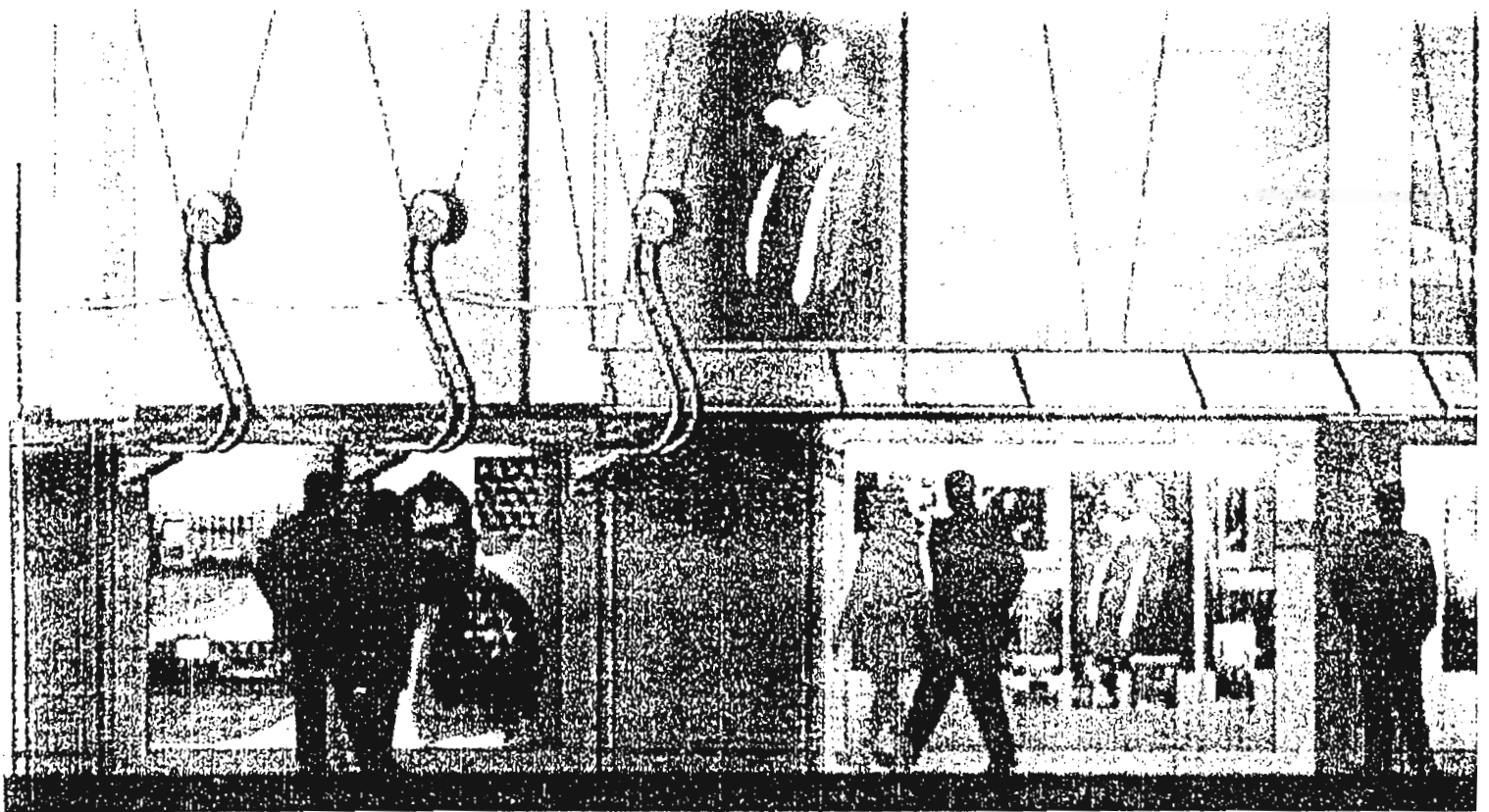
The project will be funded by the Ministry of Culture and Education. It is non profit making, but it incorporates some functions (restaurant, cinemas and rental of specialized boutiques...), that might raise money and support the complex financially. Thus, financing part of the expensive equipment required in such a facility. The contribution of the government might be by offering the land and exempting the project from taxes.
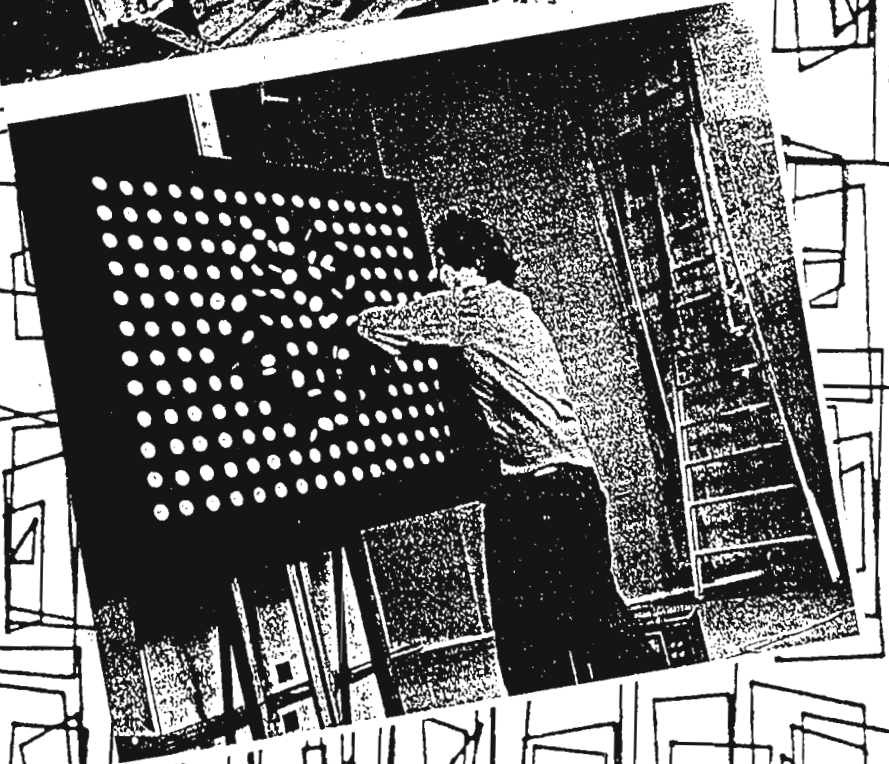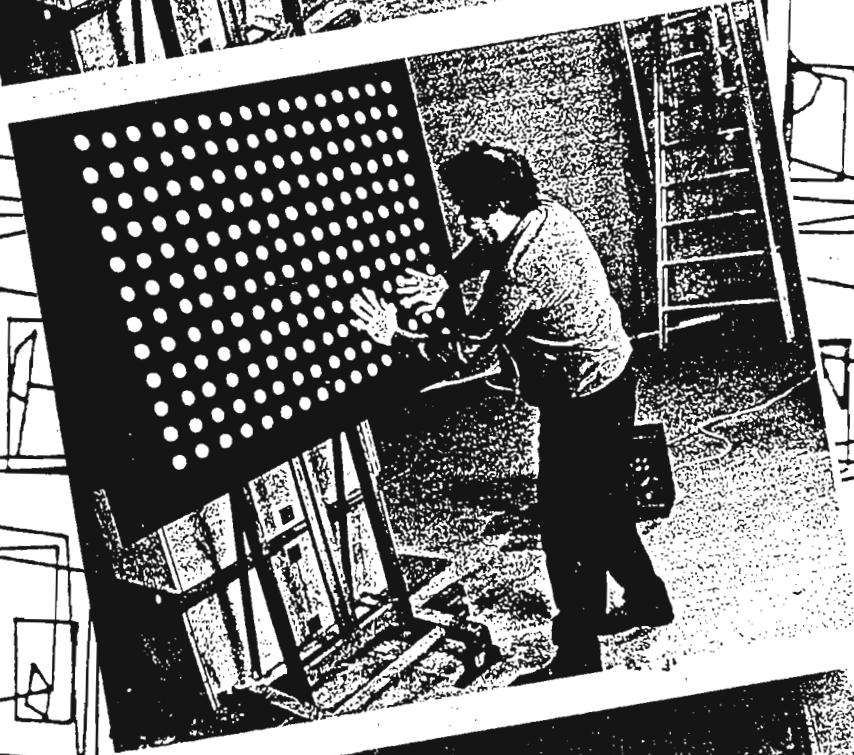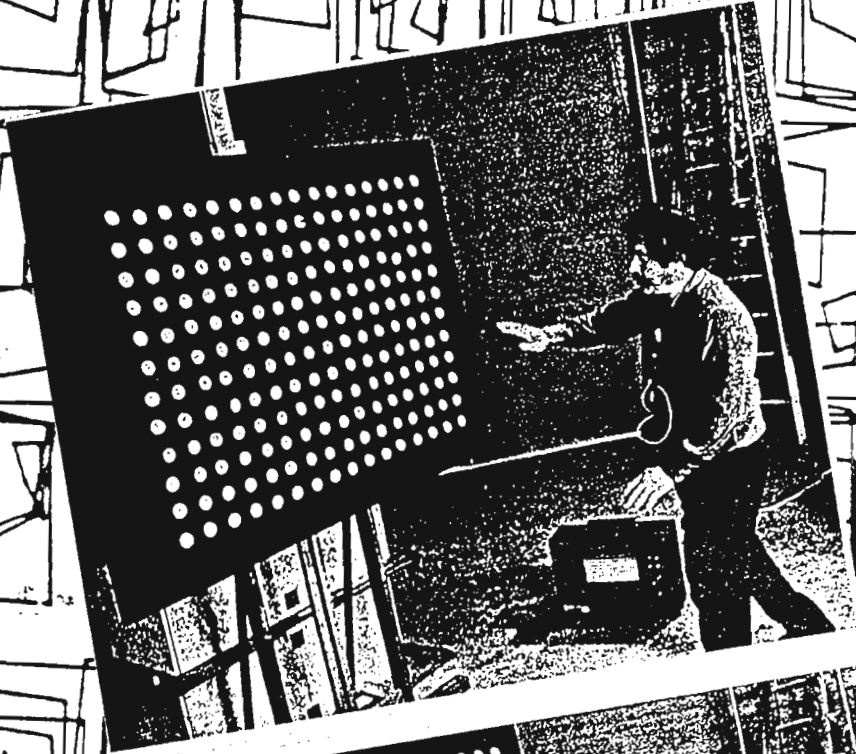
Media and Architecture before and through the information age

In 1980, Alvin Toffler's <u>The Third Wave</u> explained how civilization was in transition between the second and third great cycles of human history. The first cycle was the agrarian society, which existed until the second cycle, the industrial age, was ushered in the late eighteenth and nineteenth century. The third cycle which is now replacing the industrial society, is the information age.

The emergence of the new media have been criticized as spreading alienation. On the other hand, this new technology has the potential to expend our perception and extend our sensorial faculties. While the machine is an extension of the body, the electronics device an extension of the awareness (nervous system).
The effect of the new media is unmistakably visible in all the modes of human expression, one of them is architecture.

"Cyberspace ... a graphic representation of data abstracted from the banks of every computer in the human system." William Gibson

The introduction of **cyberspace** with its dimensions of meaning have led to a cyberreal architecture. Cyberspace creates environments characterized by new kinds of social interaction unconstrained by spatial and locational boundaries.

"The appearance of permanence (i.e. buildings are solid; they are made out of steel, concrete, bricks, etc.) is increasingly challenged by immaterial representation of abstract systems (television and electronic images)." Bernard Tschumi

One of the manifestations that has affected architecture is **cinema.**
The lasting dimension of architecture is opposed to the transient character of images. Trying to stir emotion and touch the spectator, the visitor, that is part of being producer of architecture or cinema.
. According to Jean Nouvel, the architect-creator is influenced by the considerable pictorial production in today' s world, in various domains and particularly that of cinema. The question, today, says Paul Virilio, is no longer to know if cinema can do away with place, but if places can do away with cinema. One can explore the **kinetic** and **narrative** powers of cinema and use its element of fantasy as a source of inspiration.
An opposition separates cinema and architecture is that the immateriality of the image is confronted with the materiality of architecture.

Light. Film is all about light and it is through light that we are aware of architecture.

Manipulation of **time** is one of the characteristics of cinema: it is able to compress 20 years into 1 minute or extend 4 seconds into 20 minutes. The disappearance of unstable images: 24 images per second cinema, video and computer-generated images.

Illusion
*"Human love for fiction often makes fiction seem more real than the real thing."* Stephen Kliment

The business of the film-maker is to transfer the viewer from one world, his own, to another, created by film. ' Moving pictures' in film have brought the observer closer to the object. This total involvement in the story increases the psychic proximity leading to a loss of self. In addition, the simulation methods used in 3-D films have decreased the distance between the viewer and the image. The degree of illusion has reached the point of complete identification with the movement of images and the viewer's sense of movement, like in the case of mountain and valley train effects.
We have reached a point where simulation has taken the place of illusion.
" We have on the brink", wrote Harvey Reinhold in his book about virtual reality," *of having the power of creating any experience we desire."*

" Image today is no longer this planar object designed only for the eyes; it is a space where we can introduce things that we can touch, manipulate, hear, and that resists or gets animated at the touch of our hands."

In a way, architecture traps us in a world of its own that could be removed from its surrounding.
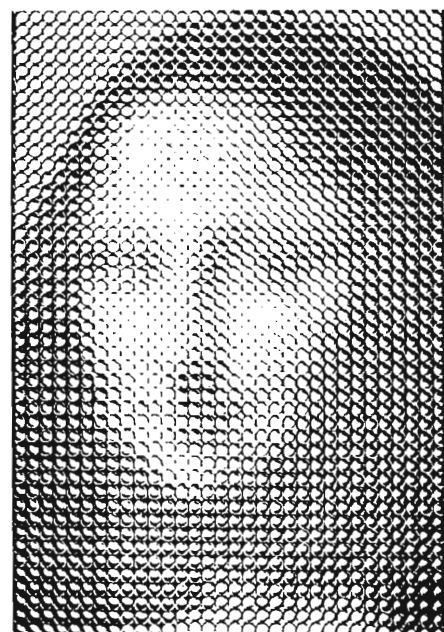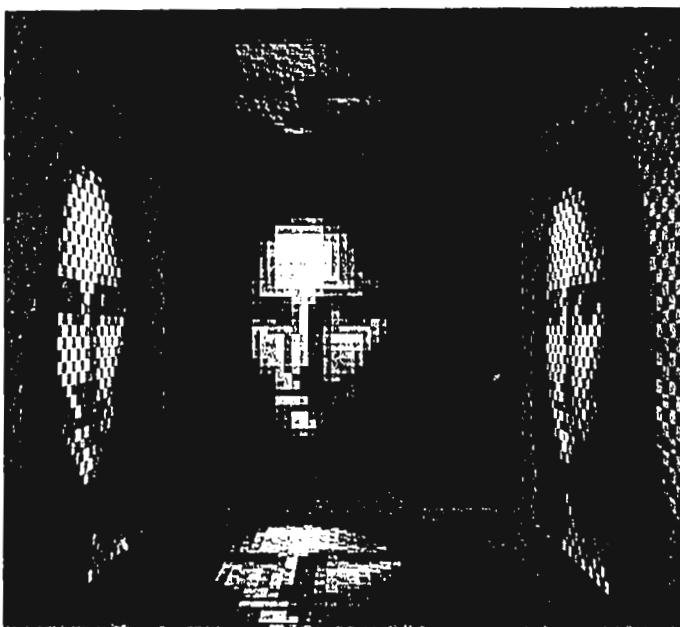
" During the fifty years since the Second World War, a paradigm shift
has taken place that should have profoundly affected architecture:
this was the shift from the mechanical paradigm to the electronic
one. (...)

The entire nature of what we have come to know as the reality of our
world has been called into question by the invasion of media into
everyday life. (...)

Clearly, a change in the everyday concepts of reality should have had
some effect on architecture. It did not because the mechanical
paradigm was the *sine qua non* of architecture; architecture was the
visible manifestation of the overcoming of natural forces such as
gravity and weather by mechanical means. Architecture not only
overcame gravity, it was also the monument to that overcoming; it
interpreted the value society placed on its vision.

The electronic paradigm directs a powerful challenge to architecture
because it defines reality in terms of media and simulation; it
values appearance over existence, what can be seen over what is.
(...)
Media introduces fundamental ambiguities into how and what we see.

Architecture will continue to stand up, to deal with gravity, to have
'four walls'. But these four walls no longer need to be expressive of
the mechanical paradigm. Rather they could deal with the possibility
of these other discourses, the other discourses, the other affective
senses of sound, touch and of that light lying within the darkness.

<div align="right">PETER EISENMAN</div>

Visions Unfolding: Architecture in the Age of Electronic Media
Architectural Design Sep./Oct. 1992
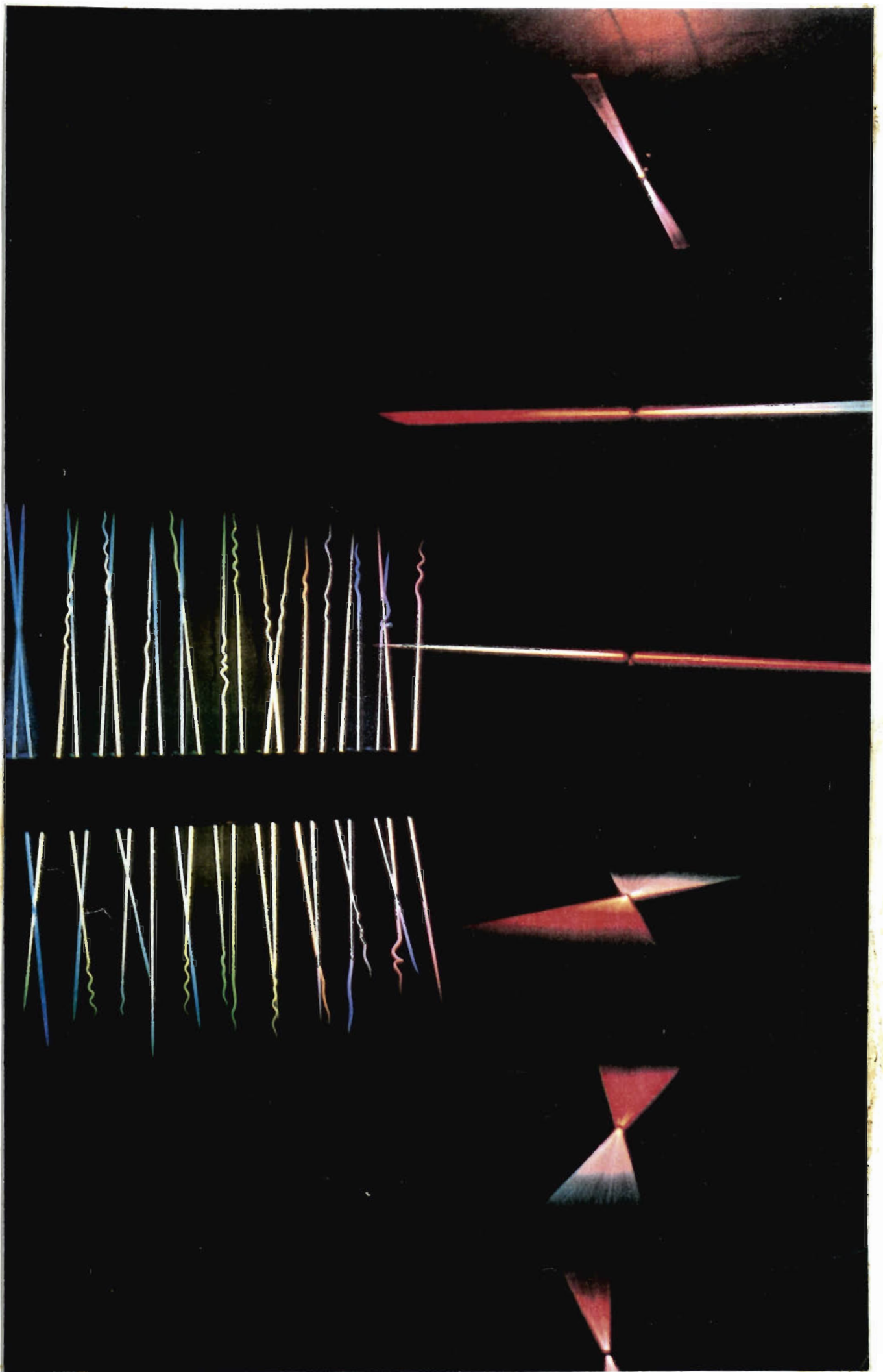
Perception and Communication

Communication is defined as the exchange of meanings between individuals through a common system of symbols.This topic has been a concern of scholars since the time of Ancient Greece.
I. A. Richards, english literary critic offered a definition of communication as a discrete aspect of human enterprise:
" *Communication takes place when one mind so acts upon its environment that another mind is influenced, and in that other mind an experience occurs which is like the experience in the first mind, and is caused in part by that experience.*"
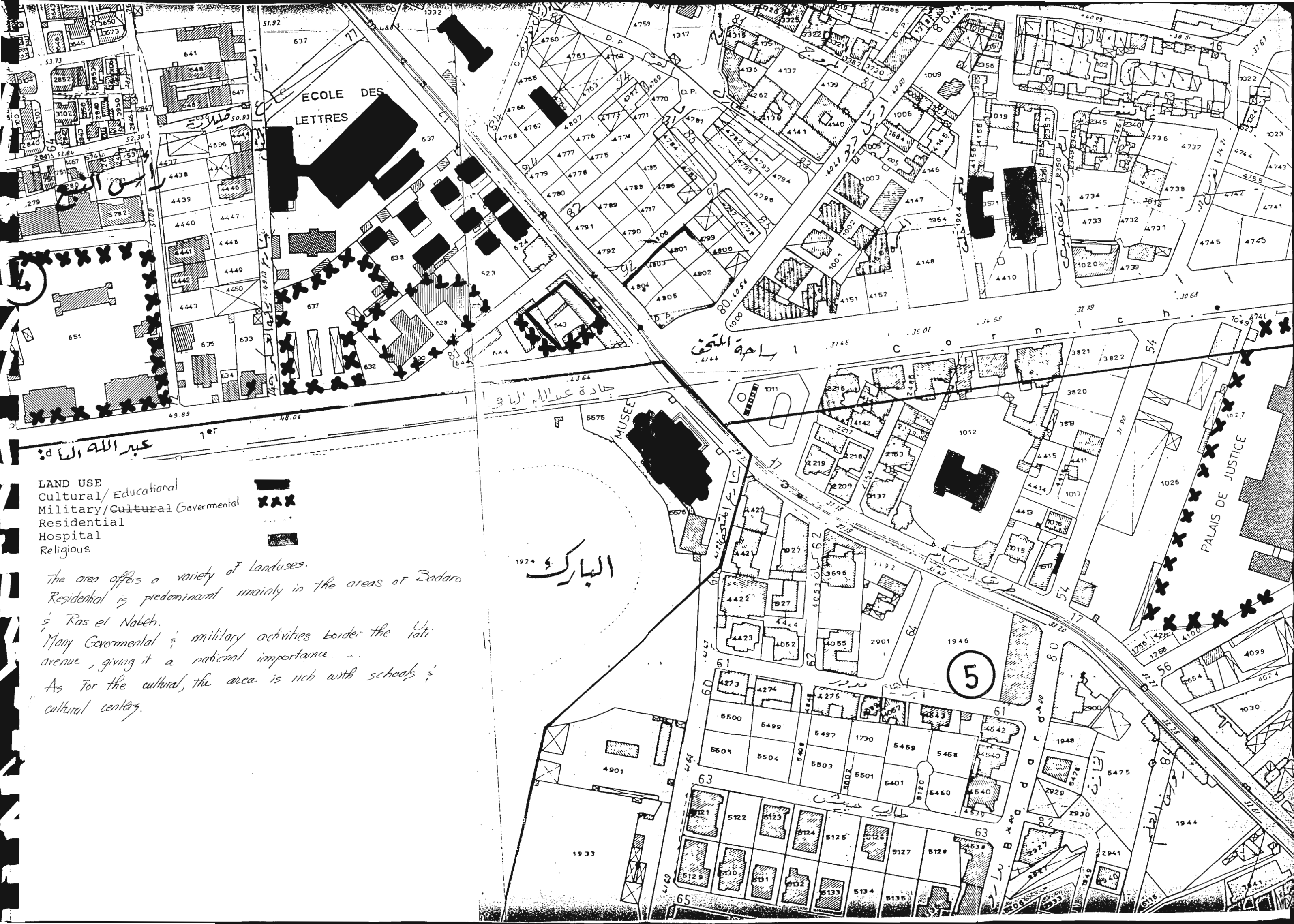
It is the advance in technology and science that has stimulated interest in communication and by their nature have called attention to man as a communicating creature. Telephone and telegraph were the first examples of inventions resulting from technological expertise. The development of popular newspapers and periodicals, broadcasting , motion pictures and television led to institutional and cultural innovations that permitted efficient and rapid communication between a few individuals and large populations.

Everything that occurs in communication falls under one of the three following categories:
- perception
- expression
- reception

Perception is the process whereby the individual becomes aware of the world around oneself. We use our senses to apprehend objects and events. Eyes, ears and nerves ending in the skin help us maintain contact with our environment and collect data for the nervous system. Within the nervous system the impressions so received are changed into electrical and chemical events in the brain. The result is an internal awareness of the object or the event. Thus, perception precedes communication.

In the words of Napoleon, *"to magnetize the crowds, one should address their eyes first"*.

LAND USE
Cultural/ Educational
Military/Cultural Governmental
Residential
Hospital
Religious

the area offers a variety of landuses.
Residential is predominant mainly in the areas of Badaro
& Ras el Nabeh.
Many Governmental & military activities border the 1st
avenue, giving it a national importance.
As for the cultural, the area is rich with schools &
cultural centers.

ECOLE DES
LETTRES

MUSEE

PALAIS DE JUSTICE

⑤

**III. SITE DOCUMENTATION AND ANALYSIS**
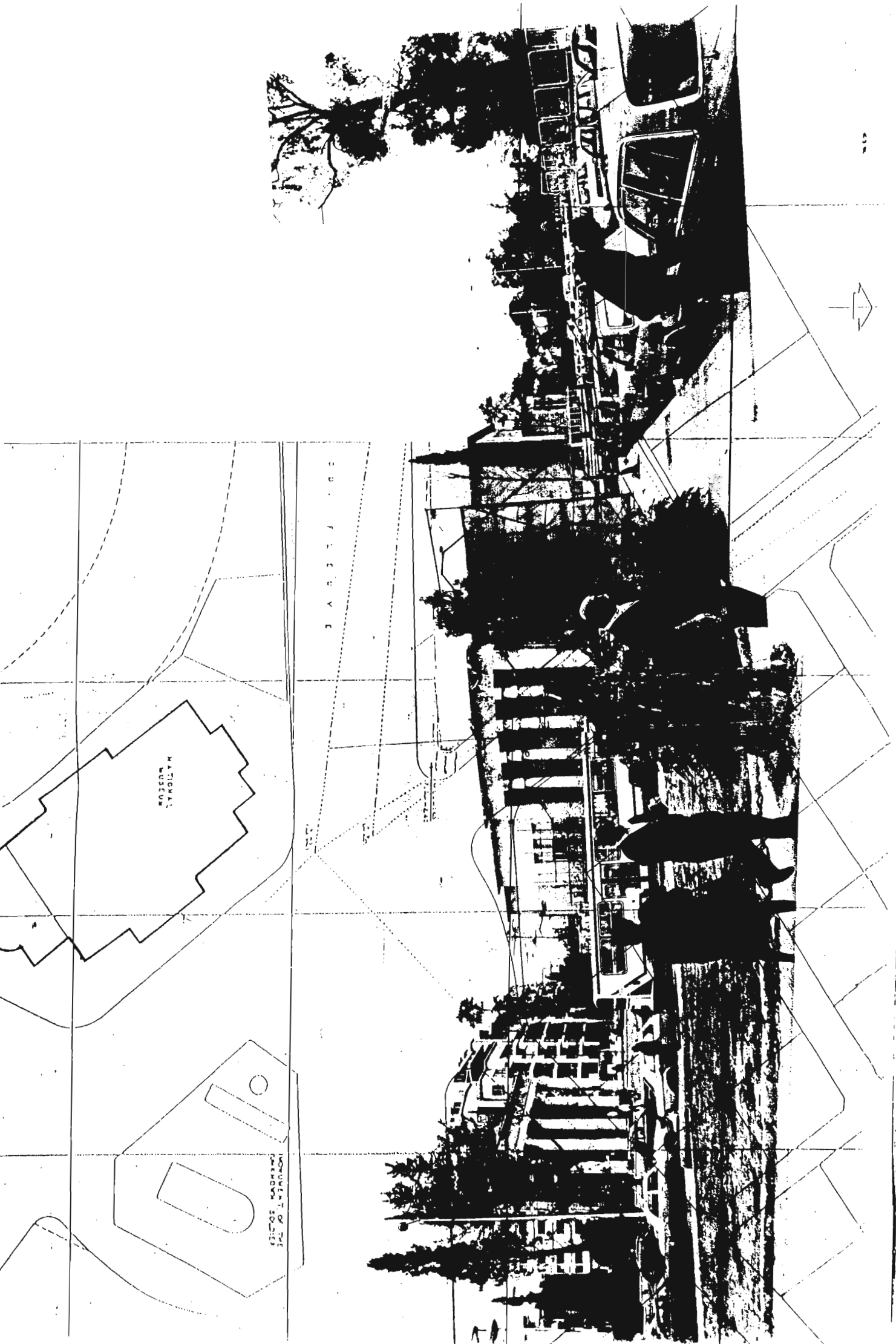
NATIONAL MUSEUM

III. SITE ANALYSIS

1. Site location

The proposed site for my final year project is located in Beirut, in the Mathaf area, and precisely on the Mathaf node, north of the National Museum. It is a corner site at the intersection of Al-Yafi Avenue and Damascus Road and Hotel Dieu Street. It is edged from the other two sides by secondary streets. The site is now an empty lot with greenery and a sign prohibiting access due to the presence of explosives. This node is delineated by the National Museum on one side, the ex-Parliament building and the memorial of the Unknown Soldier, on the two other sides.
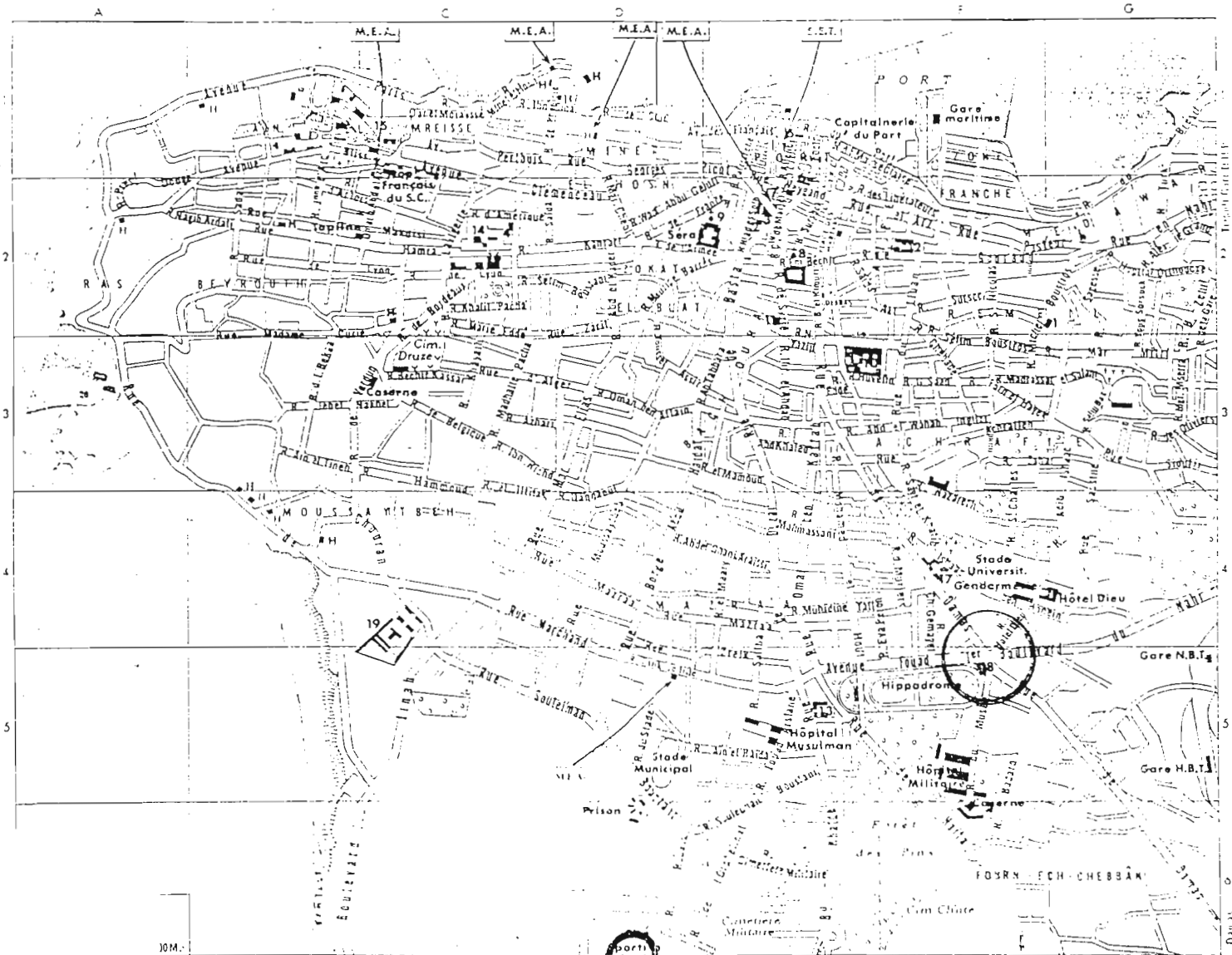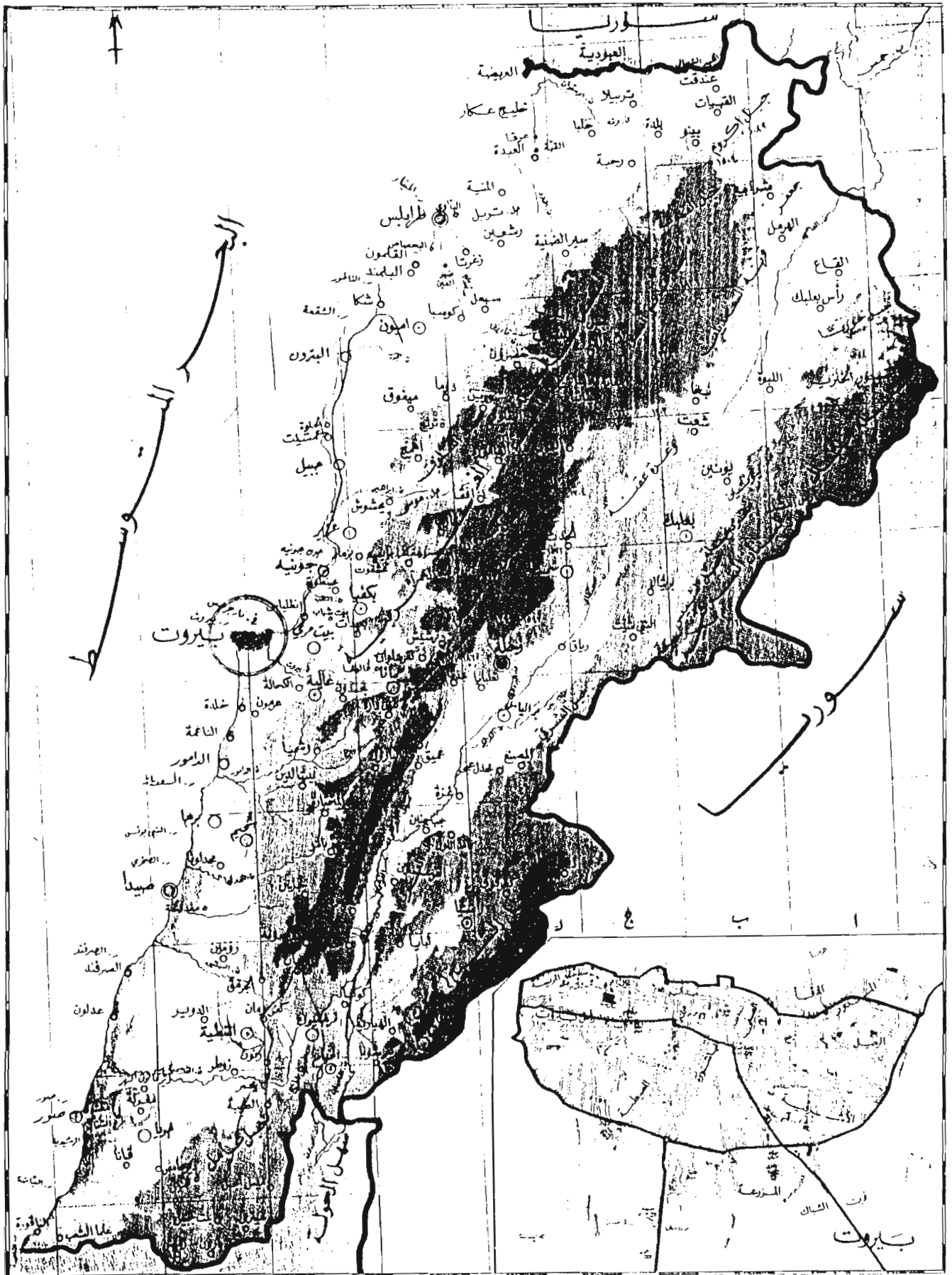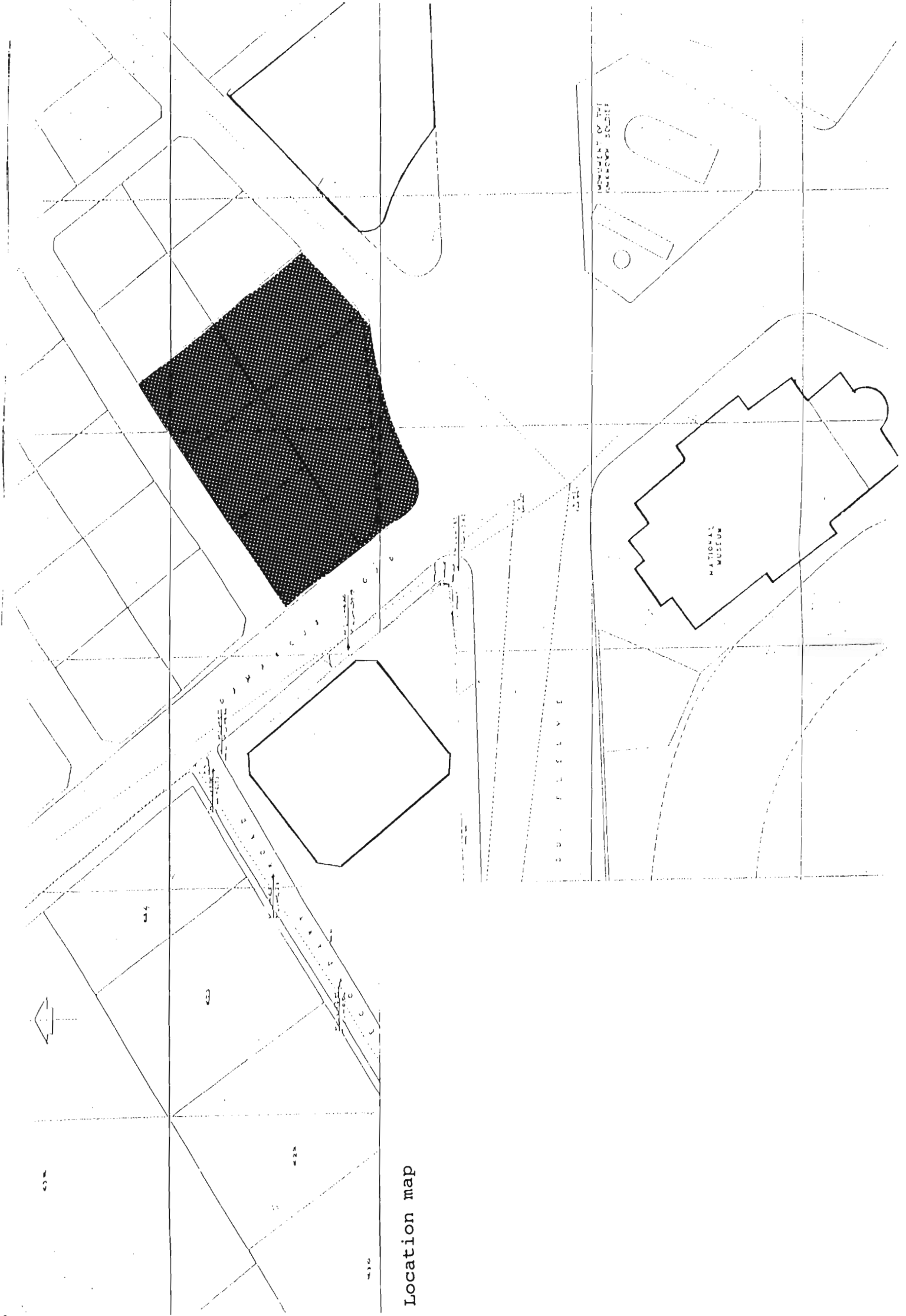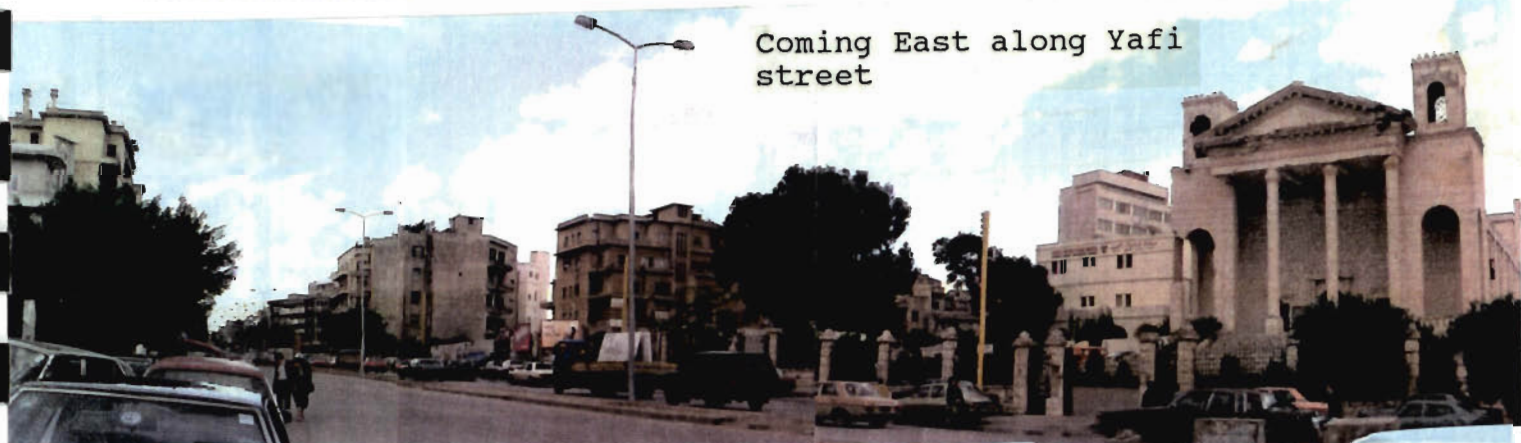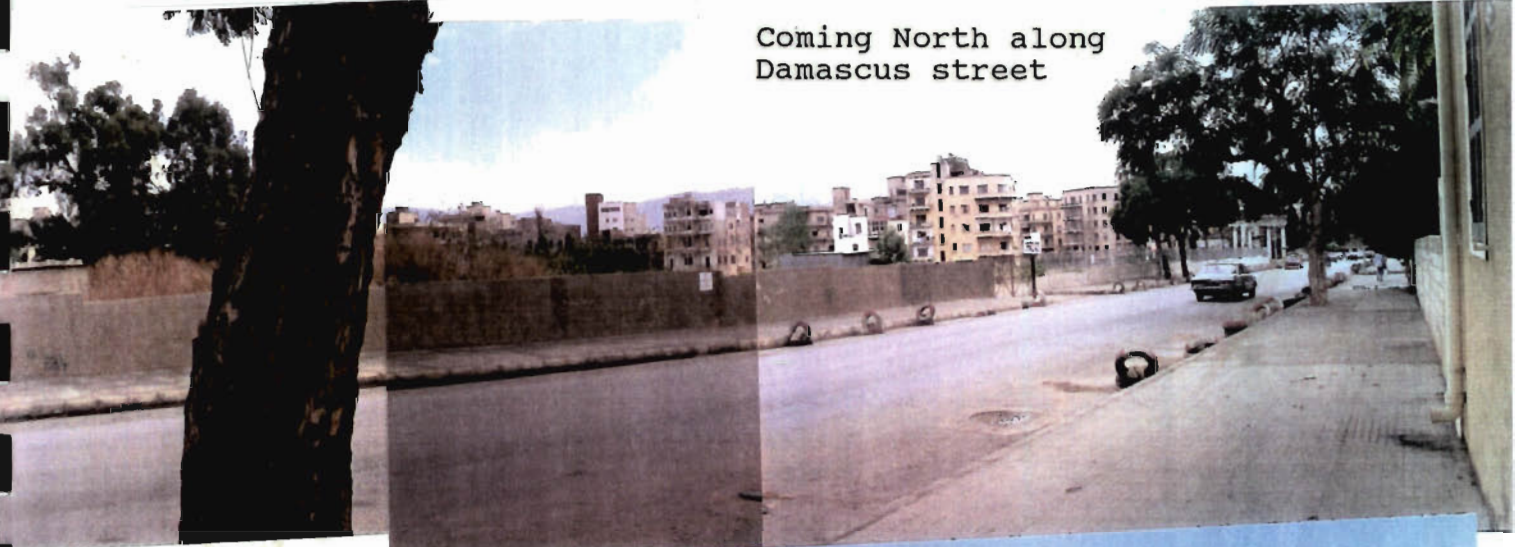
Location map
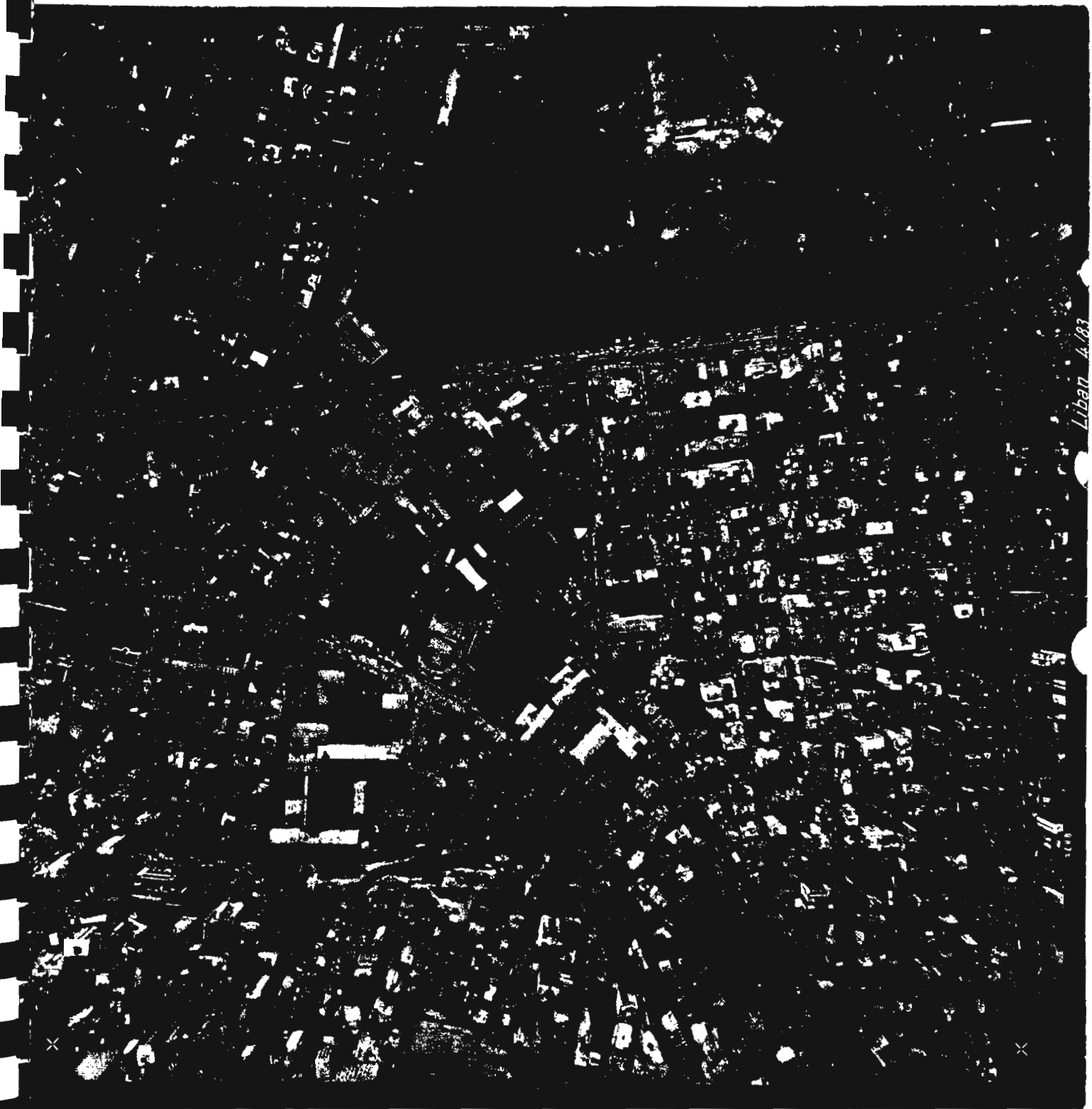
Liban 4.83
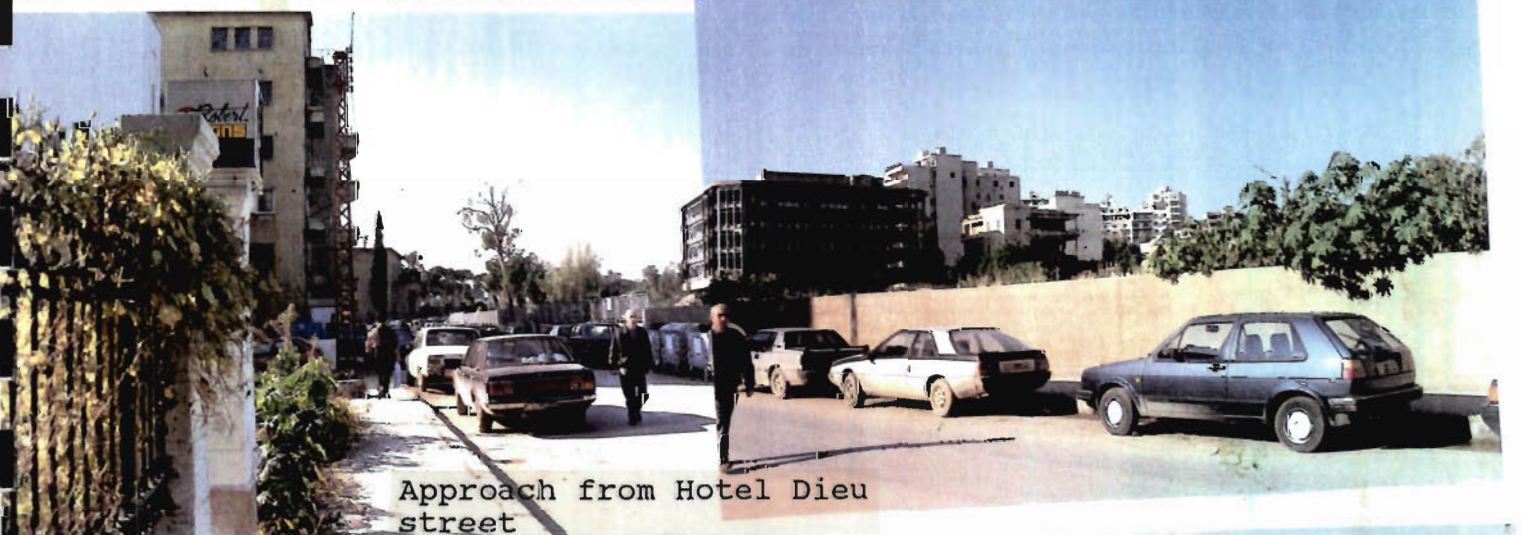
Coming East along Yafi street

Coming North along Damascus street

Approach from Hotel Dieu street

Coming North along Damascus street

Southern approach along Damascus road

View from Rizk tower

View from a residential
building next to the
Museum

View from a residential
building next to the
Museum

2. Site accessibility

The site is accessible from the Abdallah Yafi Avenue and from the Damascus Road, both major two way vehicular arteries, and also from Hotel Dieu street. As for the two secondary streets, they are planned but not yet existent. Moreover, the local bus has a stop servicing the area.
Due to the nature of the project addressing a national scale rather than a local level, accessibility will be primarily depending on vehicular circulation rather than pedestrian. As opposed to the more intimate scale of the Damascus Road, shaded with trees, the Yafi avenue offers a different experience. Wider, it carries a heavier traffic. Coming from Barbir it offers a vista on the mountains.

29. SYRIE — BEYROUTH — Le Quartier St-Elie - Route de Damas
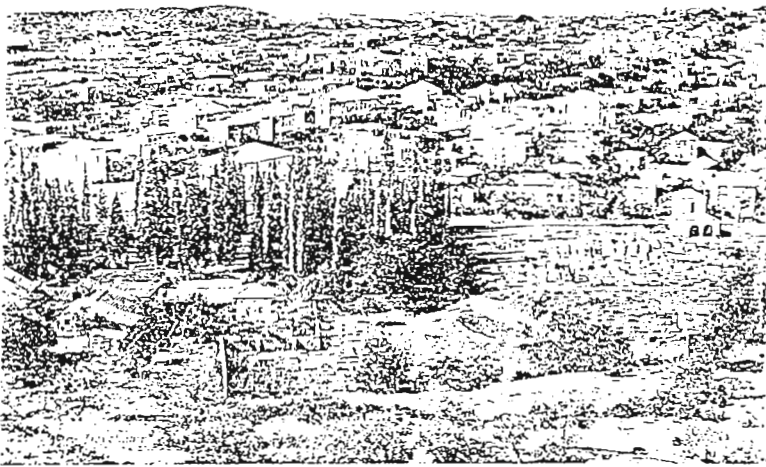
33. SYRIE — BEYROUTH — Quartier de Basta - Rue de Damas

Beyrouth - Colline de Nazareth
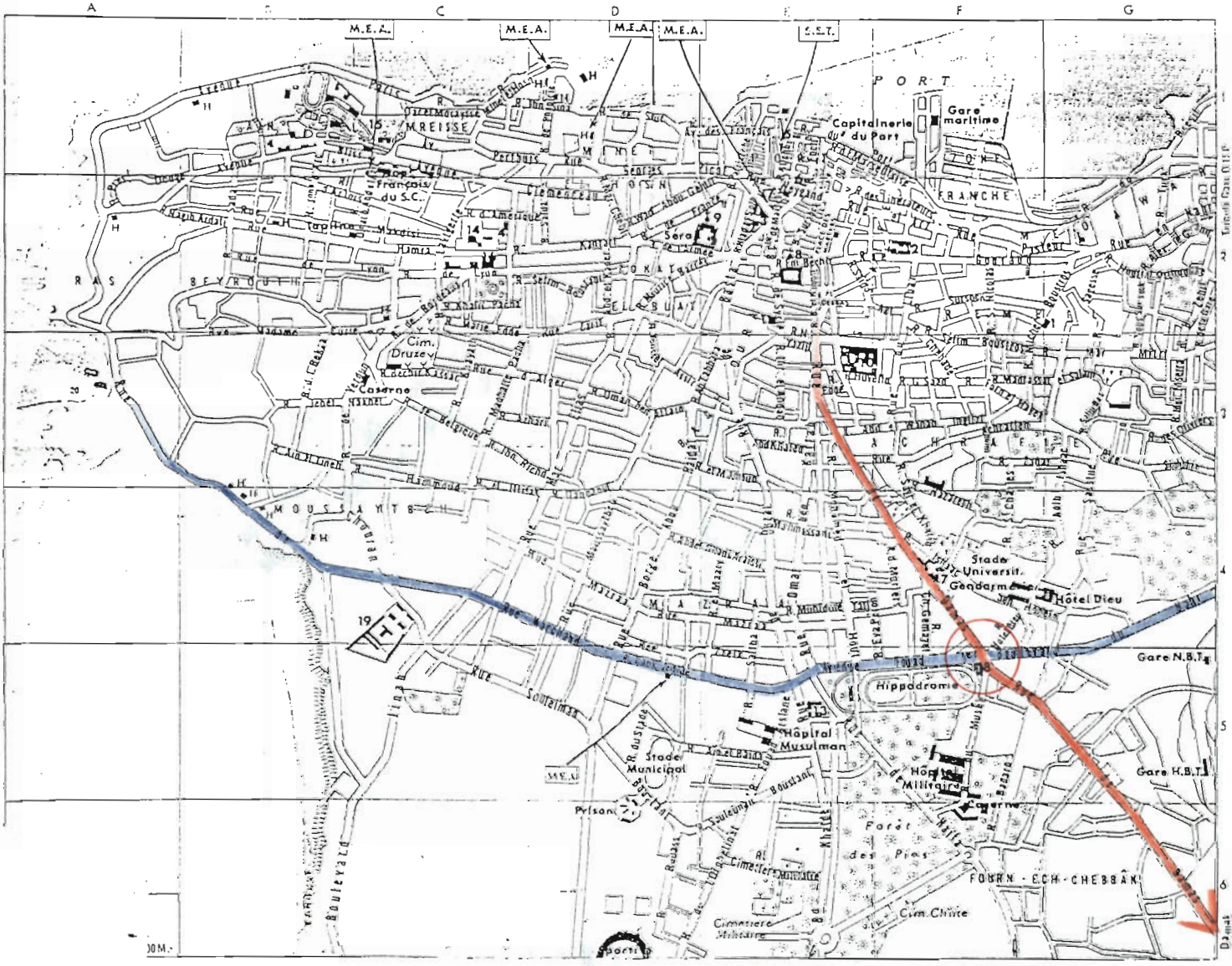
INTERCITY ARTERY (BEIRUT_DAMASCUS).

INTERDISTRICT ARTERY.

ACCESSIBILITY

CIRCULATION ACCESSIBILITY

Vehicular

Pedestian

Bus stop

Road that is not yet
existant

The project relies more on
vehicular accessibility
from the different areas
of Beirut, rather than
pedestrian filtration from
the local neighborhoods.

3. Legal constraints

The site chosen lies in the zone four of Beirut Municipal City Planning Code.
The building codes for that zone are the following:
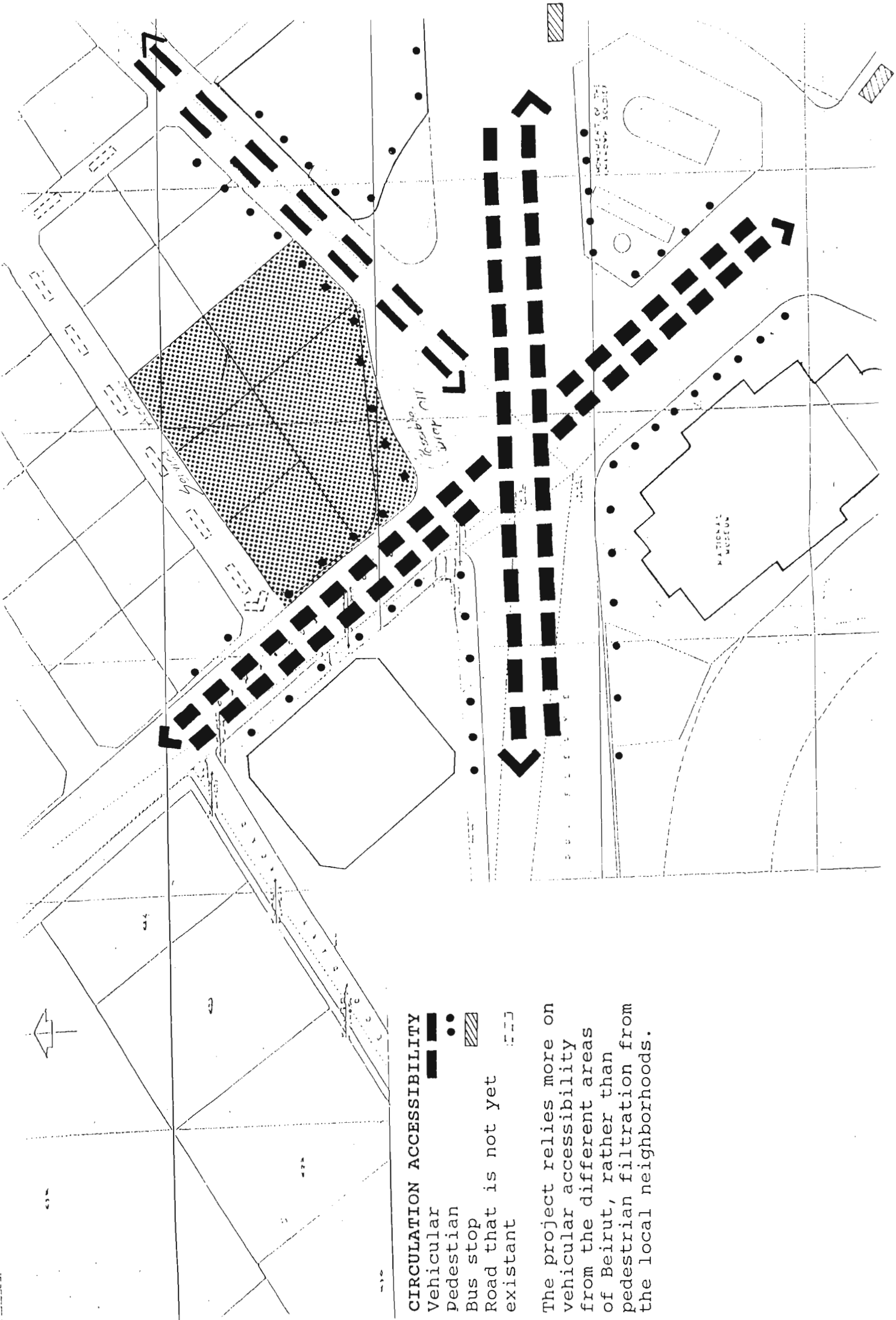 - It has a surface exploitation of 50%.
  - The Floor Allowable Ratio, F.A.R. is 3.5.
  - Set back requirements are 4 meters from main roads, and 3 meters from
secondary roads, 4.5 meters from neighboring sites.
  - Height limitations: 36 meters.
The total area of the site is 2412 sq. meters. According to the building law, the
total built-up area is 8442 sq. meters.

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BEIRUT'S DEVELOPMENT
IN STAGES
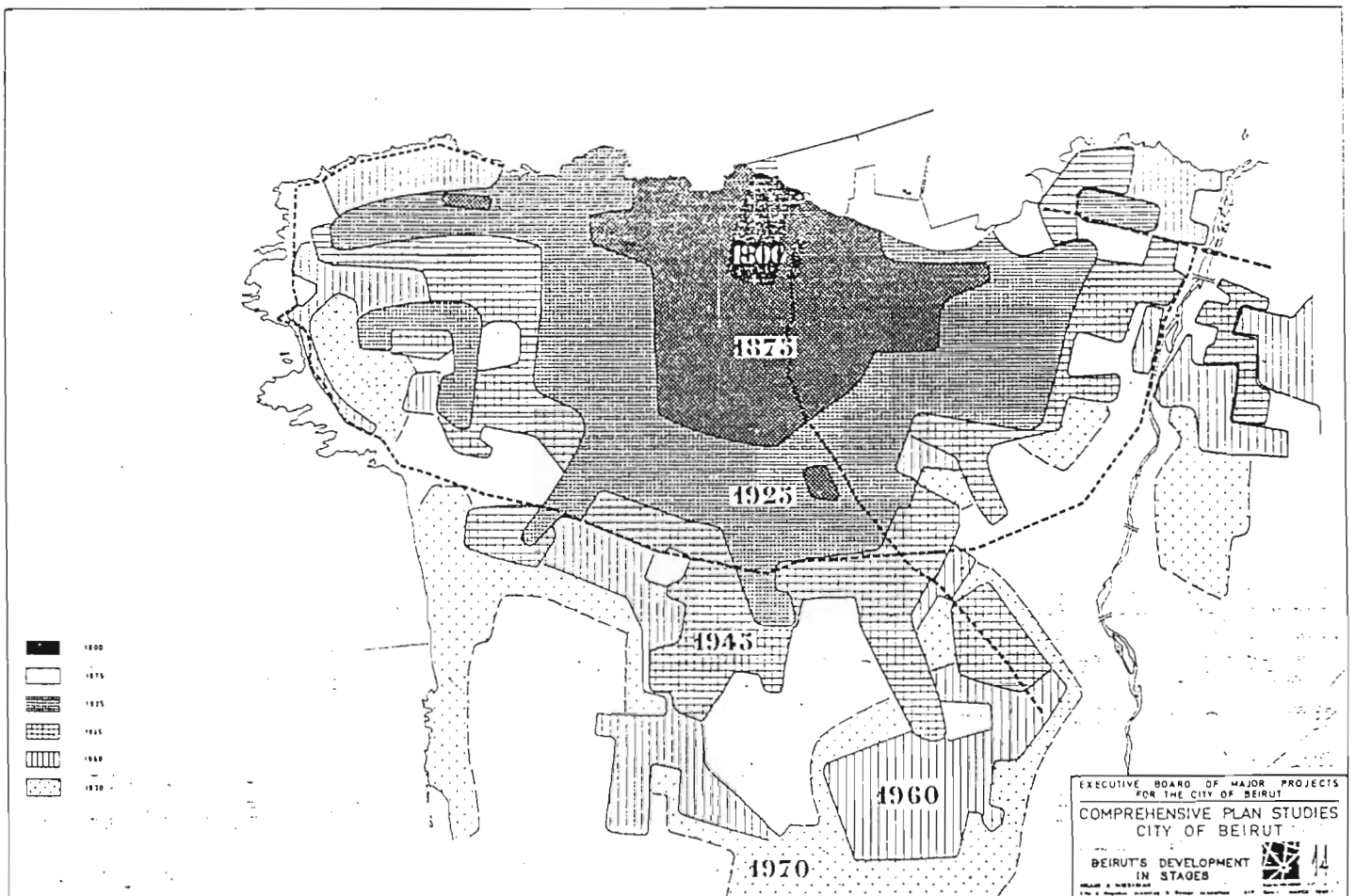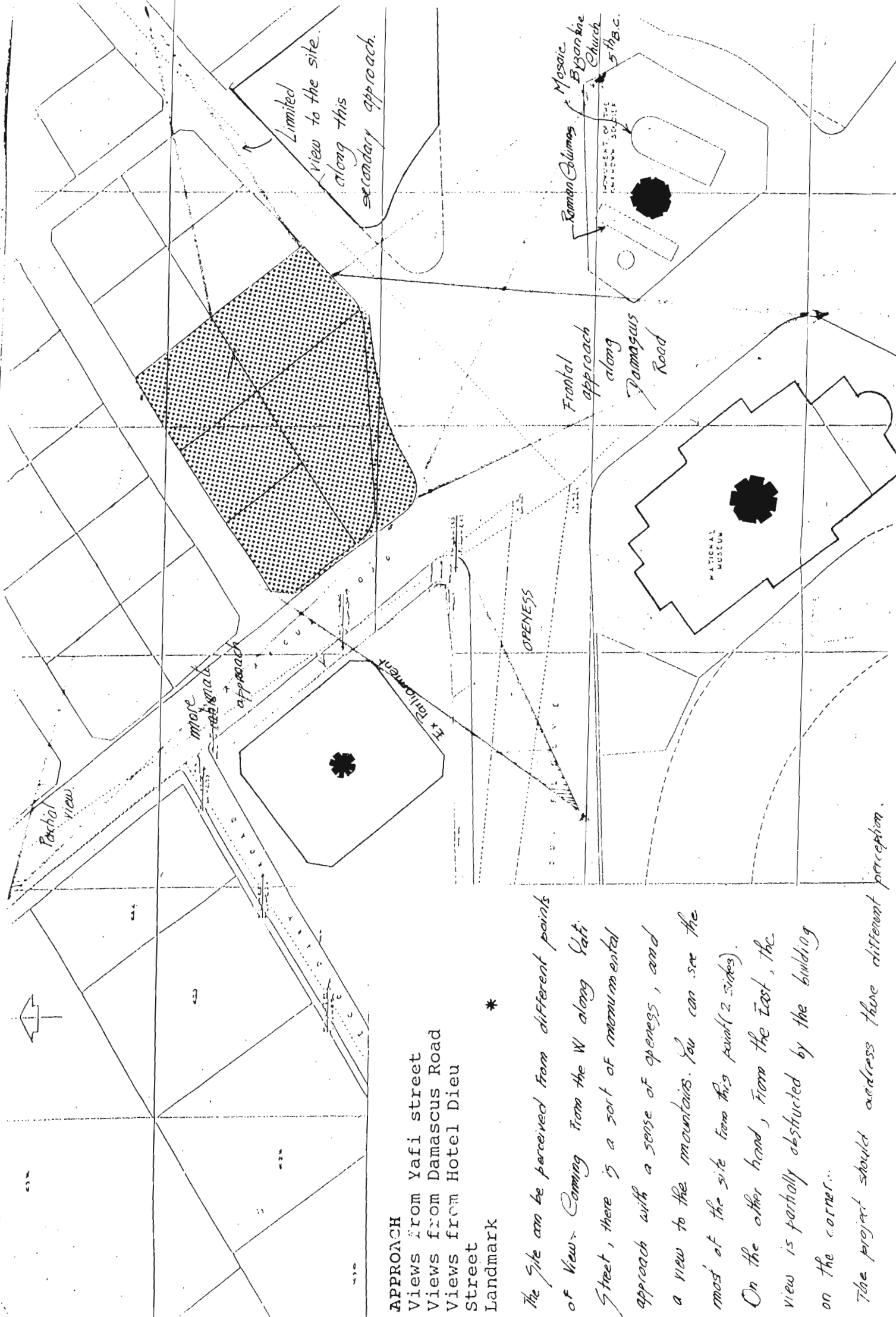
APPROACH
Views from Yafi street
Views from Damascus Road
Views from Hotel Dieu
Street
Landmark   ✳

The Site can be perceived from different points
of Views. Coming from the W along Yafi
Street, there is a sort of monumental
approach with a sense of openess, and
a view to the mountains. You can see the
most of the site from this point (2 sides).
On the other hand, from the East, the
view is partially obstructed by the building
on the corner.

The project should address these different perception.

(labels on drawing) Limited view to the site along this secondary approach. — Roman Columns — Mosaic — Byzantine Church — Frontal approach along Damascus Road — OPENESS — NATIONAL MUSEUM — Ex railway alignment — more intimate approach — Partial view

4. Architectural character and historical background

Along Damascus Road

As shown by its name, the Damascus road ties Beirut to Damascus. The section of the road to Damascus which passes between the two hills of Basta and Achrafieh, was the first carriage way in Beirut. The connection to Damascus was completed in 1863 by a French company, the Societe Imperiale Ottomane de la Route de Beyrouth a Damas. This section of the city mainly developed from the end of the last century till World War two.

The **French School of Medicine**, which is a part of the St. Joseph University founded in 1875 by the Jesuit fathers, is built in 1912 with sandstone, in the French Mandate style.
Facing the FFM (Faculte Francaise de Medecine), is the Greek Catholic Arch bishopric.
To the right of the French Medical school are the convent and girls' school of **Notre Dame of Nazareth.** Not far from it, the **College Laique Francais** opened its school buildings in 1922.
The **French cultural center** has also its quarters along this road.
Behind the French school of medicine, the Maronite, Jewish and Protestant cemeteries used to mark the edge of the town.

Built in 1930 the **National Museum**, with its yellow stone facing and Egyptian style columns, welcomed its collection in 1942.
Originating from the Roman basilica of Berytus, four Roman columns with Corinthian capitals known as the **Berenice colonnade** stand, facing the Museum. This colonnade constitutes a background to the monument of the **Unknown Soldier**.
A mosaic that belonged to a Byzantine church (fifth century) is exhibited behind the colonnade.

Also along Damascus Road is the Syriac Catholic Patriarch, built in the beginning of the century.

· In the Southern part of it, the Damascus road stretches into a more residential area.

As shown, the Damascus road is charged with many lot cultural and religious institutions.
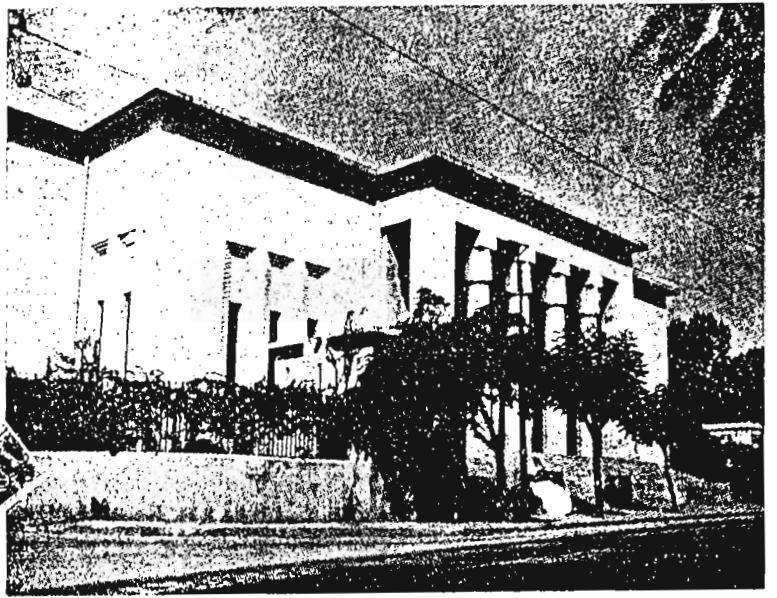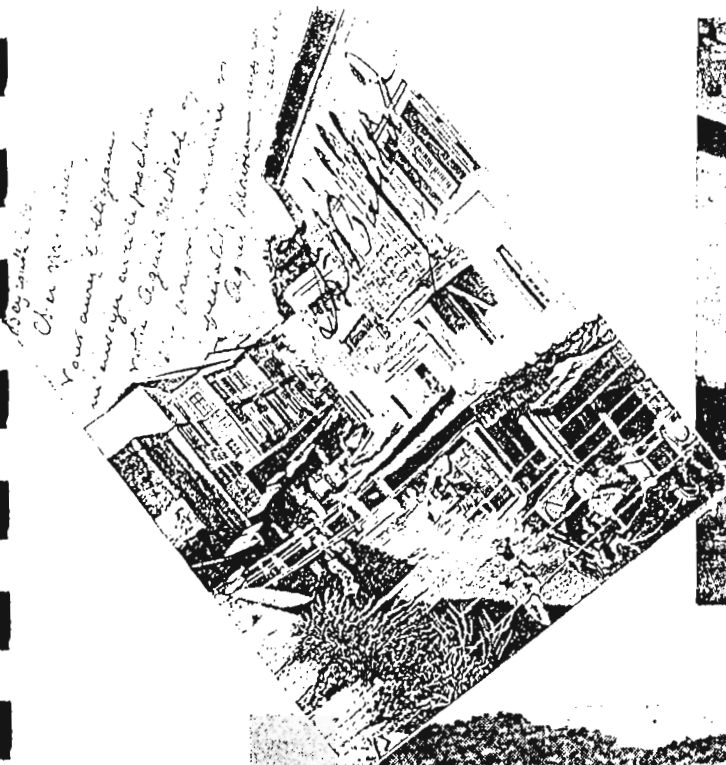
10 BEYROUTH. — L'École de Médecine — L.
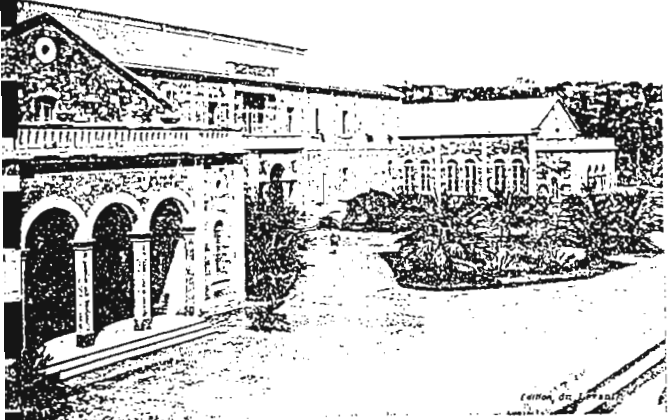
ard of the French Medical Faculty.

Along Yafi Avenue

Next to the Museum lies the Hippodrome and the **Pine Forest**. Emir Fakheddine (16 Th. century) planted most of the trees in this forest to protect the city from the invading sand dunes. In the Park lies the old residence which the French high commissioners used to occupy between 1922 and 1945. In 1921, the Beirut race course was opened on the site.

Facing the museum across Yafi Avenue (known also as Fouad 1 Avenue) is the ex-Parliament building, now the Accounting Department. The Notre Dame du Musee cathedral and its school face the Yafi avenue.
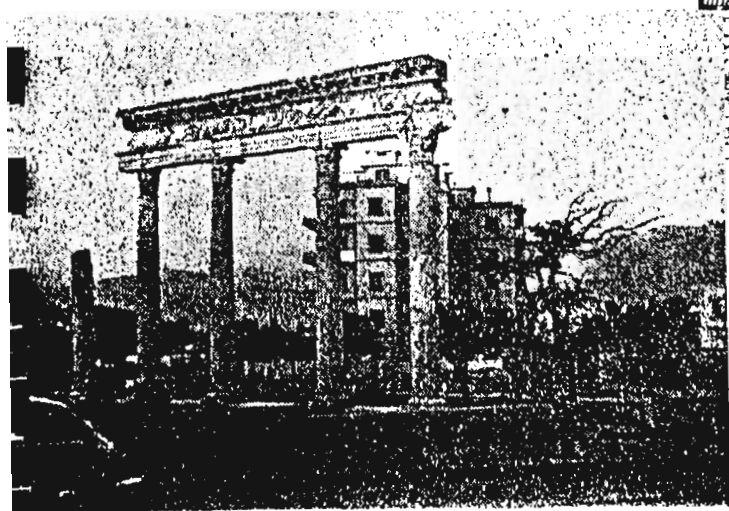Many institutional buildings are along this Avenue: **the Palace of Justice**, the **Military court,** and the **Mansouri Palace** which used to host the Chamber, giving the Yafi avenue its monumental character. It is along this avenue, that every year the parade of the army occurs on the Independence day.

As shown in this paragraph, the museum area is rich in monuments and landmarks with national and cultural significance. It offers a variety of functions ranging from residential, cultural, educational, religious to governmental. The architectural style witnessed in this area encompasses French Mandate style, 60's and 70's buildings as well as Modern structures. The development of this area froze during the war period especially that it used to be one of the demarcating lines. Now, with the advent of peace and reconstruction, this area is coming back to life and it seems to be promising to play once again an important role in Beirut .
Moreover, a project inserted in this node with the already existing three monuments would complete it and reinforce its importance.

3. Beyrouth — Ecole Laïque

The facade of the Lycee Francais et b
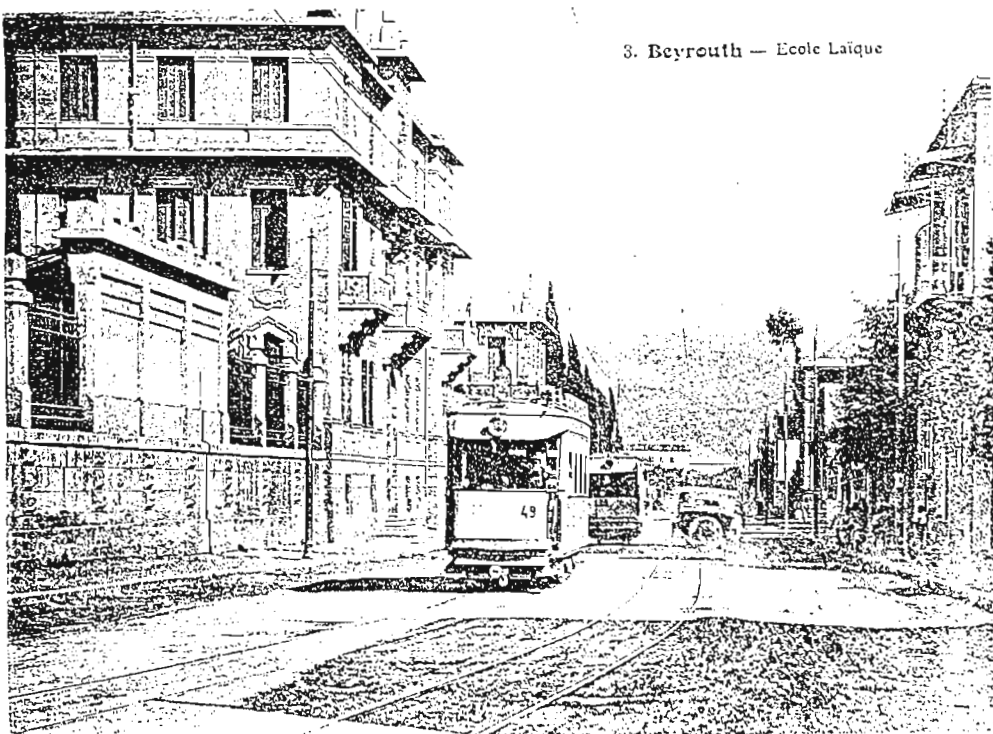
حشود من الدبابات الإسرائيلية على محور المتحف ـ البربير
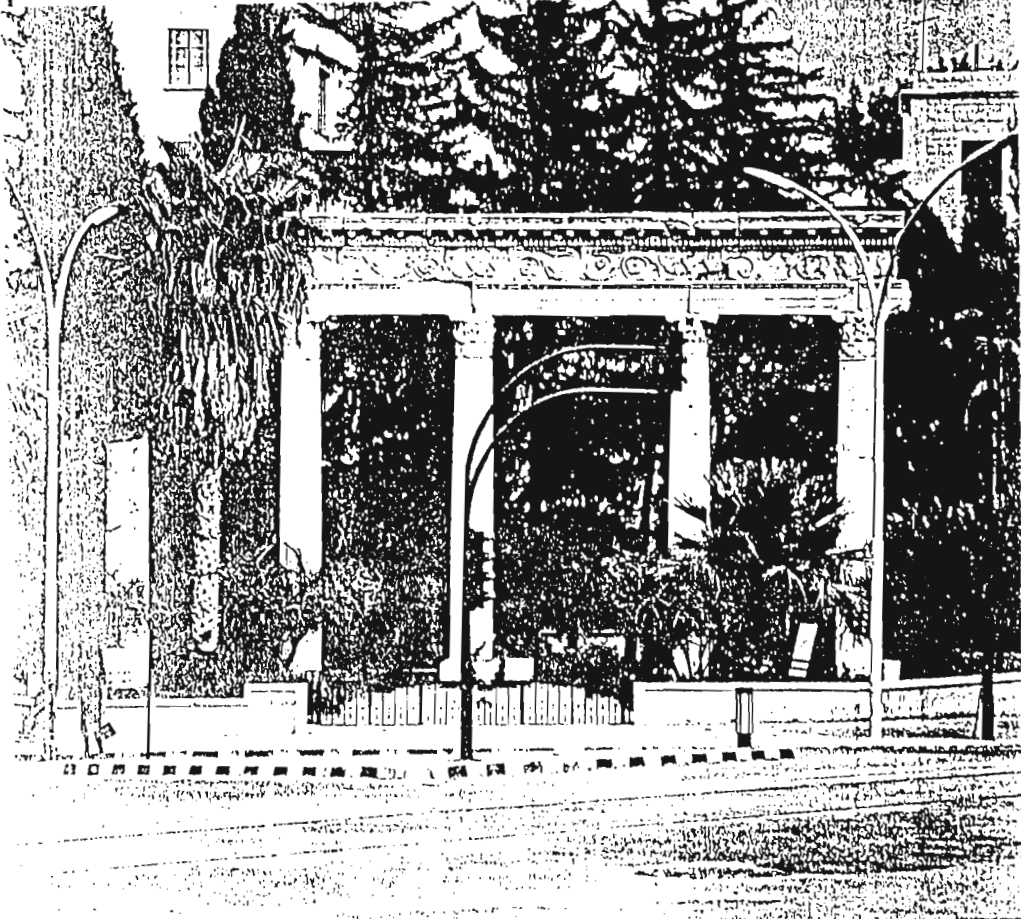
6. Topography

The site is nearly flat with a gentle slope having a difference in level of 1.6 meters in the north south direction. Thus, topography will not constitute a major constraint for the shaping of the project.
 It is at a level of approximately 40 meters above sea level. It is at the edge of mount Achrafieh.

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TOPOGRAPHY   6
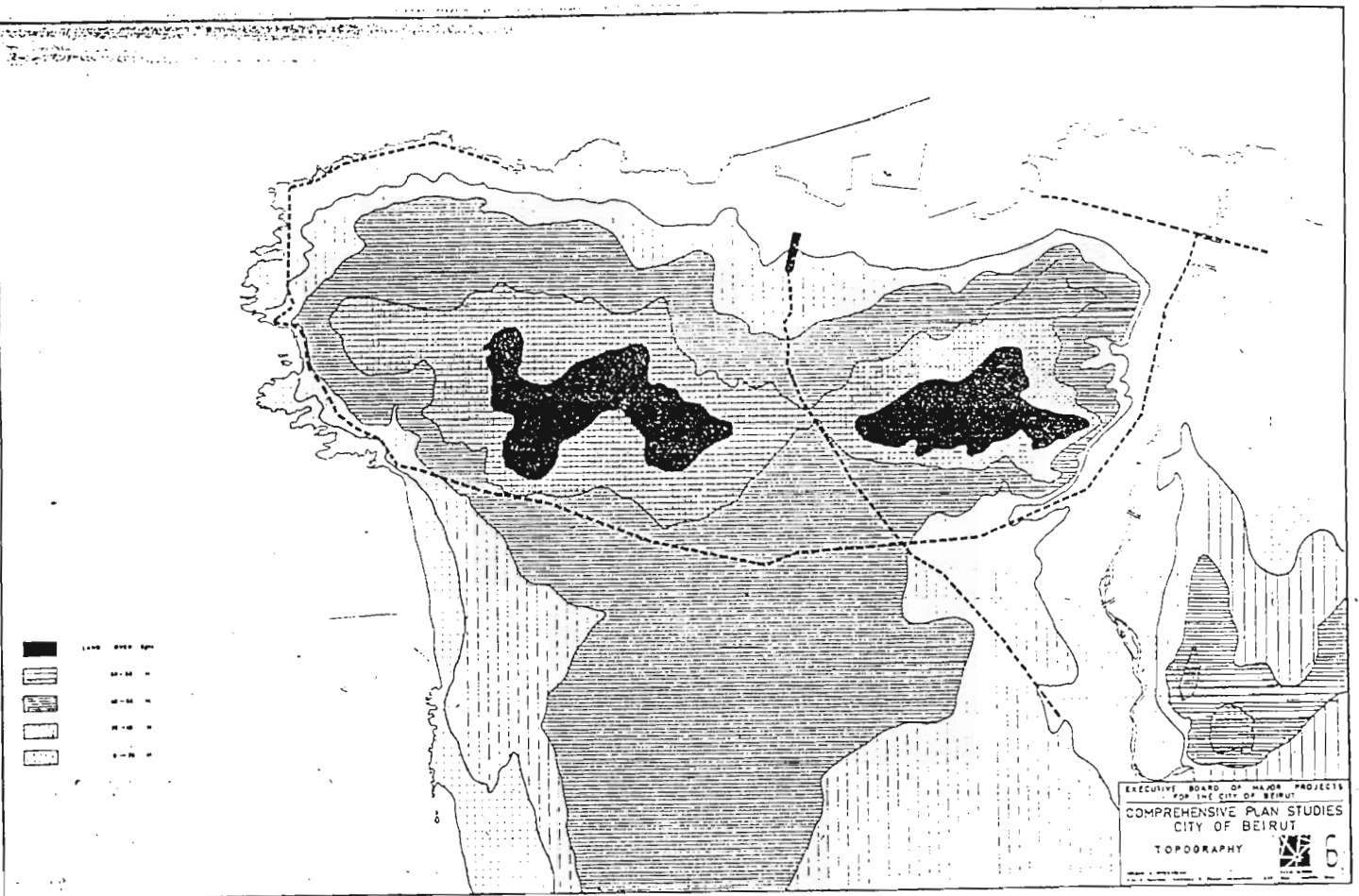
7. Climate

- Temperature: The mediterranean climate offers mild winters and hot summers in Beirut. Daily temperature ranges from 32 C in July to 16 C in January and might reach 40 C in summer and 5 C in winter.

- Wind: The prevailing wind throughout the year is SW to NE. It is usually stronger in the afternoons.

- Sun angle: The sun path diagram for 35 latitude applies to Beirut.

- Relative humidity: high level of humidity especially apparent during summer and ranging between 57 and 87%. Thus, mechanical means will be required to reduce the moisture level to the comfort zone.

It is necessary to provide a system of air conditioning (heating and cooling) to create a comfortable microclimate althrough the year.

The area is most of the time animated with heavy traffic generating noise and fumes. The enclosure of the project ought to deal with this.
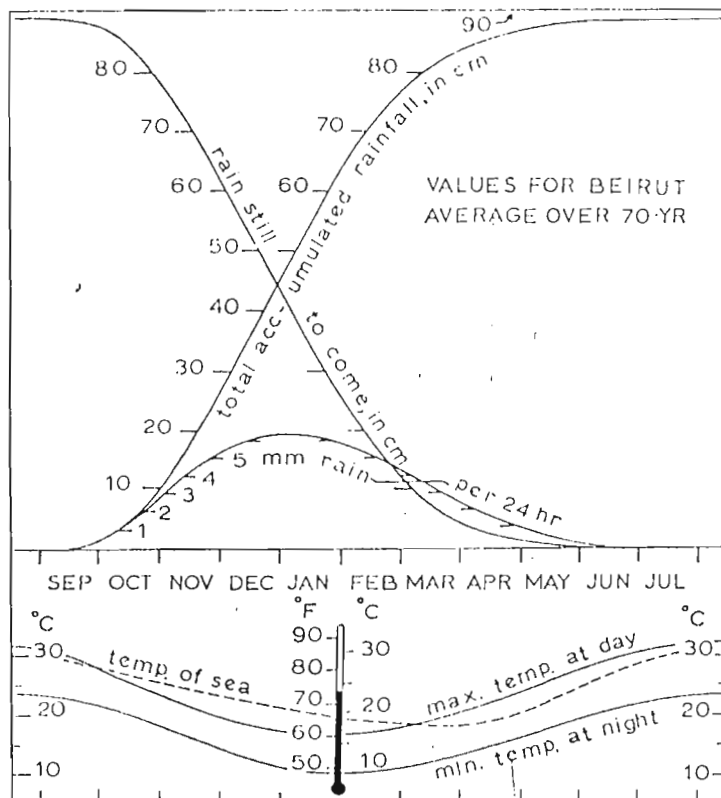
FIGURE No. 2
BEIRUT WEATHER THE YEAR ROUND AT A GLANCE

Library requires
North light for its
reading section

Library

Southern Exposure
could be used for
public plaza

NATIONAL MUSEUM
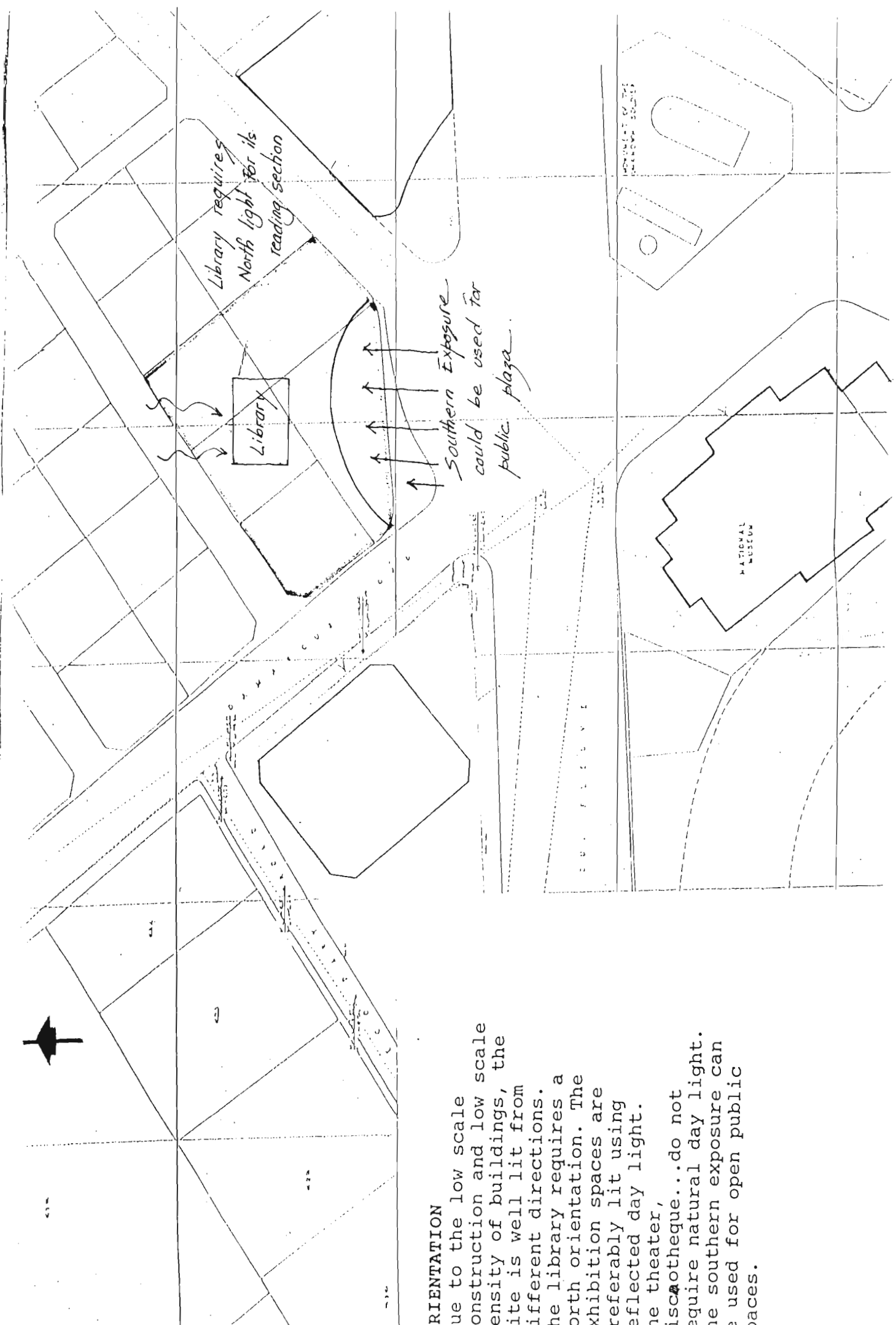
ORIENTATION

Due to the low scale
construction and low scale
density of buildings, the
site is well lit from
different directions. The
The library requires a
North orientation. The
exhibition spaces are
preferably lit using
reflected day light.
The theater,
discotheque...do not
require natural day light.
The southern exposure can
be used for open public
spaces.
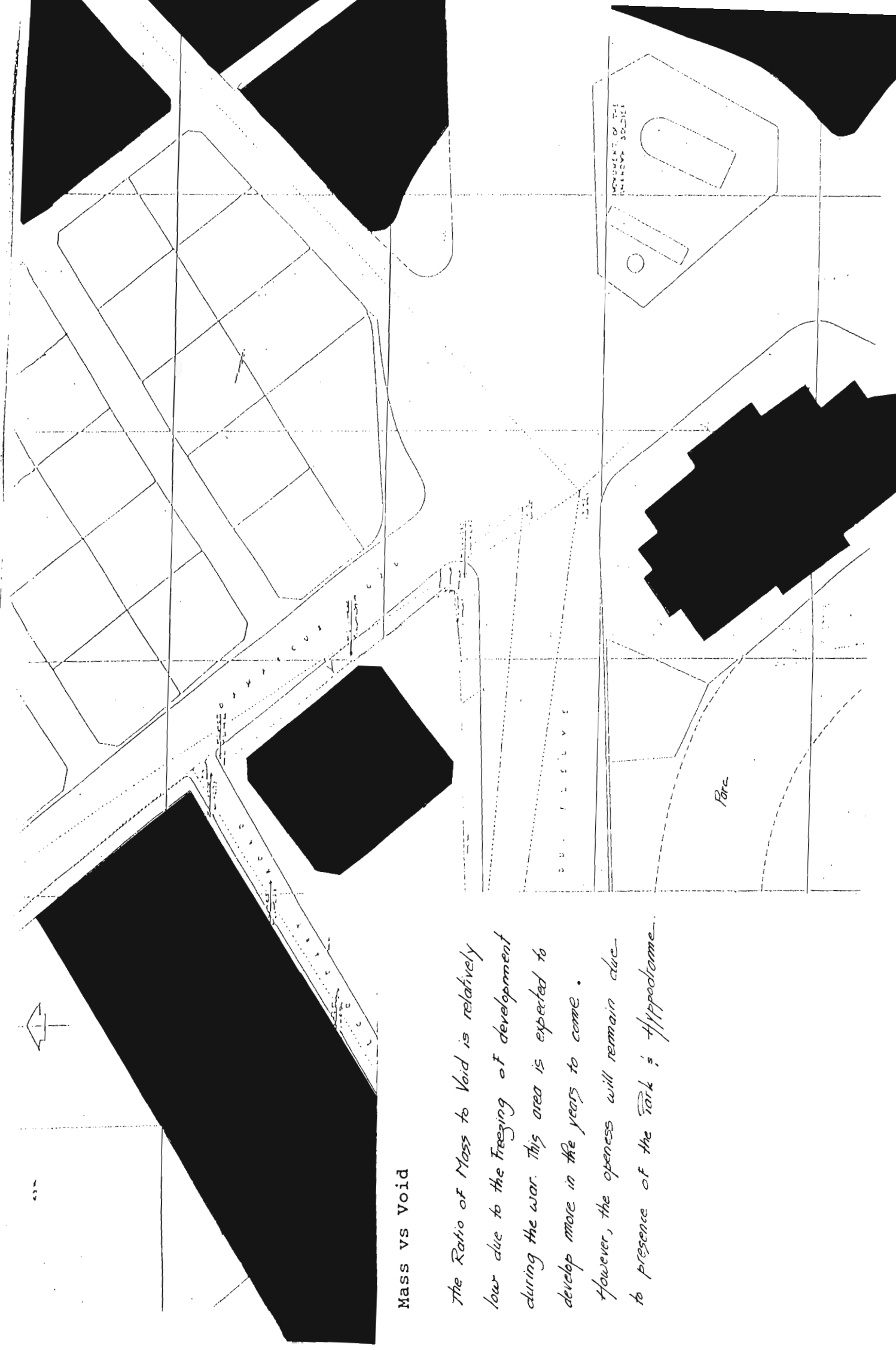
Mass vs Void

The Ratio of Mass to Void is relatively
low due to the freezing of development
during the war. This area is expected to
develop more in the years to come.

However, the openess will remain due
to presence of the Park ; Hyppodrome.

Parc
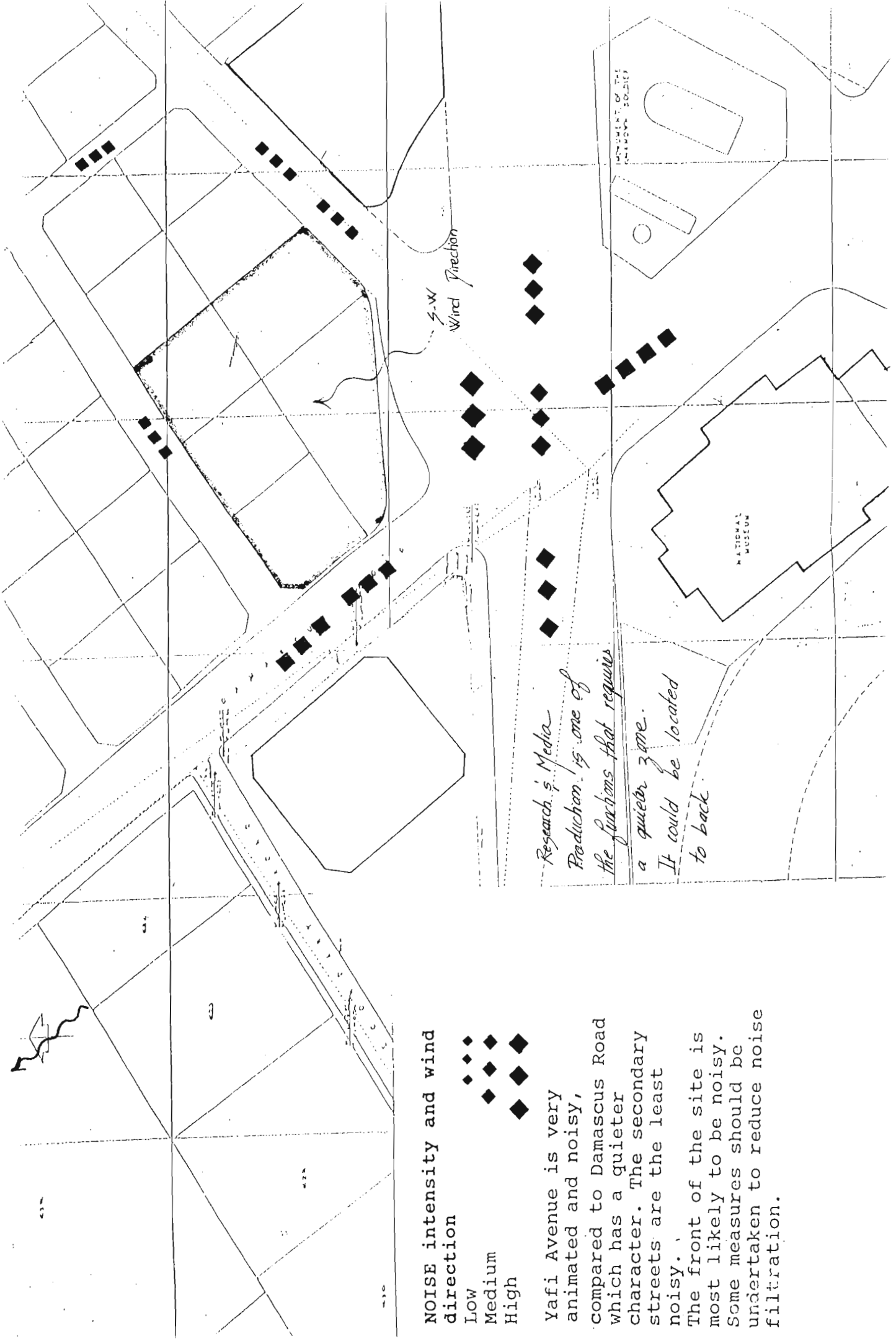
NOISE intensity and wind
direction
Low
Medium
High

Yafi Avenue is very
animated and noisy,

compared to Damascus Road
which has a quieter
character. The secondary
streets are the least
noisy.
The front of the site is
most likely to be noisy.
Some measures should be
undertaken to reduce noise
filtration.

S-W
Wind Direction

Research's Media
Production is one of
the functions that requires
a quieter zone.
It could be located
to back

NATIONAL
MUSEUM
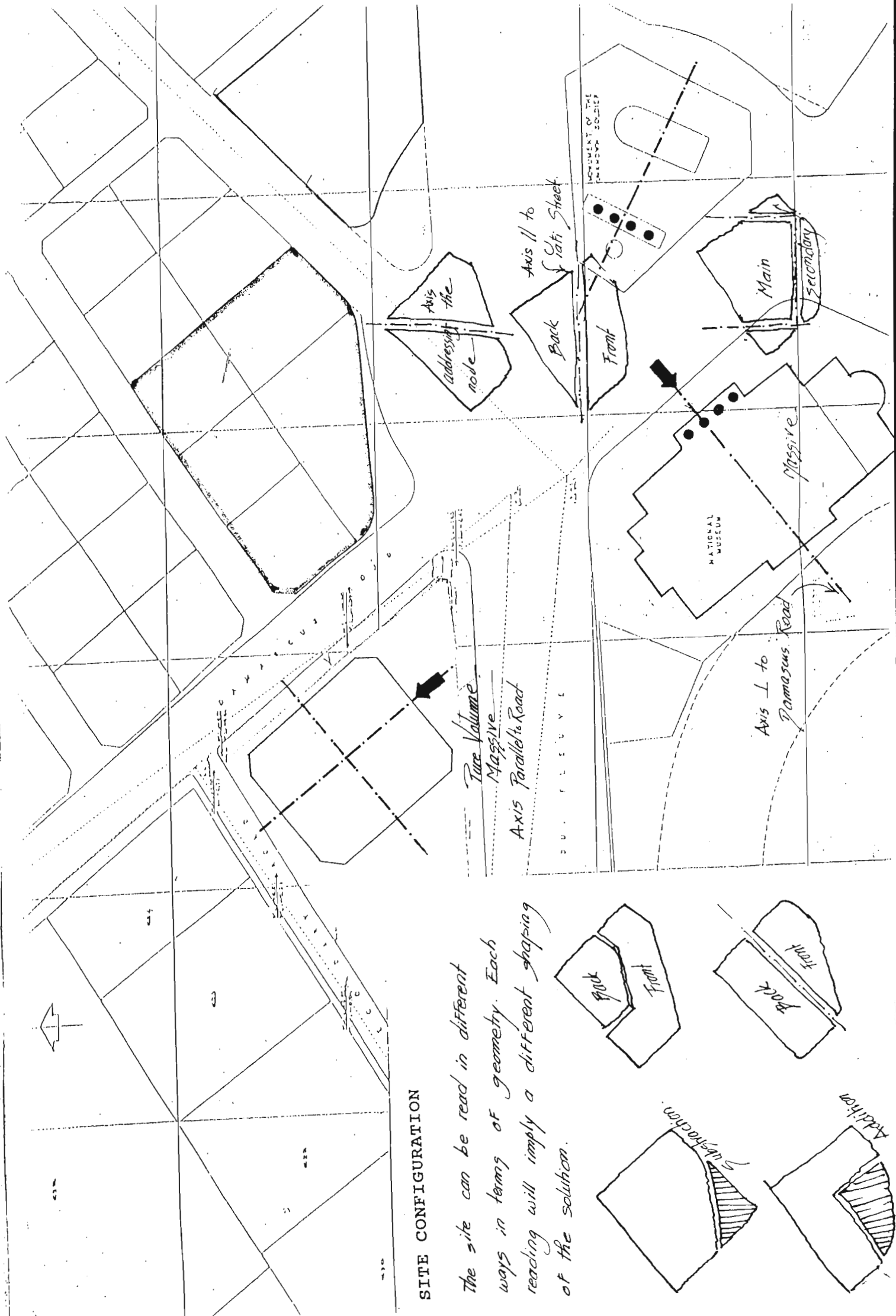
SITE CONFIGURATION

The site can be read in different ways in terms of geometry. Each reading will imply a different shaping of the solution.

Pure Volume

Massive

Axis Parallel to Road

Axis ⊥ to Damascus Road

Axis // to Yafa Street

Axis // to Monument of the Unknown Soldier

addressing the node

Back

Front

Main

Secondary

Massive

NATIONAL MUSEUM

Front

Back

Front

Back

Substraction

Addition
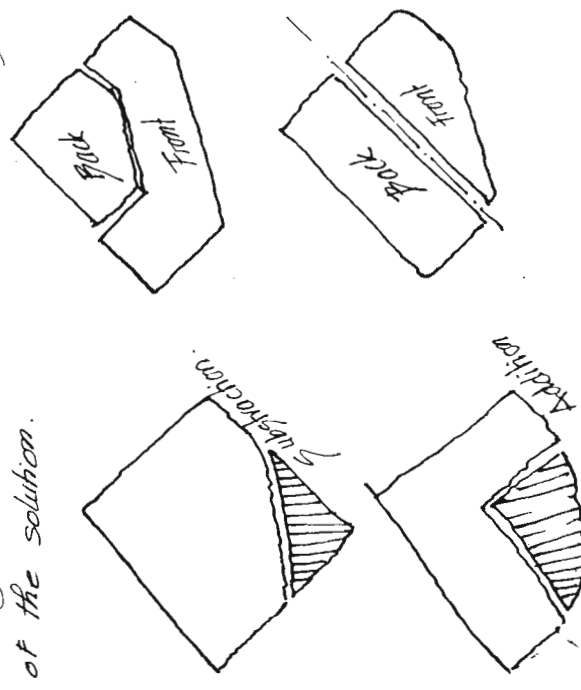
SOME EXPERIMENTATION WITH MASSING
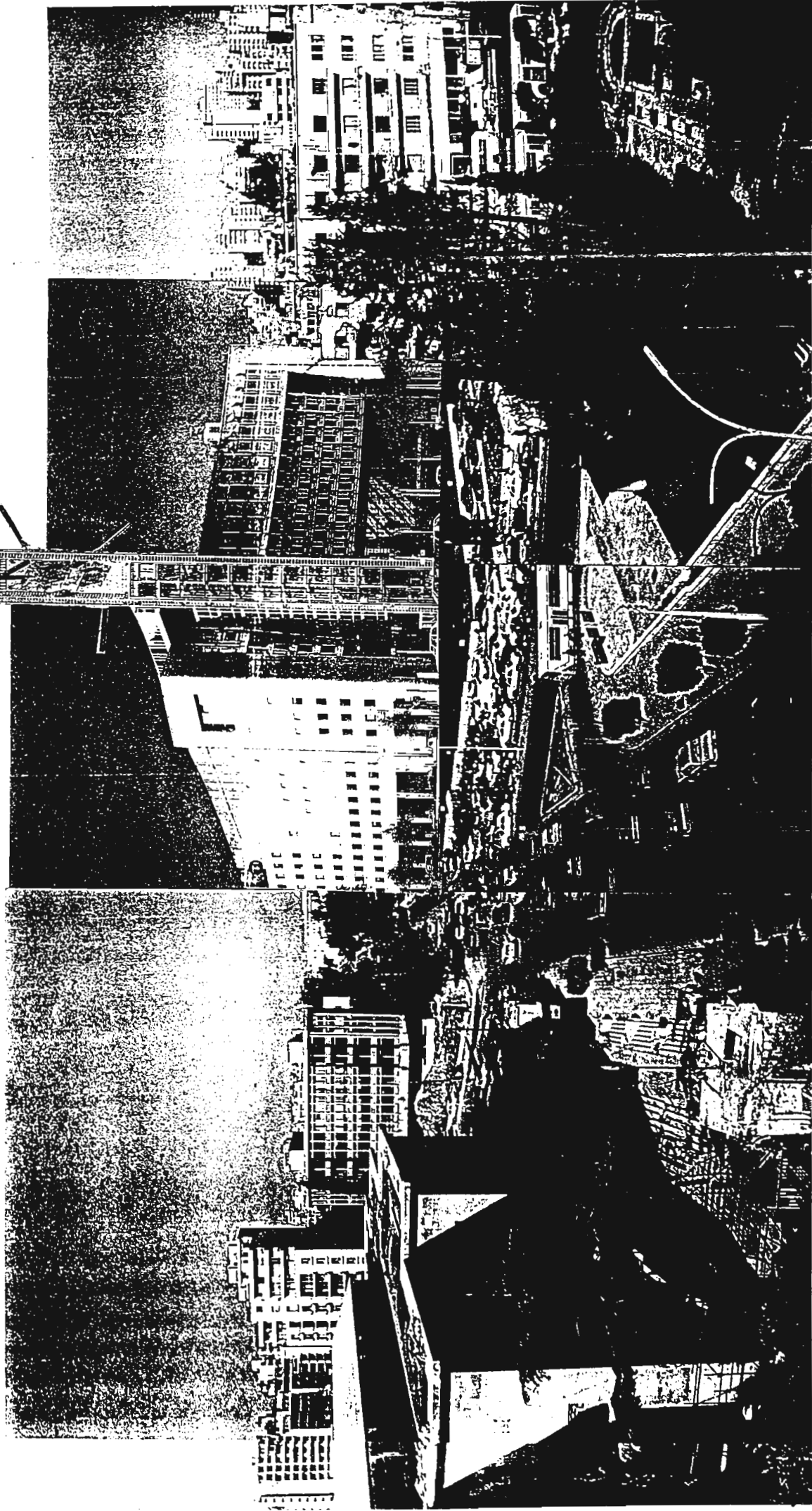
GRAND ECRAN Kenzo Tange
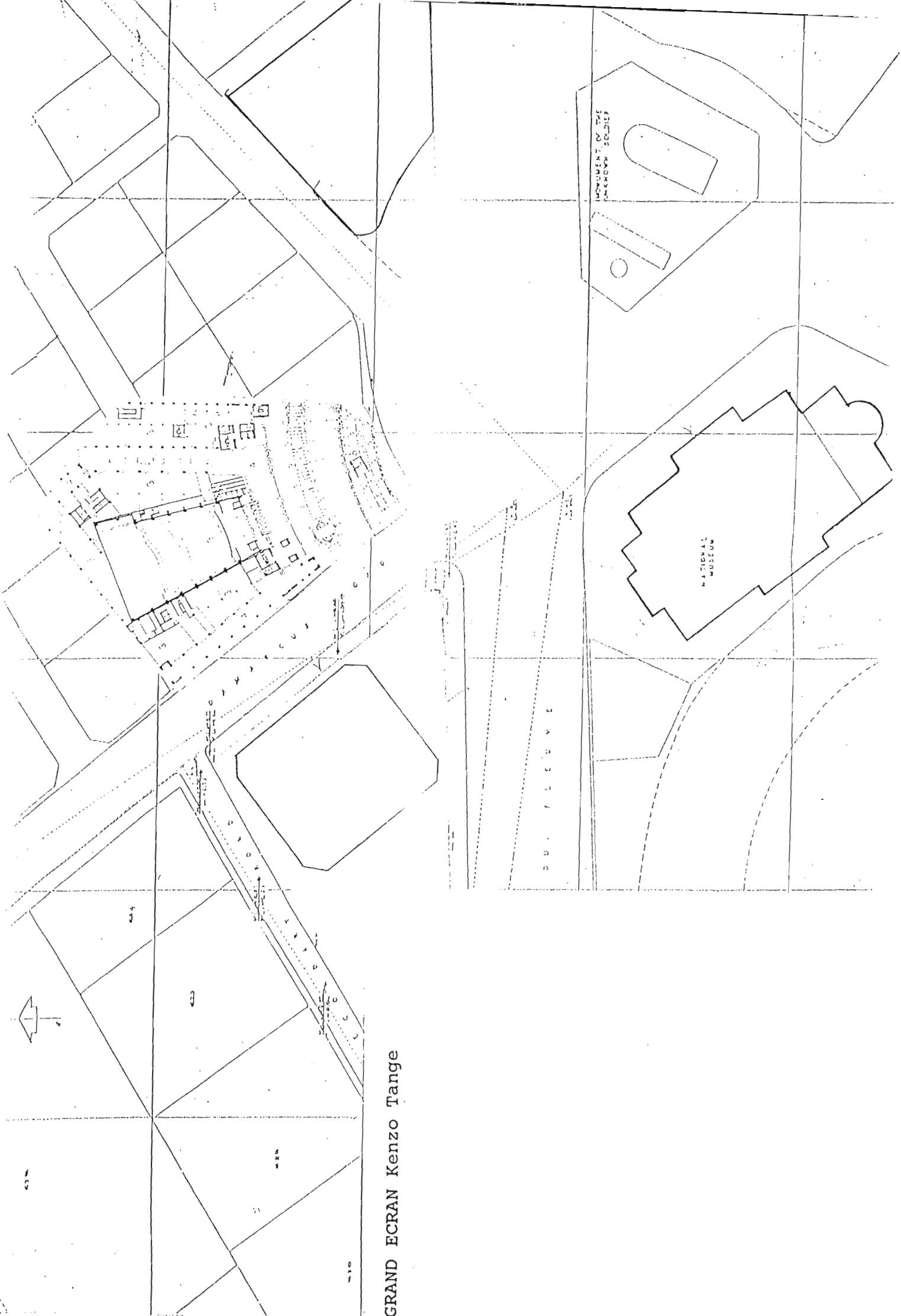
GRAND ECRAN Kenzo Tange
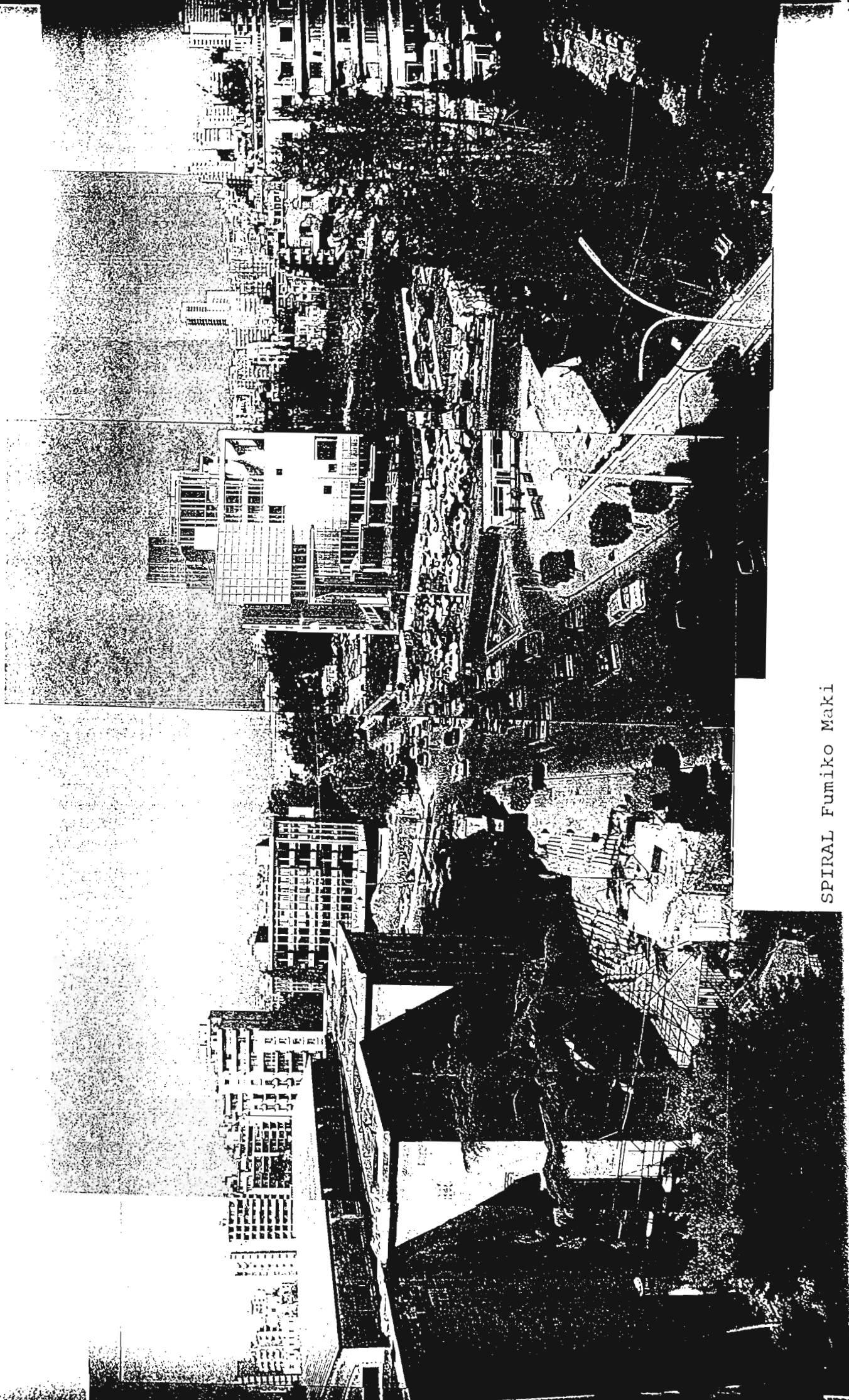
SPIRAL Fumiko Maki
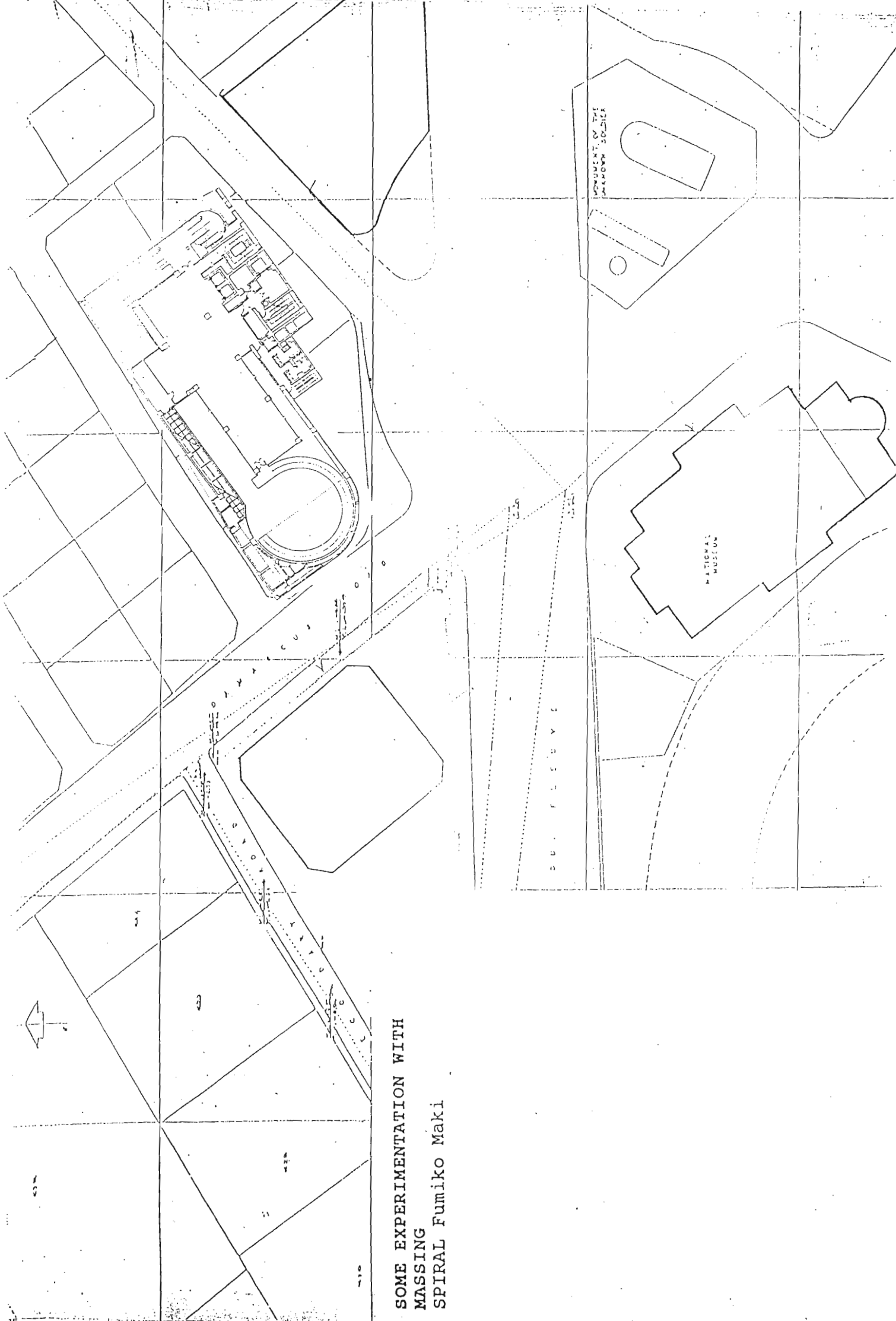
SOME EXPERIMENTATION WITH
MASSING
SPIRAL Fumiko Maki
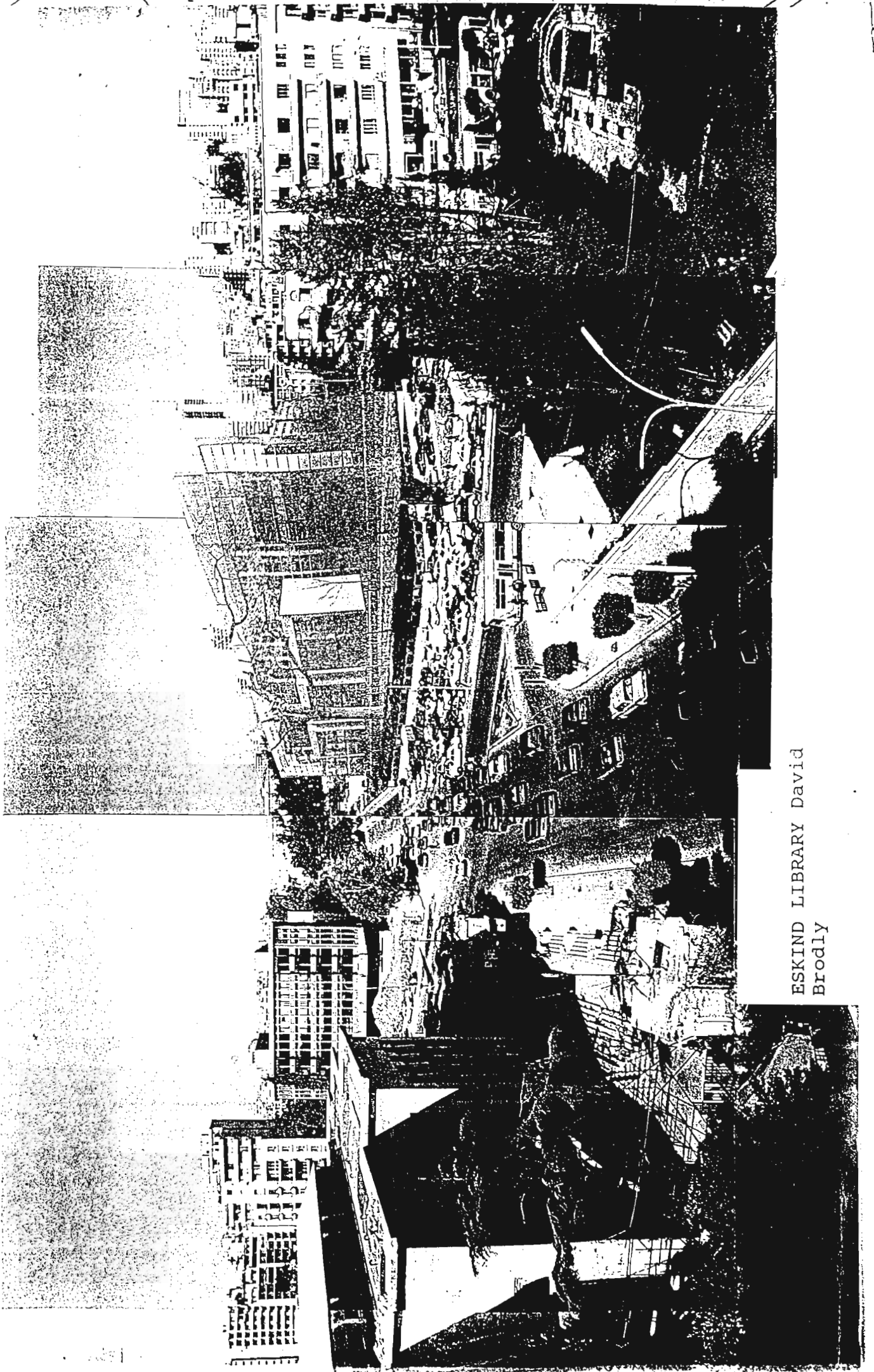
ESKIND LIBRARY David
Brodly

ESKIND LIBRARY David Brodly
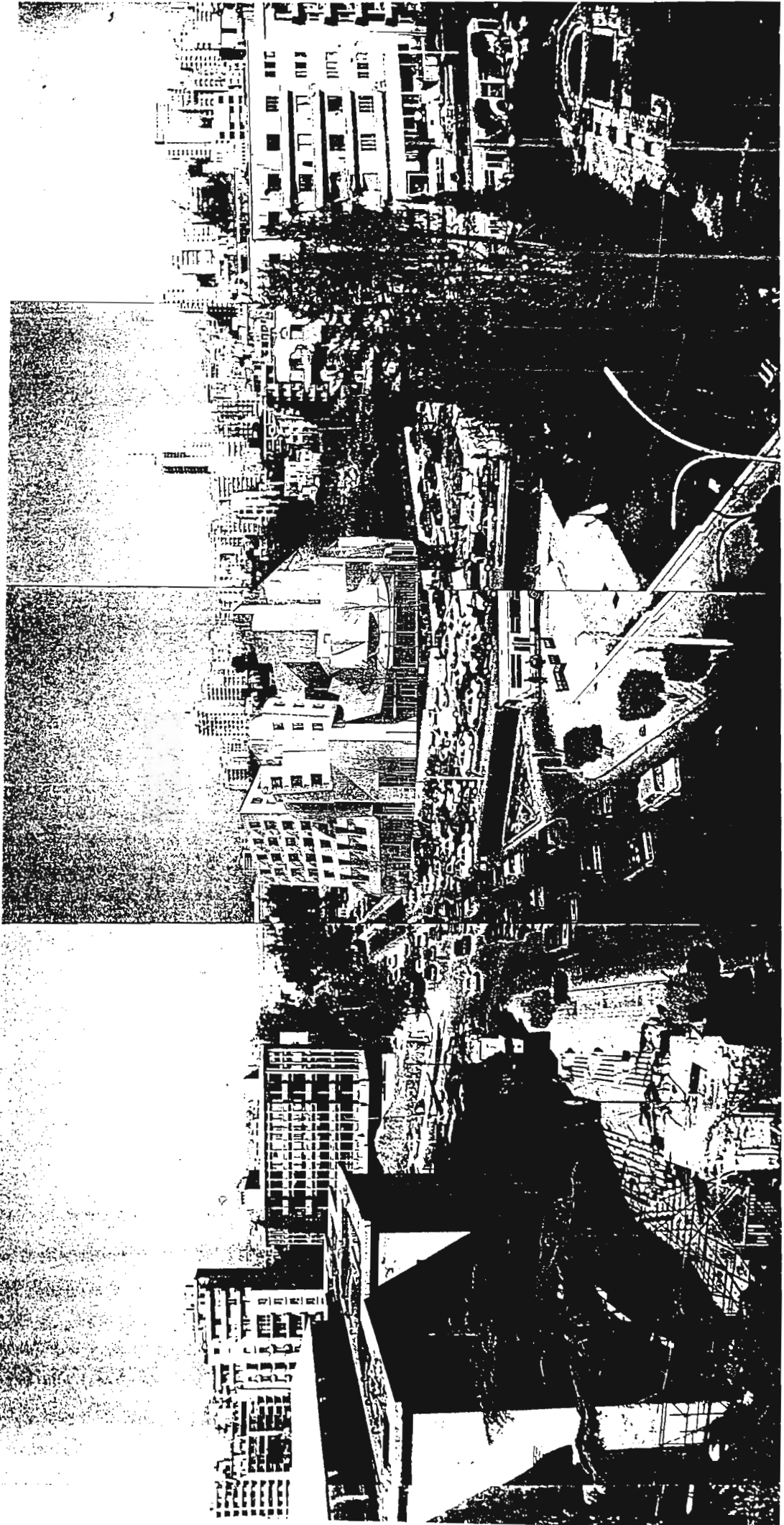
AMERICAN CENTER Frank
Gehry
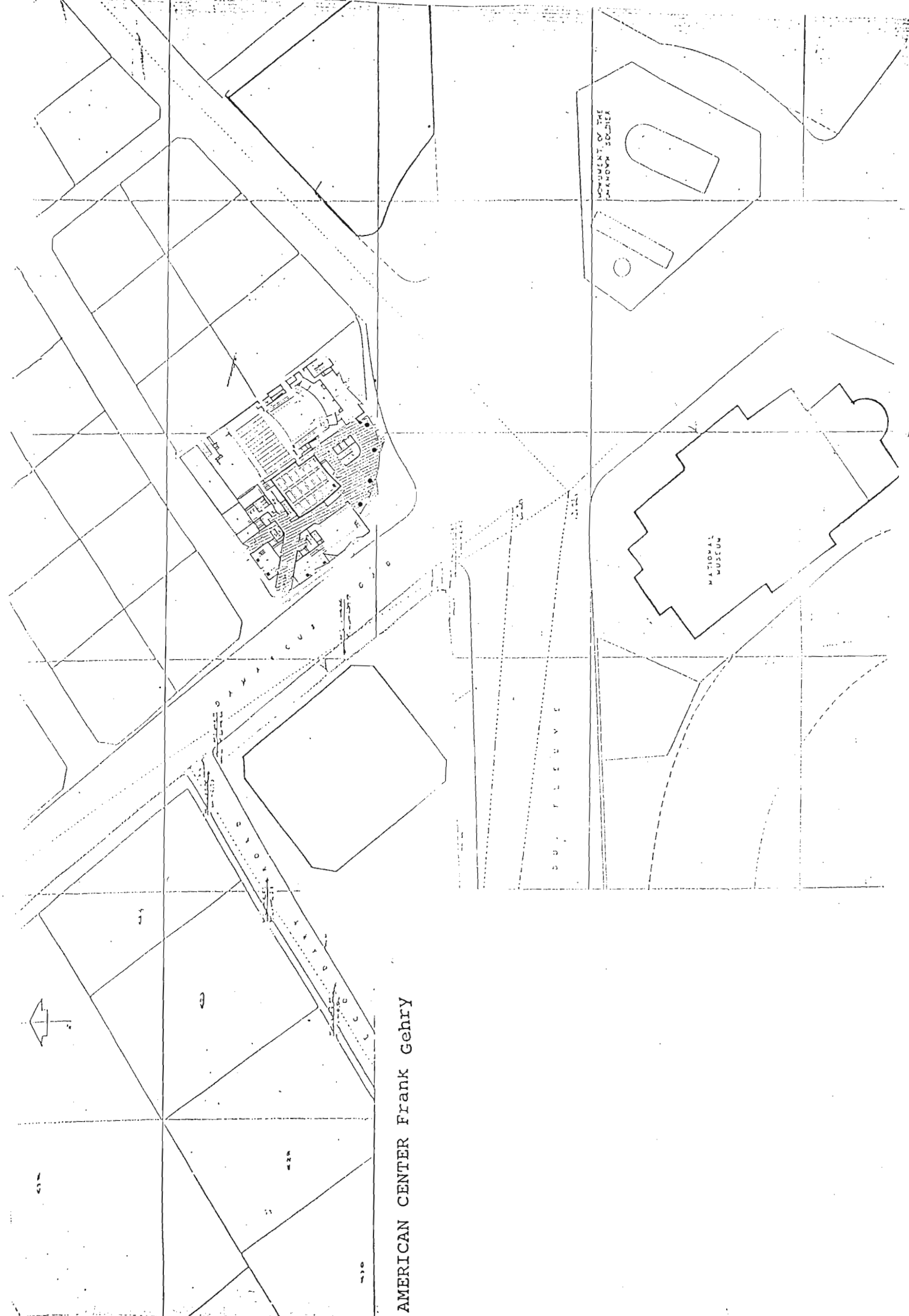
AMERICAN CENTER Frank Gehry

IV. PROGRAM AND
SPACE
REQUIREMENTS
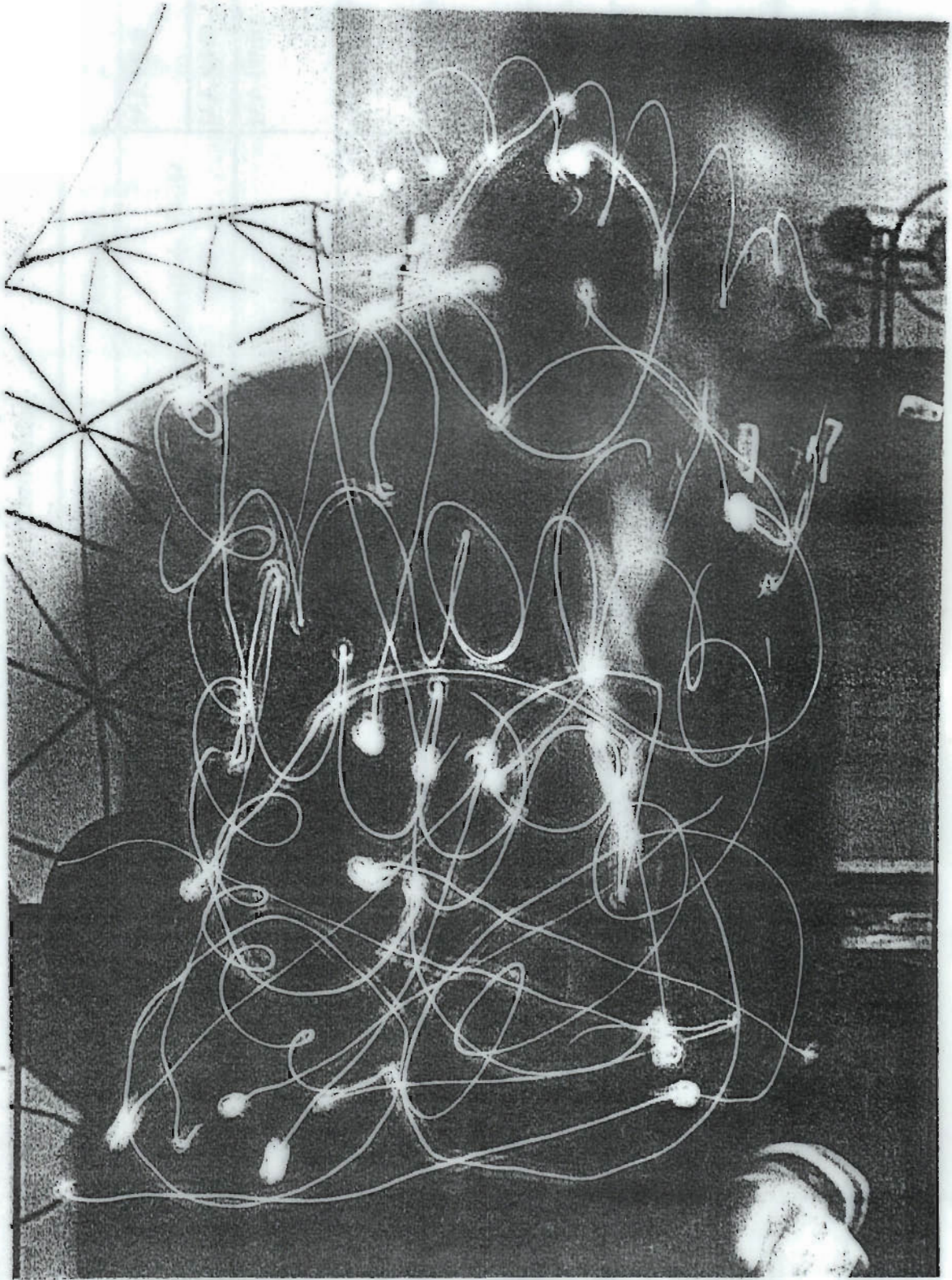
IV. SPACE REQUIREMENTS

1. Area Tabulation

program		NET m2	GROSS m2	percentage
Entrance Hall			400	5.88
	- information hall			
	- ticketing			
	- cloakroom			

* CULTURAL / EDUCATIONAL

		NET m2	GROSS m2	percentage
Exhibition			875	12.86
	- temporary exhibition	250		
	- media exhibition	500		
	- storage	45		
	- curators office (2)	20		
	- information (2)	15		
	- workshop	45		
Conference / Calssroom			120	1.76
	- conference room	80		
	- classroom	40		
Library			610	8.97
	- stacks (30 000 vol.)	210		
	- circulation desk	20		
	- periodicals / newspaper	50		
	- reading area (75 seats)	225		
	- children section/story telling	60		
	- photocopy (4 machines)	20		
	- card catalogue (90 trays)	15		
	- computer catalogues (3)	10		
Multimedia			737	10.8
	- computer lab (20 terminals)	50		
	- video library (3 000)	25		
	- VCR (10)	100		
	- audio cassettes	20		
	- audio terminals (15)	75		
	- slide library	15		
	- projection rooms (5)	400		
	- microfilms (15)	40		
	- restroom	12		

program	NET m2	GROSS m2	percentage
* COMMERCIAL / RECREATIONAL			
Coffee shop / Restaurant		287	4.22
- seating (150)	225		
- kitchen	50		
- toilets	12		
Discotheque		225	3.30
- bar	75		
- dance floor	80		
- seating (45)	70		
Media theater		480	7.05
- seating (300 p.)	225		
- stage	80		
- storage	20		
- dressing rooms (2)	30		
- projection room	10		
- toilets	12		
- foyer	100		
Cinemania		205	3
- pre-show lobby	50		
- equipment	75		
- hydraulic seats (50)	80		
Retail		325	4.78
- Records tower	250		
- Bookshop/Giftshop	75		
Virtual Reality Display		80	1.18

program	NET m2	GROSS m2	percentage
* ADMINISTRATION			
Management Section		222	3.26
- manager	30		
- secretary/waiting	25		
- conference	40		
- public relations	20		
- accounting	20		
- chief of personnel	20		
- archives	20		
- offices (2)	30		
- toilets	12		
- kitchenette	5		
Library administration		162	2.38
- librarian	25		
- assistant librarian	20		
- acquisitions	20		
- processing	20		
- cataloguing	25		
- office	15		
- binding	25		
- toilets	12		
Research and multimedia production		362	5.32
- recording studio	200		
- darkroom	15		
- equipment storage	50		
- computer lab	85		
- toilets	12		
* SERVICES			
Electromechanical services		280	4.12
- mechanical room	100		
- electricity room	60		
-offices/maintenance	20		
- storage	100		
Circulation		1436	21.12

TOTAL : ~ 6800 sq. m

1. Space Standards

EXHIBITION

"To exhibit means to set out in a coherent way, as in explaining an argument. More simply it means to display things, to offer them to the eye."

There are two types of exhibition spaces included in the project:
- temporary
- permanent

The temporary exhibition space houses the latest developments in the field of traditional media as well as media arts. The diversity of the displays dictates a flexible arrangement of the spaces (200 sq. m).

On the other hand, the permanent exhibition (600 sq. m) displays the history of media. showing the evolution from the classical media to the recent developments of media technology. The displays might include collections about printing, TV. radio. video. computer graphics... Thus. housing reproduction of historical equipment used in the field of media. One part of the exhibition space will be devoted to the future of media and it will be constantly upgraded.
This will offer the opportunity to educate the public about media. by offering an inside look at the ways in which technology has transformed our lives.
Due to its character. the permanent exhibition will have a stable setting.

Lighting

Daylight may come from above or from the side.

Lighting from above

Overhead lighting offers the following advantages:
- it is independent of orientation.
- light is not affected by any obstructions that might cause refraction's or shadows thus altering the quality of light.
- it saves wall space thus freeing more space for exhibits
- light falling on the exhibits can be easily regulated.
- it has little reflection.
- light is more widely spread over the exhibits.
- security measures are facilitated due to fewer openings to the outside.

On the other hand, the disadvantages of this system of lighting are:
- it develops strong heat built-up.
- the risk of damage from water and condensation threatens.
- it allows only diffused light.
- the monotony of lighting.
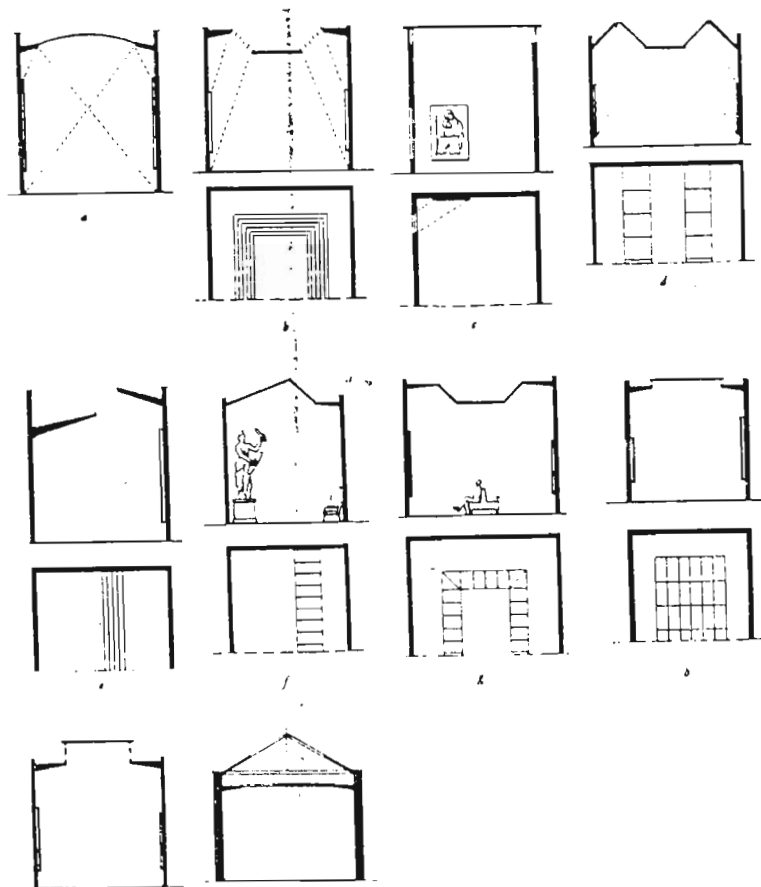
Lateral lighting

The window lighting offers the following advantages:
- it allows a view out if the windows are placed at a low level, which relaxes the viewer.
- the room is easily aired and kept at even temperature.
- it offers better light on groups and individual exhibits.

High placed windows provide more light resembling that of skylights and free the walls for exhibits.

It is necessary to adopt a system that can accommodate different needs and adapt to change.
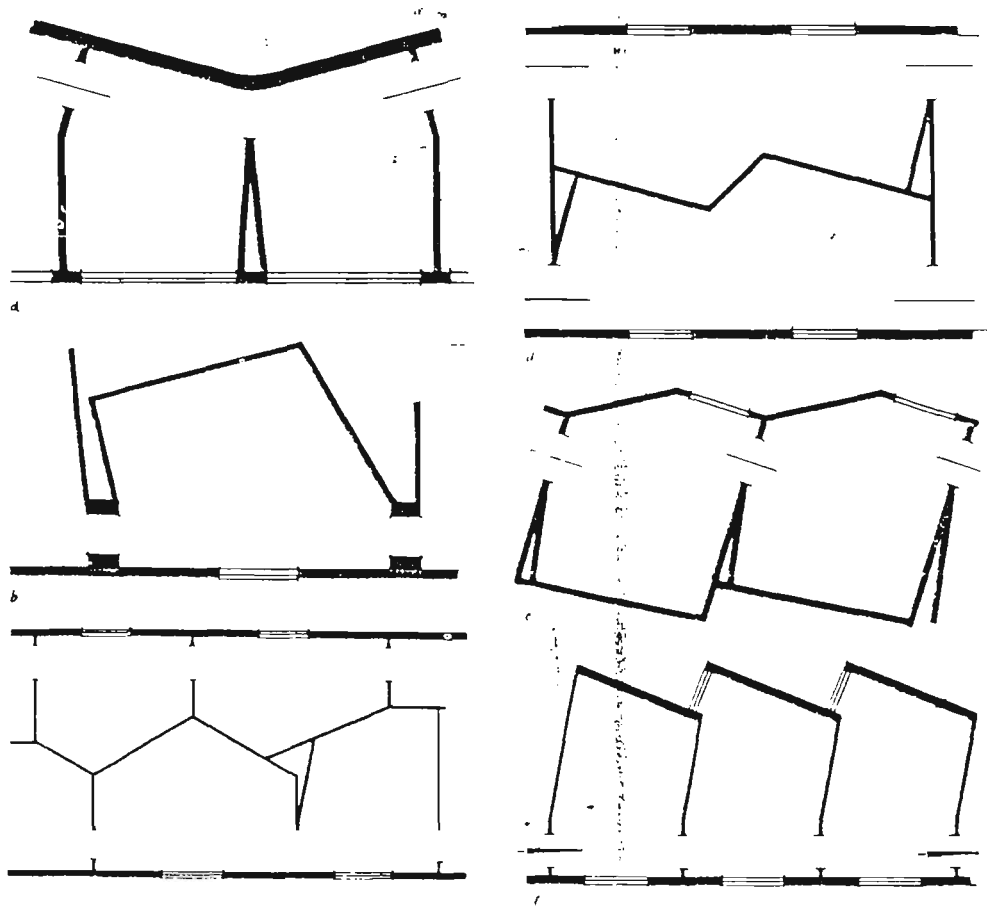
Space division

The tendency is to create large unbroken spaces which can be divided by movable partitions and lightweight structures. Flexibility is the main requirement. so that the interior can be adapted. divided. and altered to meet the varying demands of the successive exhibitions.

Exhibits must be so placed as to be seen without effort; this calls for a selective and spacious arrangement. offering variety and suitable room shapes and sequence.

The circulation patterns within spaces are related to door location. Doors can be placed towards the center or along the periphery.

An information desk is present in each of the two exhibition spaces to assist the visitors as well as control. A storage area will serve the exhibits.
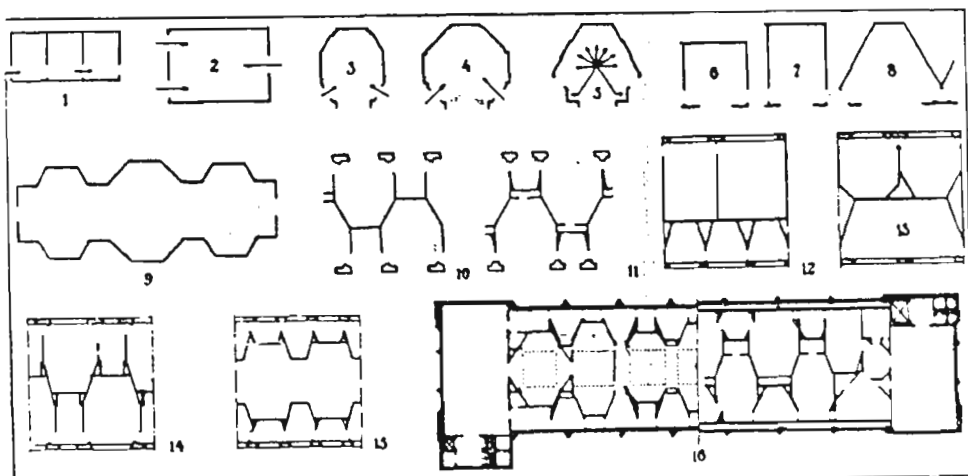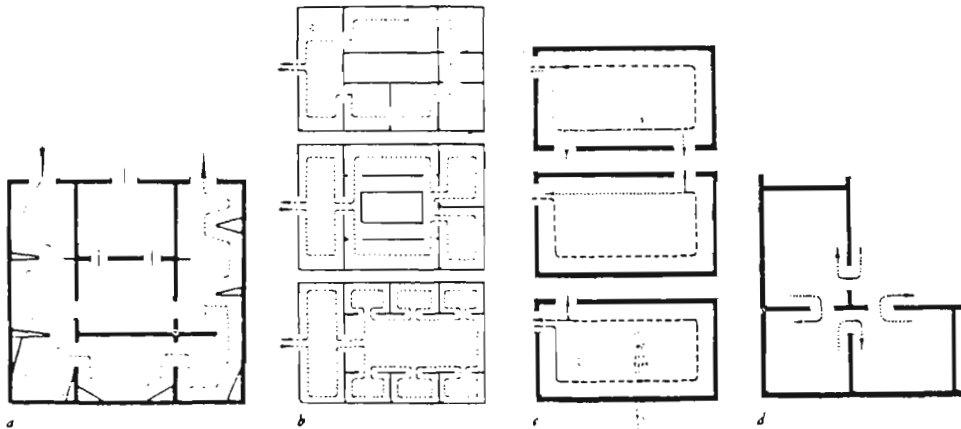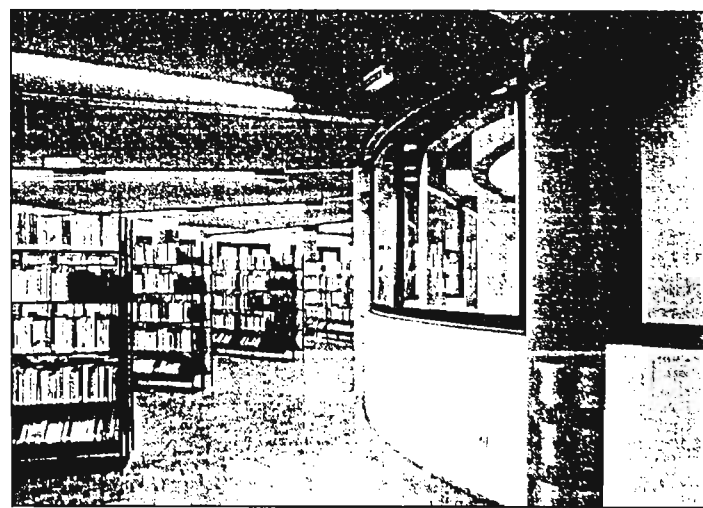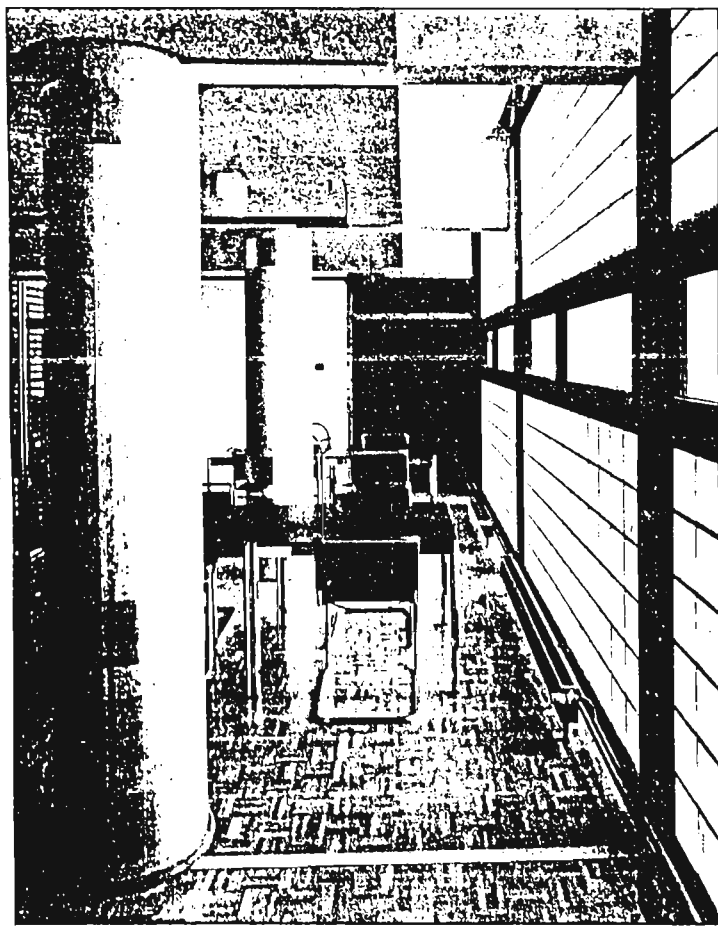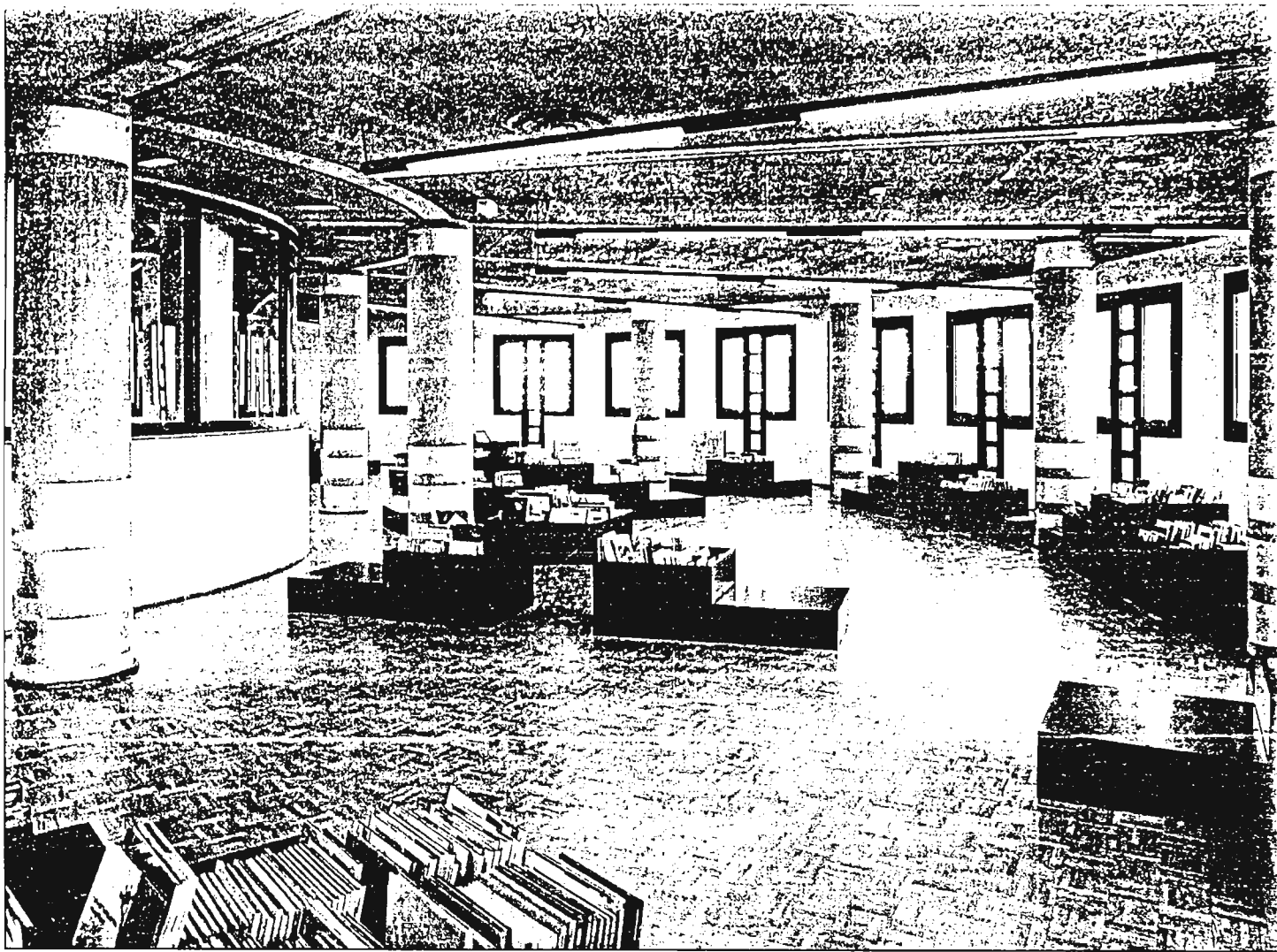
The library is considered the container of the printed material. It is connected and adjacent to the multimedia section. The library contains 30 000 volumes in addition to a few thousands of periodicals. It is addressed to the general public.

Open Book stacks

A system of open stacks have been adopted in order to foster a rather informal relationship between the user and the source of information.
Users are invited to browse and select their own material from the open stacks. In this system, space must be provided for large number of browsing readers, traffic and trolleys, also areas for reading.
It is recommended to allow for 7 sq. m for every 1000 volumes on open shelves (units are 5 shelves high). Limit length of ranges to between 5.4-9 m. Aisle between ranges about 90-156 cm. Center to center spacing of ranges is between 1.2-2 m.

The height of the island stacks should not be more than 1.6 m (four shelves), and with wall fixed shelving up to 1.85 m (five shelves). The height of the top shelf should not exceed the comfortable reach a relatively short reader.
The vertical distance between shelves will approximately 270 mm.
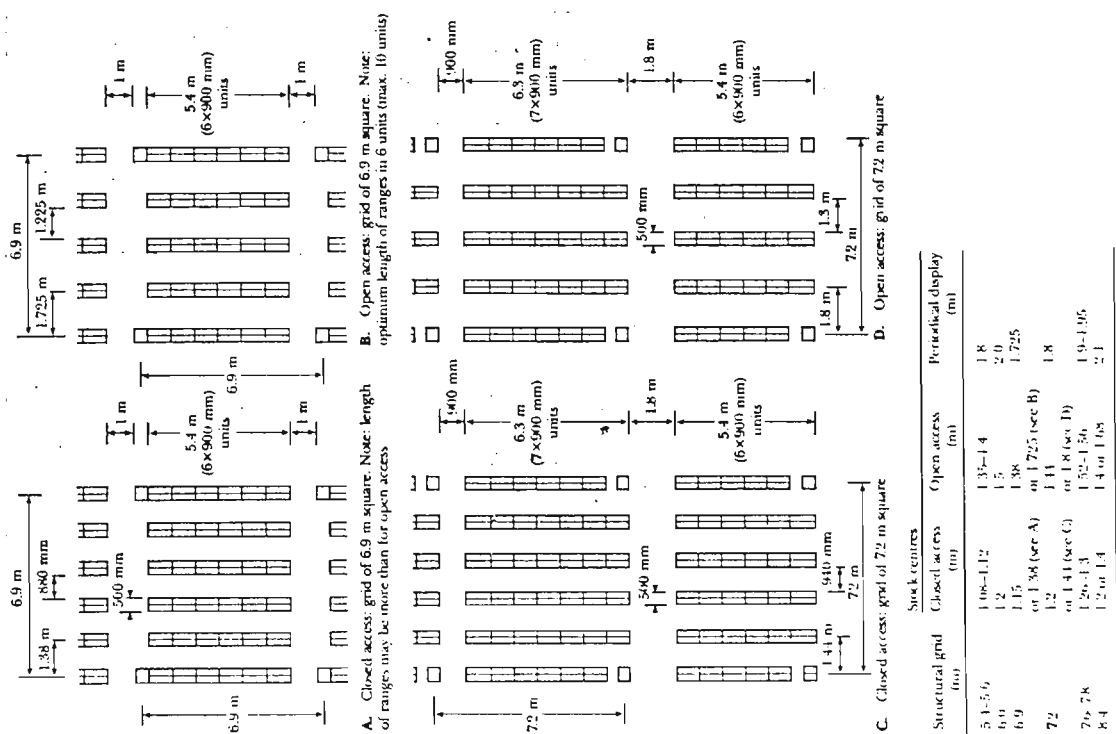
Catalogue

The library will adopt both the traditional systems of card cataloguing, in addition to the computer based system.

Computerized systems require less space and are more economical in terms of staffing.

With card catalogues provision must be made for 3 cards per volume. Card trays 430 mm deep filled to about 70% of capacity will take 1000 cards. Standard cabinets may be 5 or 6 trays wide (80-100 cm). The number of rows per vertical row is approximately 6.

The catalogue should be close to the entrance and easily accessible from the circulation desk.
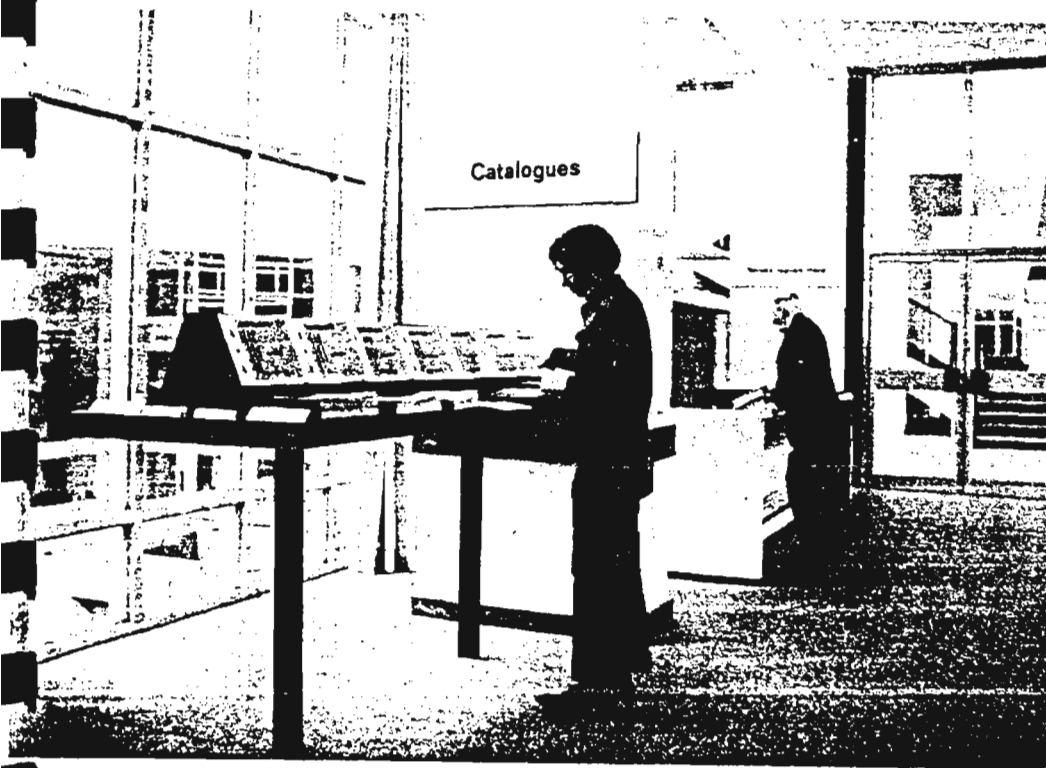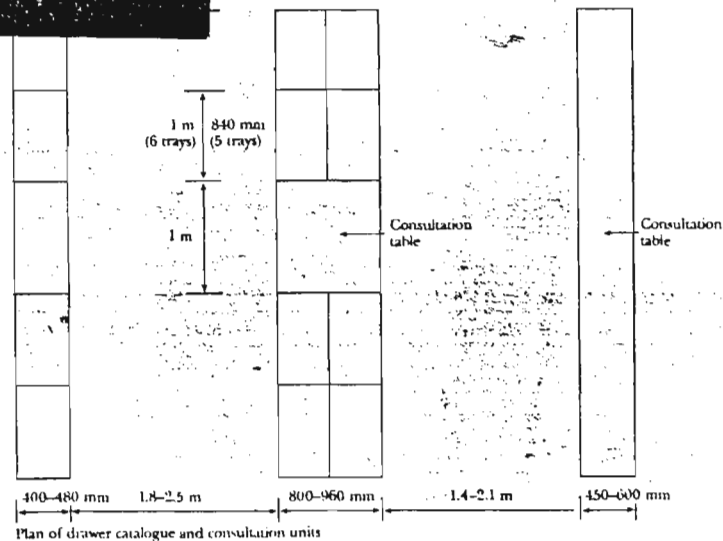
Plan of drawer catalogue and consultation units
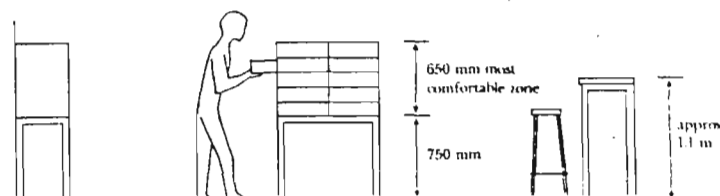
Seating arrangement

The library accommodates seating for 75 persons.
Space allowances per reader vary according to the type of seating (areas include part of the main circulation):

- small easy chair: 2.3 sq. m
- individual table (600 mm x 900 mm) and chair: 2.3 sq. m
- 4-12 readers per table without dividers, depending on width of table, lateral allowance and spacing of tables: 1.4-1.9 sq. m
- individual open carrel (screened table): 2.8 sq. m
- 4-12 readers per table with dividers: 2.2-2.3 sq. m
- 4 individual open carrels in pinwheel layout: 2.8-3 sq. m/place
- individual enclosed carrel (2.1 m x 1.7 m): 4.6 sq. m

The type of seating arrangement depends on the type of space it occupies within the library. Per example, the seating in the periodicals and news paper department will be an informal and relaxed type of seating (sofas...).
The location of tables and chairs on the periphery walls may have advantages, per example, views and daylight.

approx. 2.4 m

Groups of easy chairs around low table

600 mm
750–900 mm
700 mm
900 mm to 1.5 m (for audio-visual usage)
0.75–1.8 m
Individual tables

Allow ± 850 mm per reader
Allow ± 1 m to 1.5 m (for audio-visual) per reader
600–700 mm
1.2–2.1 m
Single-sided table

1.2–1.8 m
Table 3.4 × 1.12 m
0.75–1.8 m
0.75–1.8 m
Eight-person reading tables:
table for six 2.5 × 1.2 m minimum;
table for four 1.8 × 1.2 m minimum

1.75–2.5 m
0.91–1.5 m 600–700 mm
1.75–2.5 m
Open carrels – pinwheel arrangement. Central space can be used for services

1.5–1.7 m
1.5–2.1 m
0.75–1.8 m
Enclosed carrels

Children's section

Accommodations are included for individual and group listening to and viewing audio-visual materials and for activities such as story hours, talks puppet shows and creative play.
4500 volumes are consecrated for the children's section (15% of the total collection of books housed in the library).
It is recommended to allow for 8.5 sq. m for every 1000 volumes on open stack (units 4 shelves high).
Children's space should be in full view of control staff.
Allow for 3 sq. m of floor space per child.

Periodicals

The periodical area will contain display shelves of the current issues. An informal seating arrangement will be proposed in order to encourage browsing. Older issues will be bound and stacked on shelves. Newspaper will also be available in this area.

Structural grid

A grid is generally based on optimum spacing between shelving ranges in stack areas and on the optimum length of ranges (a multiple of length of standard shelving units - usually 900 mm or 1 m). For maximum balance between cost and utility it has been found that the grid should be at least 6 m square and at most 8.4 m sq. Standards suggest the following structural grid dimensions: 5.4 m, 6 m, 6.85 m, 7.3 m, 7 m.

Photocopy space

Approximately, 5 sq. m are needed for each machine. This facility should be easily accessible from public areas, particularly periodicals. The activity and the machines generate noise, so this space should be located so that it will not disturb users in areas which need to be quiet. There might be a need for seating for users having to wait.
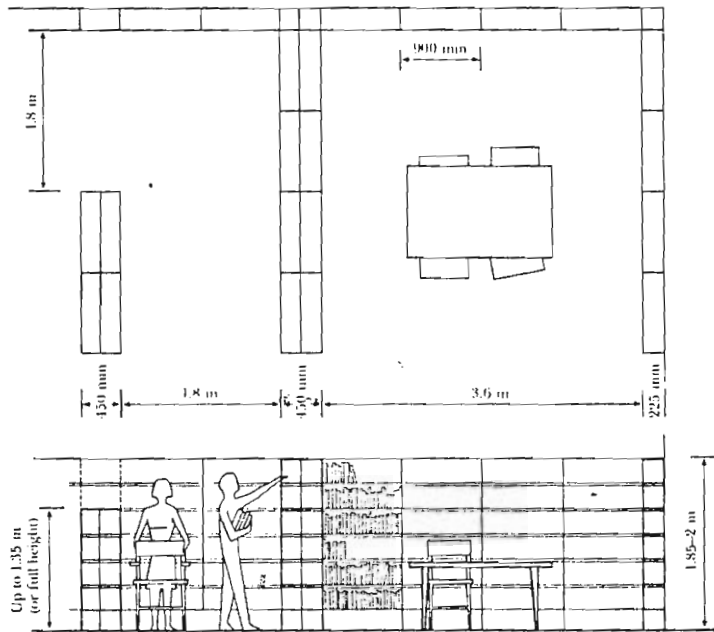
Circulation desk

Inquiries, control and supervision are one of the many functions performed on the circulation desk.

Circulation desk must be in a prominent position with control of entrance and exit to library areas.

Light

> "Libraries are about light. The main problem connected with a library is that the human eye... The human eye is only a tiny part of the human body, but it is the most sensitive and perhaps the most important part. To provide a natural or an artificial light which destroys the human eye or which is unsuitable for its use means reactionary architecture even if the building should otherwise be of high constructive value. "
>
> Alvar Aalto

North light is the most adequate and the most comfortable for reading conditions. It is softer and cooler and more uniform. The east orientation ranks as second best.

It is recommended to prevent entry of north light to the stacks and to replace it with an indirect diffused light or artificial.

Ventilation

A good ventilation is necessary. In order to avoid dust and minimize heat gain and noise from the outside, it is preferable to adopt artificial ventilation. In terms of humidity, the level required is 55%.

Offices and library workrooms

It is recommended to have a close relationship between the offices and the main public departments.
The chief librarian may require an office having an area varying between 18-30 sq. m. Other individual offices will have an area of 10-15 sq. m; space per person in general offices is 7-9 sq. m, while the space per person is 12-14 sq. m in technical process workrooms.

Acquisitions

This area employs staff in the bibliographic checking of materials recommended for purchase, preparation for orders, receiving and inspection of delivered material and execution of the preliminary processing of materials. This department should be linked to the delivery area and the cataloguing department. Extensive shelving is required for the material that needs working on.

Cataloguing

Within this department, raw material will be classified and entered in the catalogues. Maintaining the bibliographic records is one of the responsibilities of the cataloguing department. This work requires concentration and must be adequately screened from noisy areas.

Processing

In this department, materials are prepared before they are ready to use by the readers: this is where the material is plated and numbered, cards, labels and pockets are attached to books.

Administrative and work areas:
- Entrance hall
- Public services areas
- Guide areas/facilities
- Offices and workrooms
- Restroom(s)
- Lavatories and lockers
- Caretaker's flat
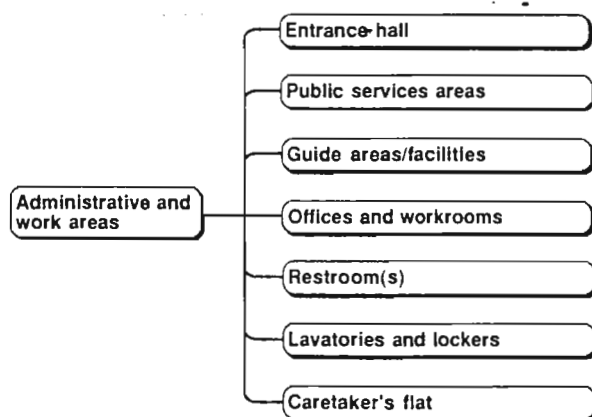
Book binding

In this department periodicals are bound in their yearly complete series forming a book format. In addition paper back books can be converted into hard cover. Book repair and reinforcement will be undertaken in this department. Packing and unpacking spaces are to be accounted for. Adequate storage space is also needed.

Storage

Storage spaces and units will be mostly needed for books. They will housed in the typical shelving units. Additional storage will be needed for files and stationary.

Diagram 1

Public entrance

Children — Lobby Exhibitions and display — Bookshop, Coffee shop

Periodicals

Audio-visual

Reference

Other public departments

Circulation counter

Cloaks and lavs — Meeting or lecture rooms

Adult lending

Administration

Staff facilities

Despatch and arrivals — Staff and deliveries

Workrooms

Diagram A

Public entrance

Lobby

Reference Periodicals Reading — Circulation counter — Office/workroom — Staff and deliveries

Adult lending — Children

A.

Diagram B

Public entrance

Lobby Exhibitions and display

Periodicals

Adult lending — I/M — Circulation counter

Reference — Catalogue — Children — Office/workroom — Staff and deliveries

Audio-visual

B.

Diagram (bottom)

Public entrance

Coffee shop — Lobby — Exhibition and display

Cloaks & lavs

Inter-library loan

Circulation counter

Staff and deliveries — Staff Administration

Workrooms

Reserve collection — Reading

Photocopy

Periodicals and audio-visual — Catalogue — Reference

Open access bookstacks may be divided into subject areas

Reading areas

Seminar

B

In other words the multimedia section could be designated as the Sound and Moving Image library. This department complements the library book collection.

The use of multimedia allows the viewer to process larger amounts of information in a very short time. Thus, information density is effectively and more efficiently learned.

The audio visual library contains the record, CD, tape, video and slides collection of the center. It will be equipped with computers, VCRs, audiotheque terminals, slide projectors and microfilm. This process does not involve any external use, i.e. lending. Users choose the record or video and notify the circulation desk which assigns them a listening or viewing booth. The slide collection however is permanently available through special monitors that are available in the library, and no staff permission is required to consult it.

This department ought to be related to the audio-visual storage.
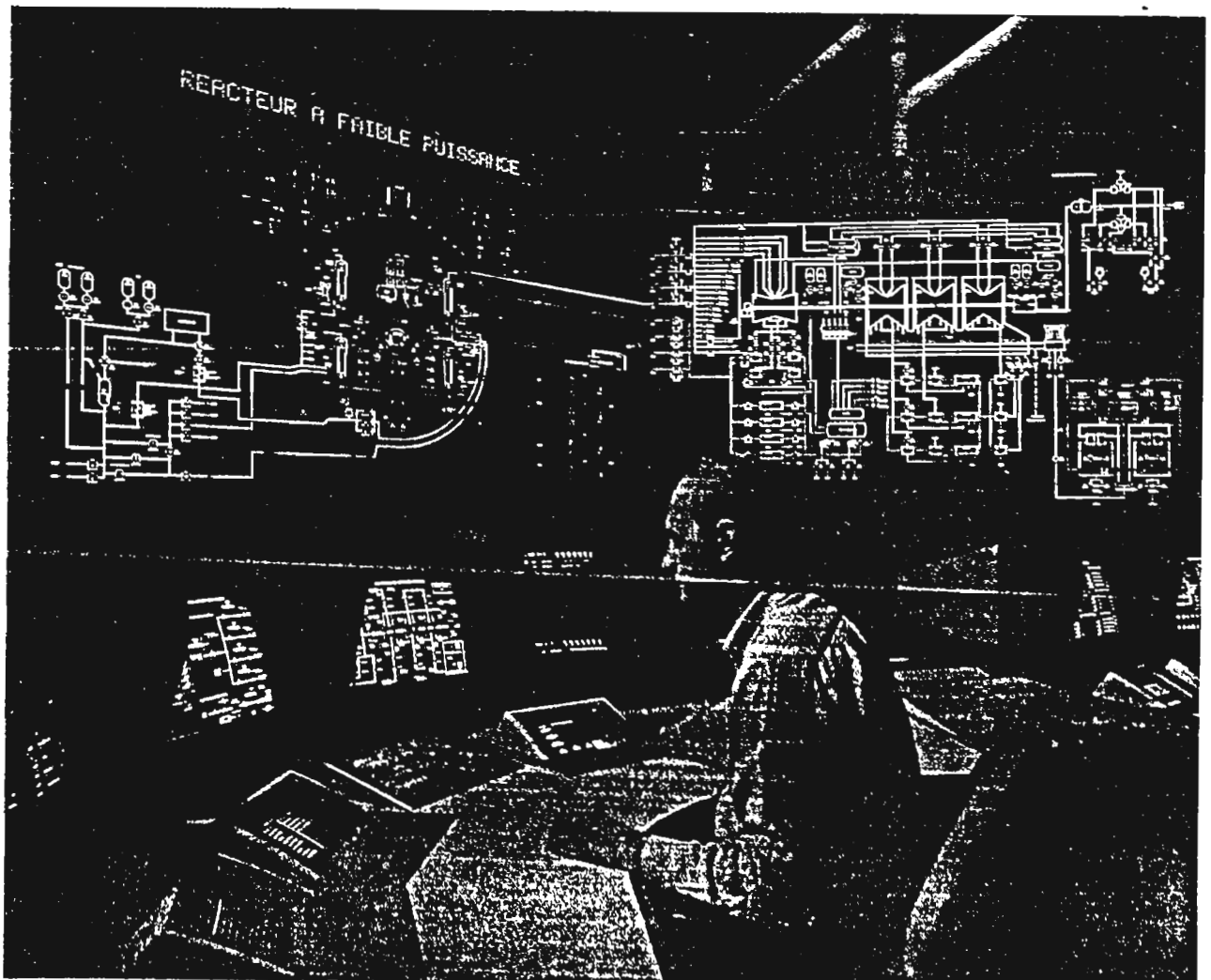
Listening and viewing booths

Listening booths could be equipped with a table and chair. headphones and a controlling device that allows the modification of the volume as well as the rewind or forward. The average area equipped by one booth is 0.8 sq. m.

Viewing booths consist of a television set and a chair. also equipped with headphones and a controlling device. One booth requires approximately 1.2 sq. m.

A common viewing room is also made available for slide projection or film projection.

Darkness will be required for the video. slide and microfilm viewing.

The space will be articulated by movable partitions. that would define the spacing arrangements of the various terminals.

The exhibits are designed for people to interact with.
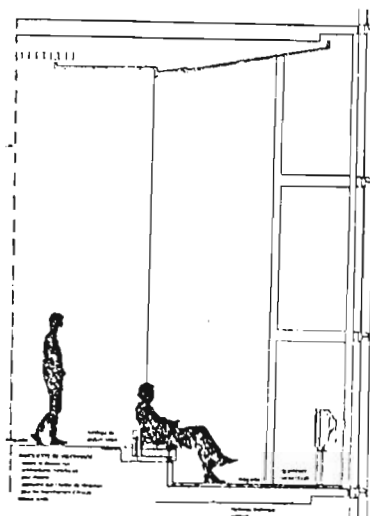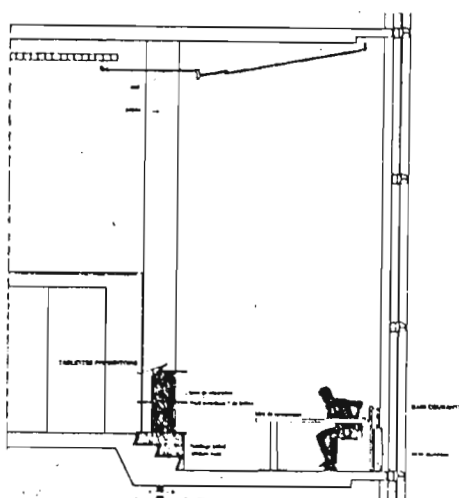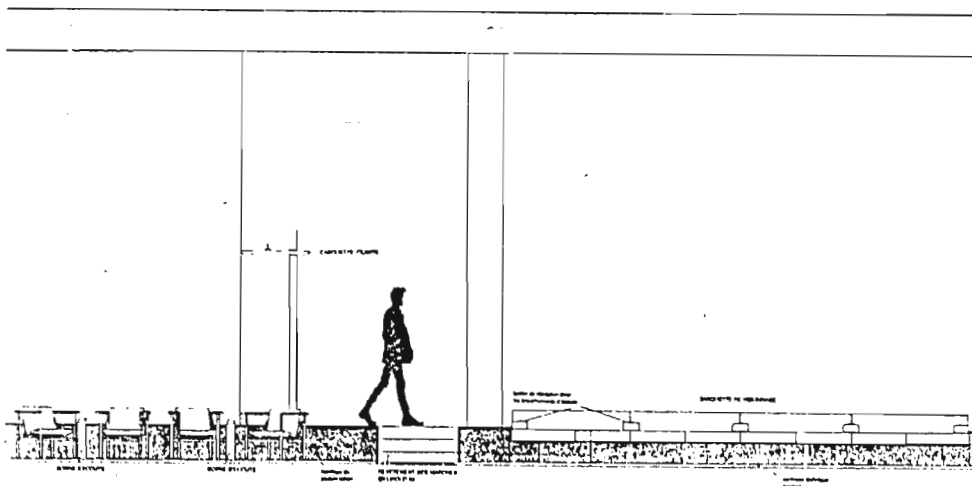
Computer lab

"The Computer and the Human mind have quite different but complementary abilities. The computer excels in analysis and numerical computation. the human mind in the pattern recognition. the assessment of the complicated situation and the intuitive leap to new solutions. If these different abilities can be combined, they amount to something much more powerful and effective than anything we have had before."
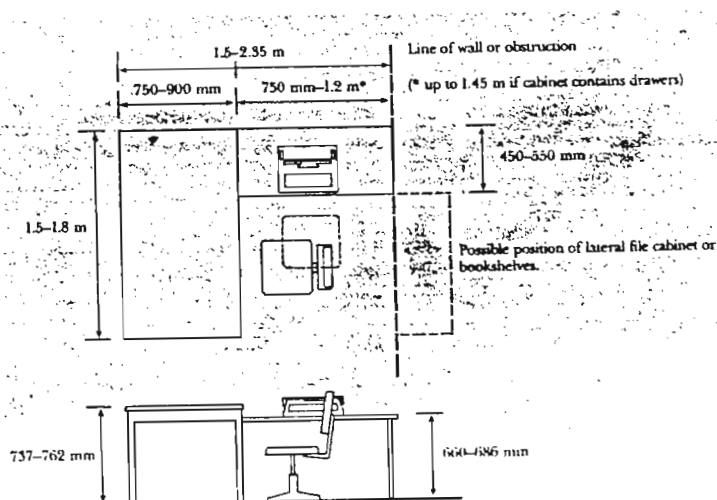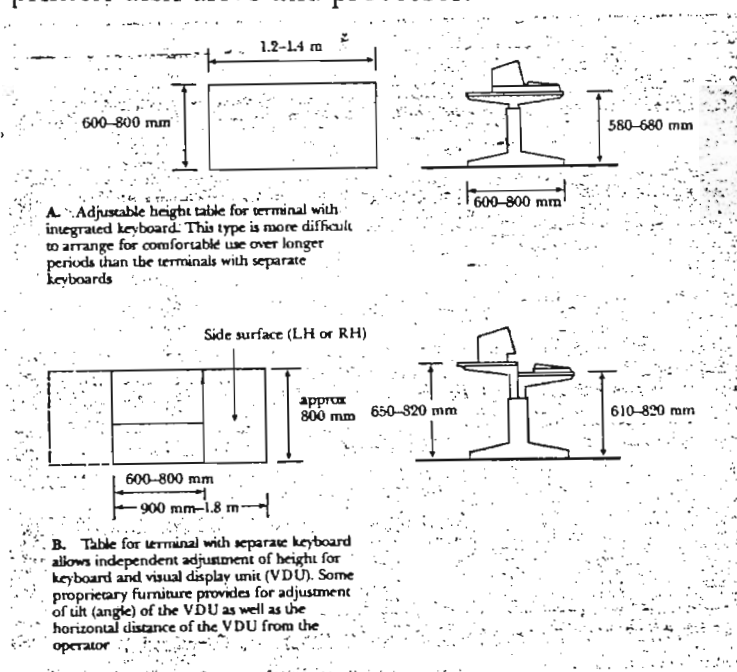
Mike Cooley

This department is open for public use to facilitate information retrieval. Libraries are now using computers for cataloging collections. retrieving data from around the world and reducing the need for storage space. Compact disks. called CD-ROM. are providing library users computer access to vast amount of information from encyclopedias. periodicals and dictionaries.

The equipment most likely to be found is the video display terminal. keyboard printer. disk drive and processor.

A. Adjustable height table for terminal with integrated keyboard. This type is more difficult to arrange for comfortable use over longer periods than the terminals with separate keyboards

B. Table for terminal with separate keyboard allows independent adjustment of height for keyboard and visual display unit (VDU). Some proprietary furniture provides for adjustment of tilt (angle) of the VDU as well as the horizontal distance of the VDU from the operator
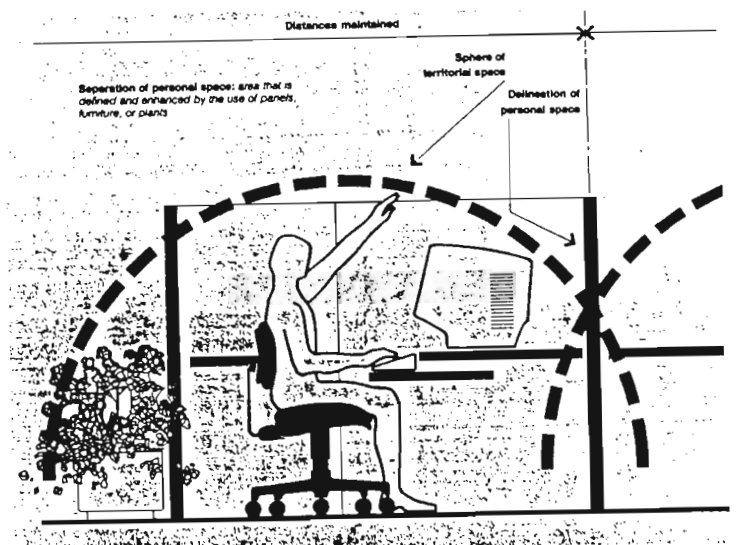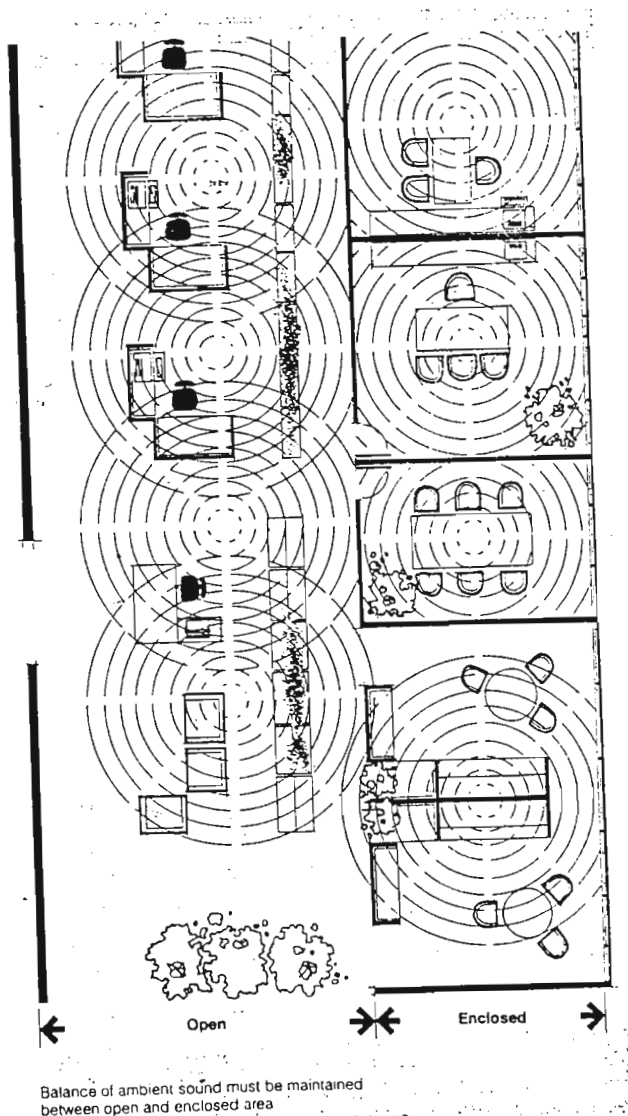
Acoustics

The equipment is noise generating and some noise control ought to be undertaken in order not to disturb the neighboring functions and activities. The following procedures can be used:

- Acoustic hoods designed to fit around and over noise generating equipment.
- Locating extremely noisy equipment in separate areas removed from the general activity.
- Enclosing the equipment in full height partitioned spaces that have been properly constructed and sealed to prevent sound transmission.

"When you are interacting with a computer, you are not conversing with another person. You are exploring another world."

John Walker

Open   Enclosed

Balance of ambient sound must be maintained between open and enclosed area

Distances maintained

Separation of personal space: area that is defined and enhanced by the use of panels, furniture, or plants

Sphere of territorial space

Delineation of personal space

RESTAURANT

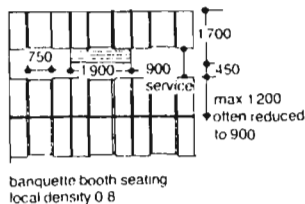The coffee shop offers meals all day long, it accommodates seating facilities for 100 persons.
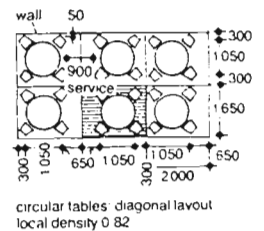
The restaurant of a more formal character, accommodates 50 persons. It offers two meals.

With seating at tables for 4 to 6 people an area of 0.9 to 1.4 sq. m should be allowed per person. Service aisles should not be less than 90-135 cm.

The ratio of service area to total area should be approximately 25-50%. On the other hand, the net kitchen area is 15-25%.

The kitchen area should be divided into areas for servery, area for cooking, frying, grilling and preparation of soups and vegetables cold buffet (meat, salads, fruit, fish, sweets and dessert); wash-up area.

Toilets for customers, staff toilets, food storage, including refrigerator and deep freeze and liquor storage are also required. The cashier ought to be located next to the exit.

square tables: square layout
local density 1.4

square tables, diagonal layout
local density 0.92

circular tables: diagonal layout
local density 0.82

banquette booth seating
local density 0.8

large booth in recess
local density 0.86 if seating 10 people
or 1.1 if only 2 people sit on bench seat

counter service
local density 1.26
dimensions A & B increased where 2
waiters employed

DISCOTHEQUE

The dance floor should be designed in a way to allow for 1.0-3.5 sq. m couple. The discotheque will have seatings along the bar (20 persons) and tables for 40 persons. It will be equipped with the latest light and sound gear, to immerse the users in the right mood. There is no need for daylight.
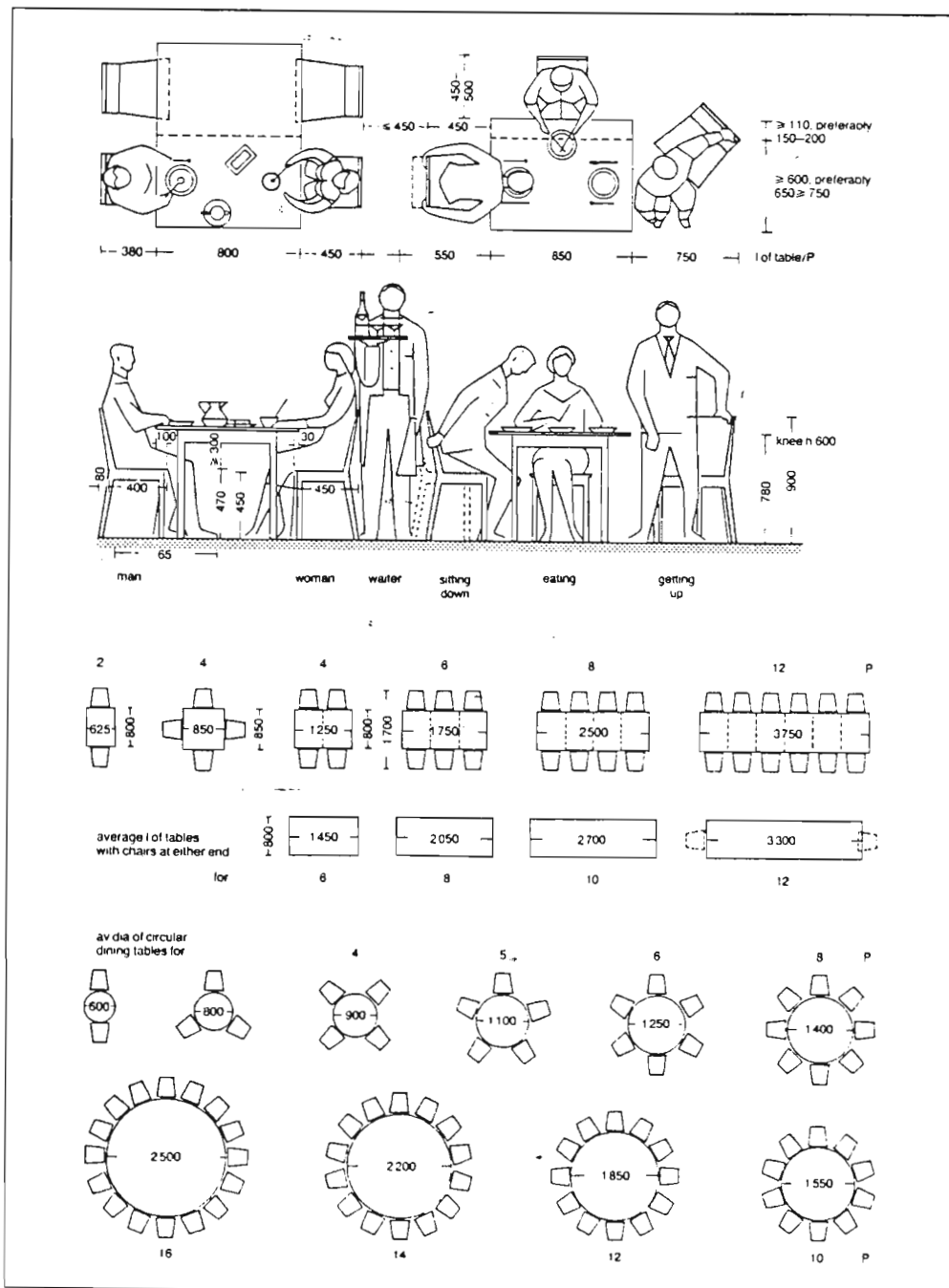
MEDIA THEATER

The media theater offers an experimental stage in addition to the traditional performances and cinema projection. It accommodates seating facilities for 300 persons. Projection room, backstage facilities and storage space are provided. In this performance space, maximum interaction between the audience and the performers is elicited. The latest technological equipment will be adapted.

Moreover a special theater (Cinemania) with hydraulic audience seats for special effects is designed for 50 persons. This installation allows for maximum immersion in the space of the projection. In this theater pure entertainment is the aim, while on the other hand, the media theater has a formal, cultural, artistic character.
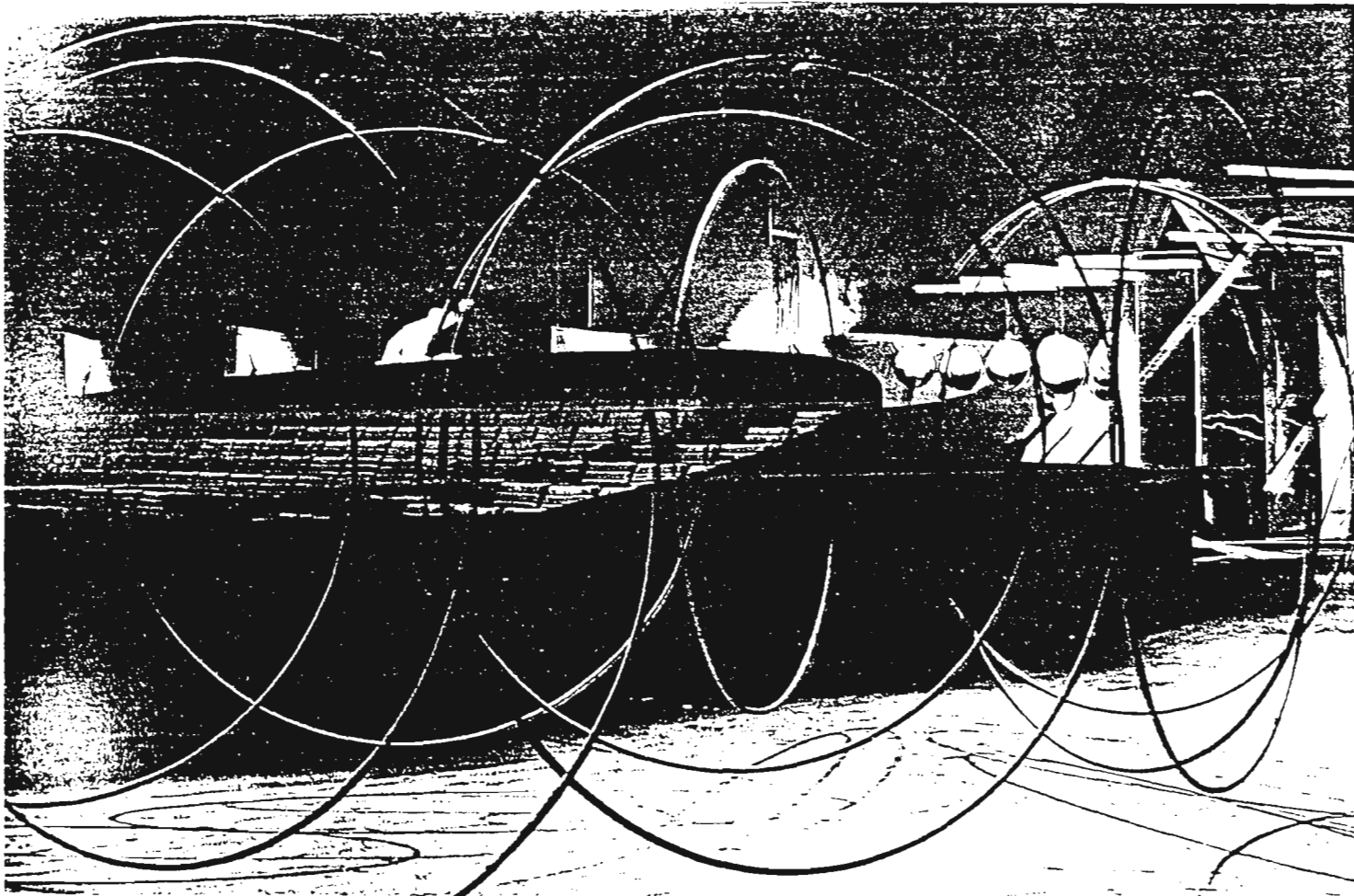
Seating

Chairs generally need 1400 spacing and a width of 750 mm. Seating is usually laid in straight or curved rows. The typical hall volume for drama and speech is 7.5 m cube to 14 m cube/ audience seat.

The minimum width of gangway is 1 m.

Generally there are two types of theater seating: Standard and Continental.

Standard seating

This system of seating is characterized by the following criteria:

- the row spacing shall provide a clear space not less than 30.5 cm from the back of one chair to the front of the most projection of the chair directly behind it.

- The rows of chairs shall not exceed 14 chairs between aisles and exceed seven chairs from an aisle to a row end.

- Aisles serving 60 seats or less shall be a minimum of 76 cm wide. Aisles serving more than 60 seats shall be at least 91 cm wide when serving seats on one side and at least 107 cm when serving seats on both sides.
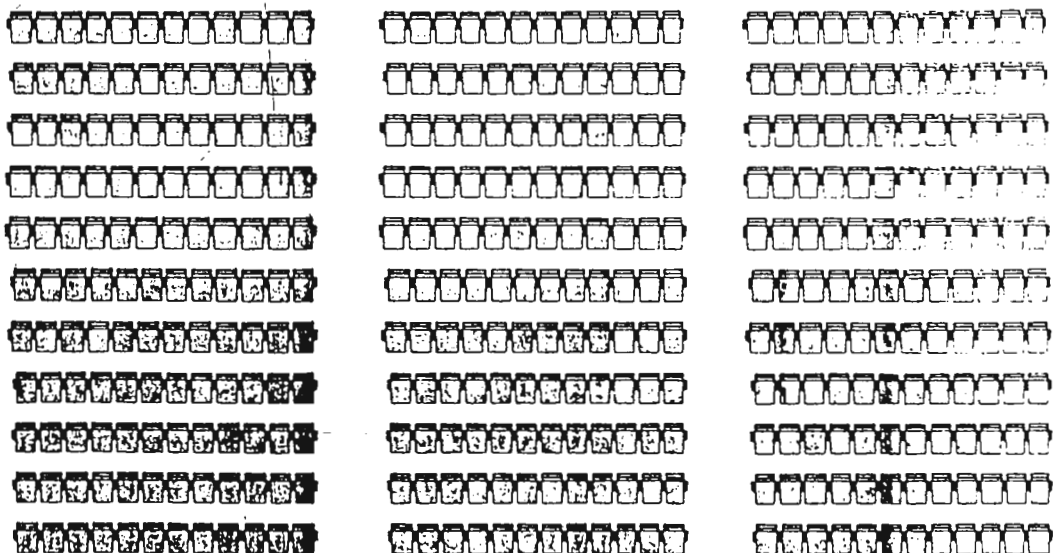
Multiple-aisle arrangement.

Continental Seating

- Row spacing shall provide a clear space of no less than 45.7 cm between rows of 18 chairs or less; and 50.8 cm between rows of 35 chairs or less; 56 cm between rows of 45 chairs or more to a maximum of 100 chairs per row, measured from the back of one chair to the front of the most forward projection of the chair directly behind it with the self-rising seat in the up position .

- There shall be exits of 168 cm minimum clear width along each side of the chair rows for each five rows of chairs.

- Aisles shall not be less than 112 cm in clear width.
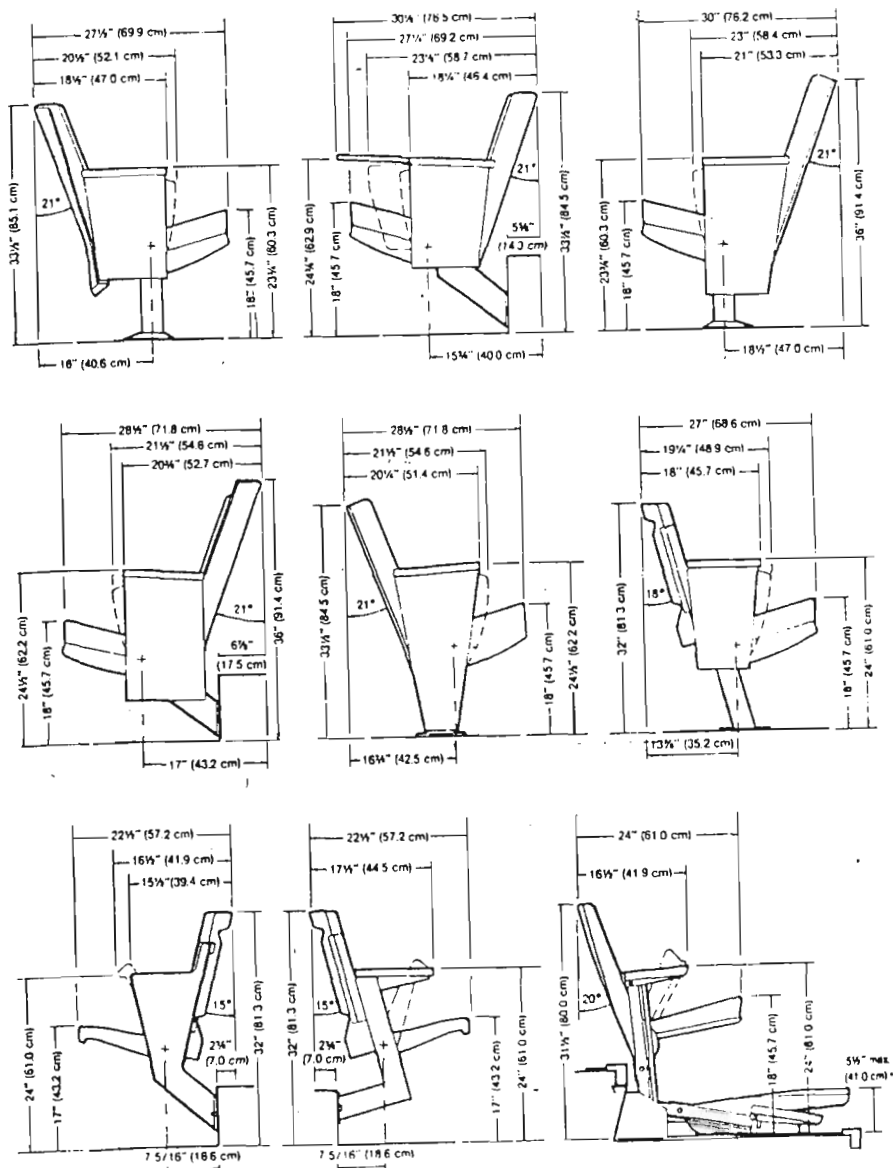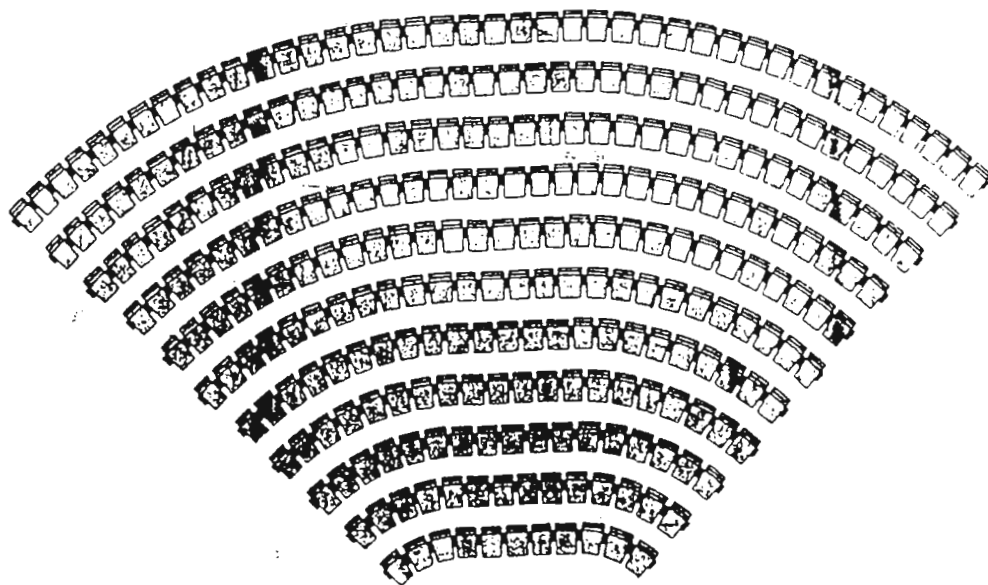
Sight lines

The study of sight lines is necessary in order to allow for visual access to all the audience. This means that members of the audience should be able to see over the heads of the persons in front of them. Some dimensions are important to serve this purpose:

- Eye height is at approximately 1.12 m
- The tread of seating tier (row spacing), T: 0.8-1.15 m
- The minimum clearance/row, assuming that the spectator will see between the heads of the spectators in the row in front is C: 0.065 m.
- A clearance of 0.13 m will allow the average spectator to see above the head of the average spectator in the front row.

The boundary limit of the seating area of the auditorium might be defined by:

- A maximum horizontal viewing angle of 30 degrees.
- A maximum vertical angle of 35 degrees.

In order to determine the floor rake of the theater, the following method could be adopted: the lowest and nearest point that the audience should be able to see should be first established, then the eye level of a person seated in the front is located at a height of 1.12 m. A sight line projected back from P over the head of the person in the first row will cross the vertical line of a person in the second row. A height of 100 mm is normally measured above the eye level to clear the head.
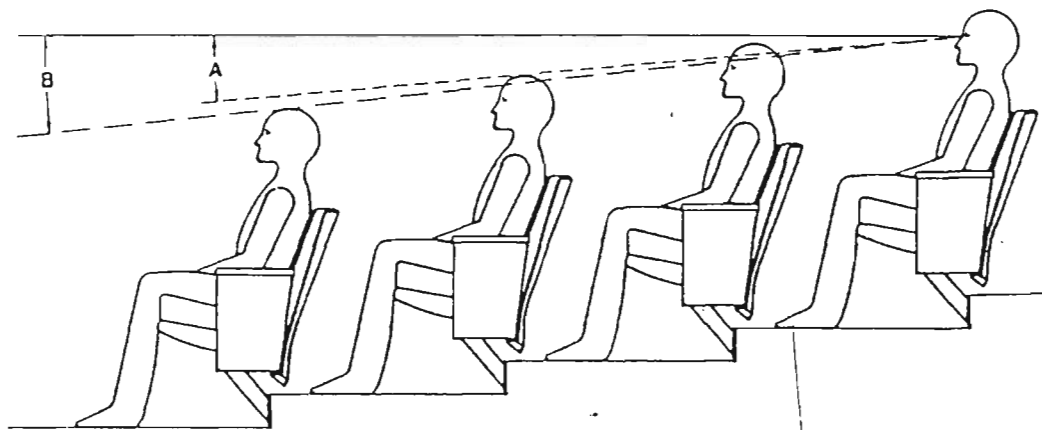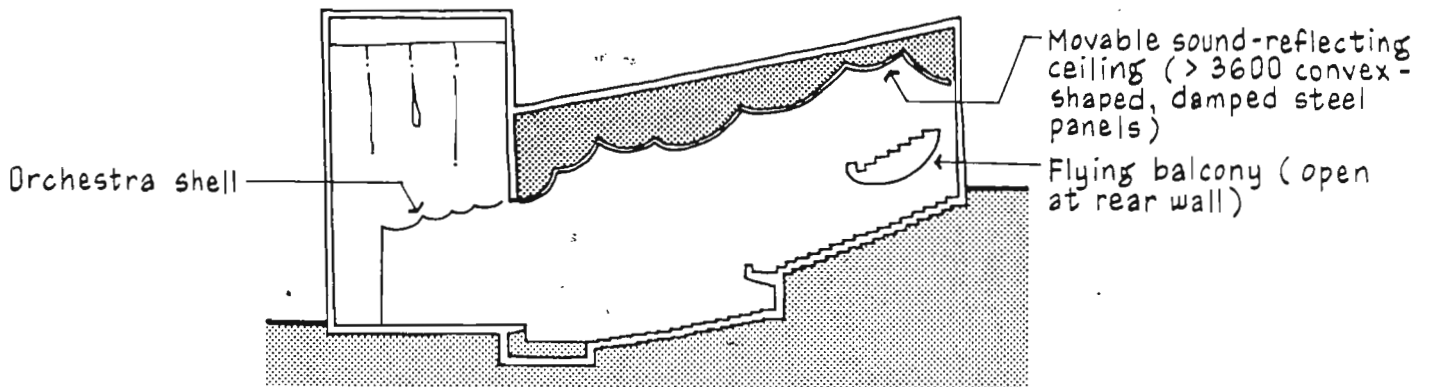
Acoustics

The acoustic characteristics of a space are dependent upon the behavior of
sound reflections and on the period of reverberation. The reverberation time is
usually short for clarity of speech and it is usually longer for singing. Moreover,
it depends on the amount of sound absorbed and reflected by the surfaces of the
auditorium and its stage.

The most common conditions for the production of echoes are parallel reflecting
surfaces, which produce flutter and curved or faceted distant walls which
concentrate delayed reflected sound.

Convex and irregular surfaces aid sound diffusion. One way of reinforcing the
sound from the stage is to provide reflectors above the front part of the
auditorium to direct the sound to the back seats.

Orchestra shell

Movable sound-reflecting
ceiling (> 3600 convex-
shaped, damped steel
panels)

Flying balcony (open
at rear wall)

Concert hall (3000 seats)

Stored orchestra
shell

Fly loft

Orchestra pit

Movable sound-reflecting
ceiling (lowered to
reduce cubic volume)

Opera house (2300 seats)

Fly loft

Forestage
extension

Movable sound-reflecting
ceiling in lowest position
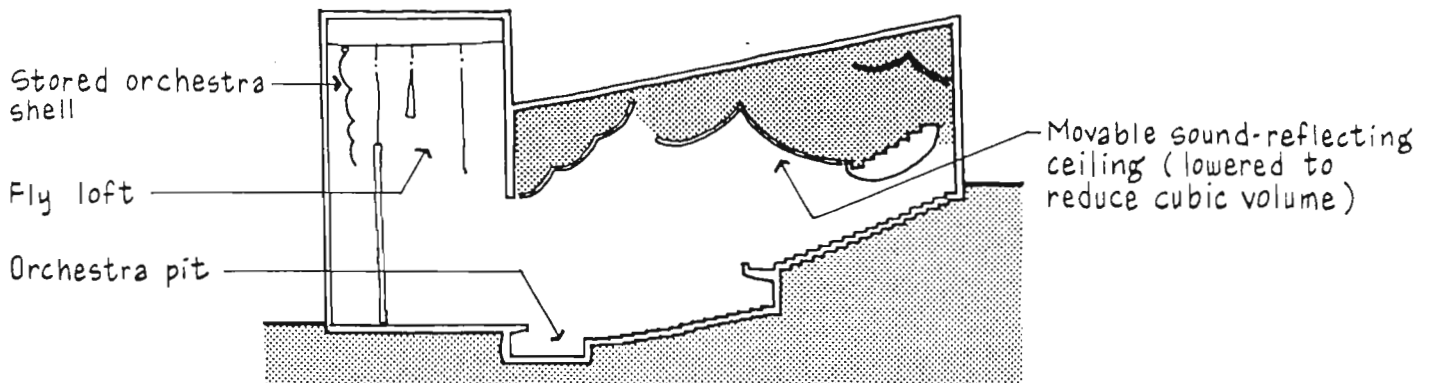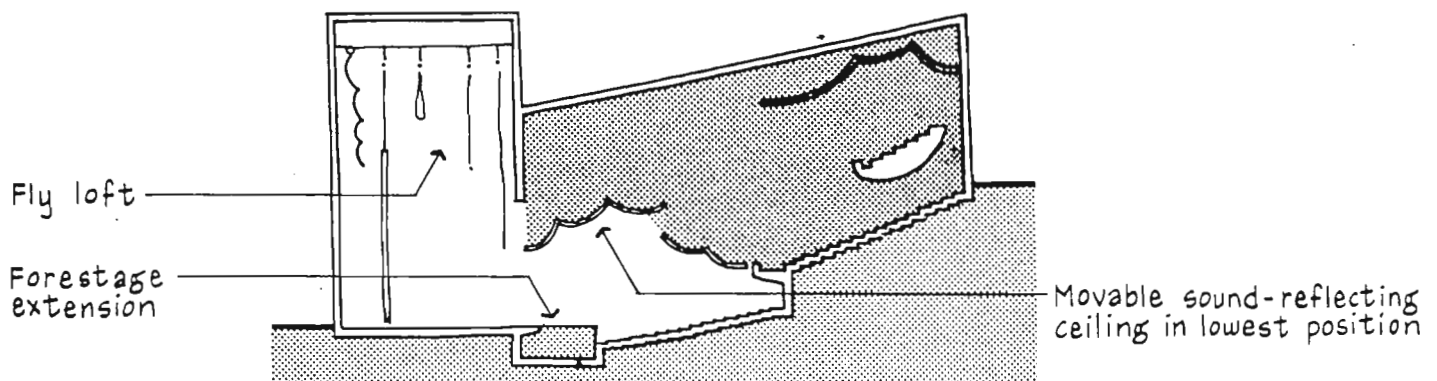
Drama theater (900 seats)

Stage and orchestra pit

The floor of the pit should be 2-3 m below the stage. To allow for variety in the stage set and production the stage is sometimes divided into areas capable of being raised or lowered with stage lifts to give flexibility for the stage set. Some sort of basement is needed below the acting area. the stage can be completely demountable with the facility to remove individual sections of the stage.

Orchestra Pit Details

Projection of apron (to permit performers to be close to audience)

Overhang volume (to provide space for adjustable sound reflectors and absorbers)

Adjustable absorption (curtains or removable panels to reduce sound level of brass instruments and to blend and balance orchestral sound)
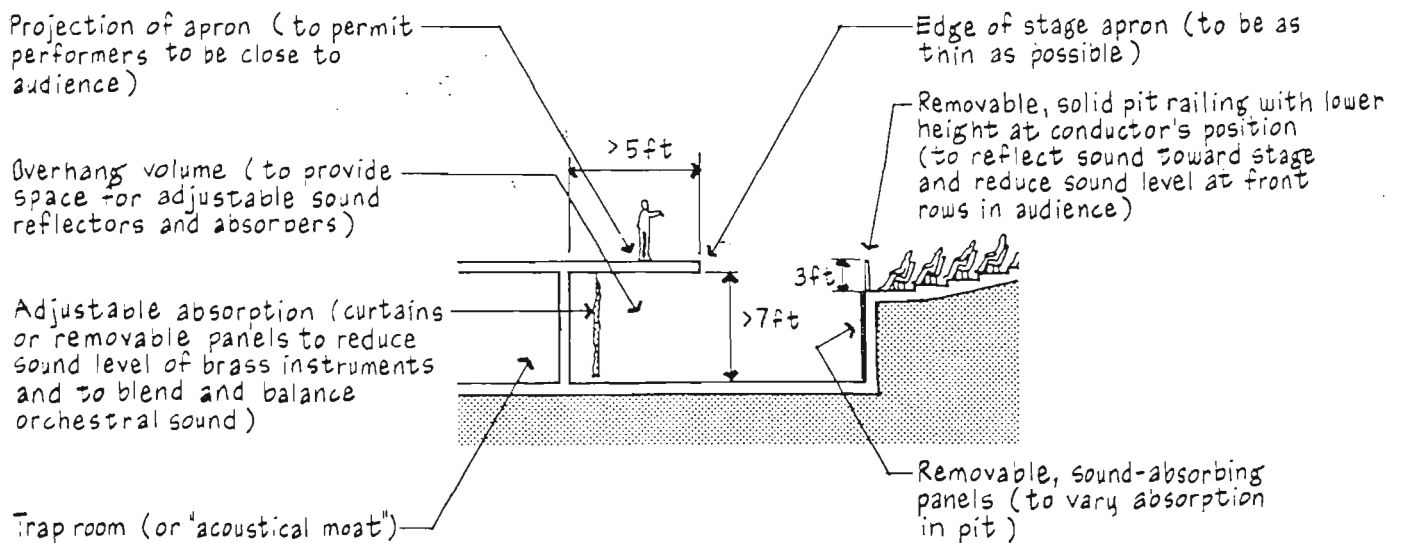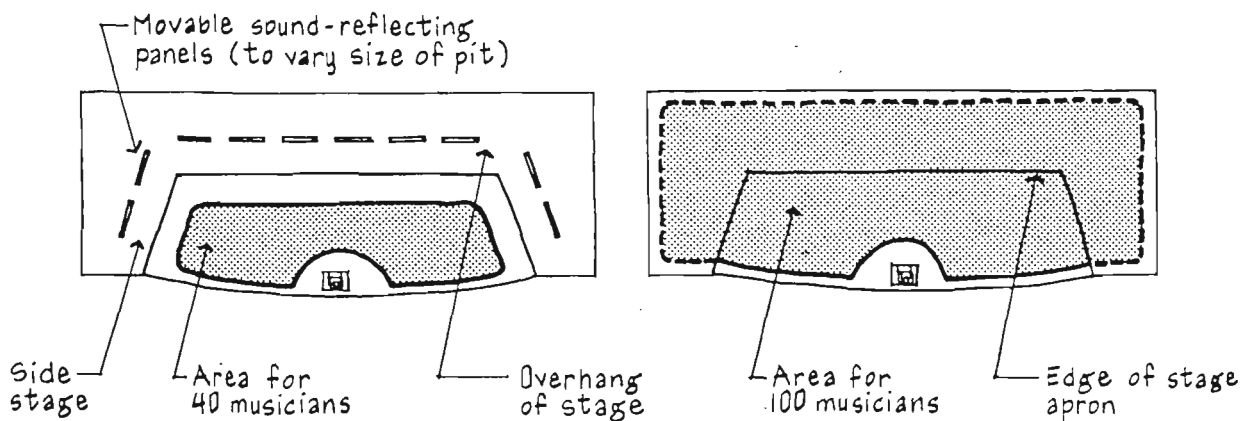
Trap room (or "acoustical moat")

Edge of stage apron (to be as thin as possible)

Removable, solid pit railing with lower height at conductor's position (to reflect sound toward stage and reduce sound level at front rows in audience)

>5ft

3ft

>7ft

Removable, sound-absorbing panels (to vary absorption in pit)

Orchestra Pit Layouts

Movable sound-reflecting panels (to vary size of pit)

Side stage

Area for 40 musicians

Overhang of stage

Area for 100 musicians

Edge of stage apron

Stage lighting and sound equipment

The lighting installations are done in a way to allow, in principle, that Any part of the stage will be lit from several different angles. The main location of lighting is from the overhead within the stage and auditorium ceiling, from slots at the sides of the auditorium and stage, and less frequently from the foot lights. Border lights and sometimes spotlights are used for toning. The stage switchboard may be located at the rear of the auditorium in a lighting booth.

Both lighting and sound control rooms could placed at the rear of the auditorium. The stage manager would operate from the side of the stage to communicate with all the parts of the theater. Provision for camera tracking space during a filming session of a live performance should be considered.

Dressing rooms

The layout of the dressing rooms should allow adequate facilities for performers to put their normal clothing and personal items. There should be provision for hand and face washing and convenient access to toilets.

There should be a minimum of one toilet and one shower per six actors and one wash basin per four actors.

The area required for a single dressing room is approximately 15 sq. m; while a communal dressing room requires 8.3 sq. m per bay.

Storage

A storage area is needed to house scenery. All storage should be easily accessible from the backstage. Racks must be provided in the scenery store.

PHILLIP R M DENNE

70 SYSTEMS LIMITED, U K

CINEMANIA

INTRODUCTION

There is a new breed of simulator which uses the best technology available to create pleasure and excitement for the general public. These machines are different from simulators previously designed, for several important reasons:-

1. Their purpose is to create a fantasy and not to simulate an accessible reality. For example, the general public do not really want to know what it actually feels like to hit the deck of an aircraft carrier or take part in air-to-air combat. They do not really want to know what it is like to take off in a Spacecraft or experience maneouvres in a weightless Space environment. The public wants a fantasy sensation which is reality as they think it ought to be.

2. Everything is exaggerated. No aircraft turns may be properly banked, nothing is smooth, straight and level for more than a few seconds, Spacecraft can pull high-g during maneouvres and there is music with the sound effects.

3. The simulators do not stand alone, but are part of a bigger fantasy, represented by the theming of their environment. For example, before climbing into a "flight simulator" the "passengers" go through "passport control" where a uniformed attendant ushers them into a "departure lounge" prior to boarding a civil flight. If it is a military theme they are given a "combat briefing" by a "flight commander" prior to take off. After leaving the simulator through another door, they pass through "debriefing" or perhaps "Spaceport control" and there is always a souvenir shop.

4. Although a leisure simulator may be just a fairground ride in some installations, it is most profitable when it is enshrined in a carefully-contrived environment which emphasizes the expensive technology within the simulator itself.
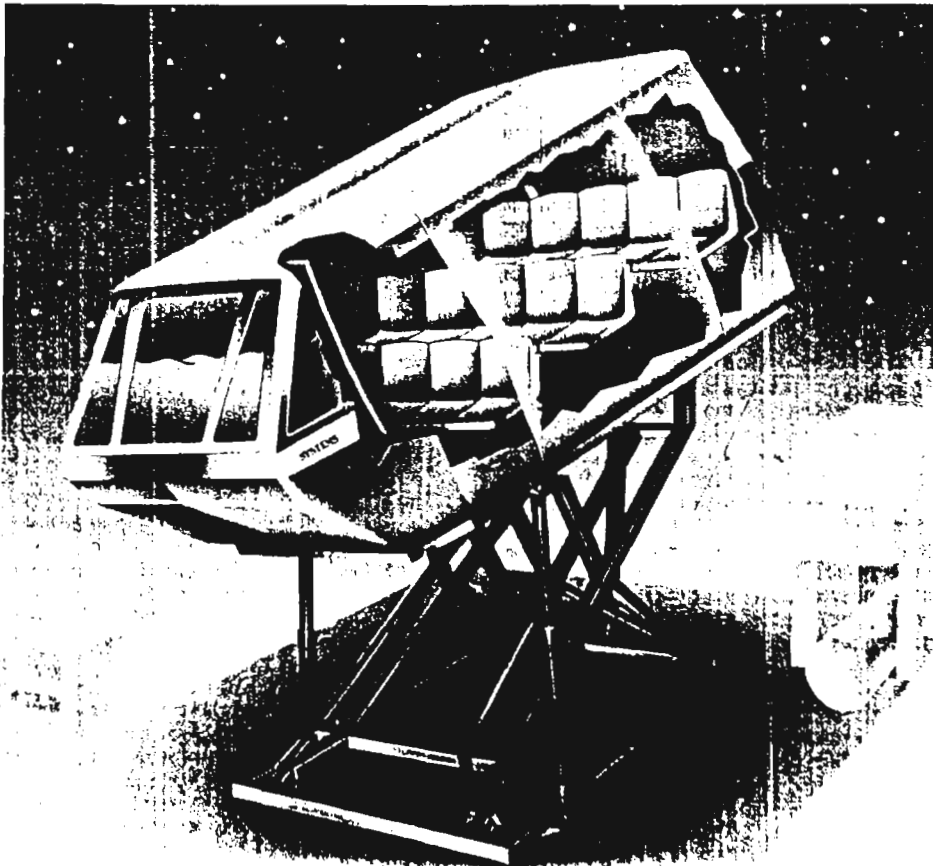
A SMALL ENTERTAINMENT SIMULATOR

EXAMPLES OF LEISURE SIMULATORS

Theatres

These machines are theatres because the audience is substantially passive, watching a visual display, hearing the appropriate sound effects and feeling the motion cues.

The simplest of these is a small capsule, holding 12 or 15 people facing a projection TV screen. Each member of the audience is encouraged to believe that he/she is alone in the cockpit of a fighter aircraft, a spacecraft, a submarine vehicle or a helicopter. The capsule is mounted on a motion system base which moves the complete assembly around fairly violently in correspondence with the visual display. The experience sequence lasts for about three minutes and is prerecorded on video disc.

Larger units of this type have been constructed up to a practical limit of about fifty people, after which the size of the viewing screen begins to control the dimensions and the weight of the moving theatre and the cost of the hydraulic mechanism increases more rapidly than the throughput.

Stationary theatres can be constructed up to almost any size, using an individual motion cueing system for each seat or each block of seats. The decrease in physical motion disturbance can be recovered by an increase in the visual spectacle using wide screen displays so that the theatre as a whole retains its impact.

Large Interactive Theatres

An increase in the entertainment value of a simulator can be obtained by coupling an image-generation computer to a number of theatres and using a uniformed "captain" to fly the theatre through the database to provide an experience which is unique to each audience. It is also possible for several theatres to be flown interactively, the occupants of each being told to look out for the flight path of the companion theatres during the experience ("The other Spacecraft" for example). Formation flying, formation combat or even mutual combat can be simulated. The real-time interaction greatly enhances the vividness of the experience for all participants. It has been proposed that four theatres working in pairs could interact in real time with a CGI machine costing £1.5M and still make money for a British resort pier complex.

Transporter

There is a unique class of theatre which might be called a transporter. This takes the form of a small room in which the audience is requested to stand or sit for a short time, on their way to the main simulator experience and possibly on their way back. The transporter is mounted on a vertical axis short stroke motion system and is controlled in such a way as to produce sensations of movement and general unease, whilst the occupants are told that they are travelling through time or Space. The movement is emphasized by simple fibre optic or zenon lamp effects. In fact, of course, the participants do not go anywhere at all and just leave by another door.

Small Interactive Simulators

These are based on low cost computer graphics in contrast to computer-generated imagery. The low cost graphics are similar to those available in any video game but in this case a motion system is added and the seat back or helmet contains a stereophonic audio system. The Japanese have been especially quick to exploit this type of simulator.

Sports Training Simulators

It is now possible to use simulation technology as a serious aid to sports training. This applies in particular to those sports which require good aiming and balancing skills and the learning of fast reactions to unpredictable environmental changes.

The most obvious examples are Ski Training - on a moving belt supported on hydraulics and synchronised to a simple visual system; Hang Gliding - using a six-axis suspension system whilst viewing a projected display; and a Golf Range in which a real club strikes a tethered accelerometer ball towards a projected golf course display. These simulators are in various stages of development.

TECHNOLOGIES

A number of simulation technologies can now be applied to the Leisure Industry in products of the type which I have previously described.

Computer Generated Imagery

Even crude 5,000 polygon CGI pictures are interesting to the general public when they are part of an exciting experience. Nevertheless, the public soon demands improvements to the "reality" of the picture and they are especially impressed by texturing, tree transparency, good clouds, battle smoke, target fragmentation and so on. As soon as familiar objects are displayed, away from the unfamiliar experience of the battleground or of pseudo-space environments, the public complains that buildings lack detail, for example. Recent improvements in photographic texturing are impressive and will overcome this problem.

Multi-channel CGI systems can provide a ve exciting environment to the lay public ente ing a simulation capsule for the first ti and they provide a feeling of largeness in the visual scene which cannot be matched by film without very considerable cost.

Multi-channel CGI picture generation can produce stereoscopic or pseudo-stereoscopic displays which are striking in their effect.

Million-polygon CGI displays generated off line and recorded on video disc frame by frame provide visually impressive artificial pictures whose cost can be justified by the large numbers of "experience theatres" in which they may be employed. Interactive simulators, using video discs and image processing techniques can produce a fully interactive theatre simulator at a cost which is a fraction of that required for a 5,000 polygon real time CGI computer system.

Stereoscopy

A stereoscopic TV display makes a strong impression on the human brain as part of a

simulation experience. It is not merely that the picture appears to have depth, but that there is a strong psychological effect which creates an impression of increased picture quality. The resolution appears to increase and the visual noise level is reduced by a correlation effect. The most striking benefit is a greatly-enhanced perception of movement – and movement is the essence of the most exciting fantasy experience in Leisure simulators.

Artificial stereoscopic TV pictures can be produced by a CGI machine. The polarised spectacles required for viewing conventional stereoscopic pictures can be built into Space helmets or similar artifacts which form part of the themed experience. Lenticular screen systems are now being studied for large Experience Theatres where there is an objection to the use of polarised viewing glasses.

Motion Systems

In a passive audience simulator there is no requirement to simulate yaw accelerations of the vehicle. When the accelerations are small there is no psychological effect, being equivalent to the normal rotation of the head from side to side when travelling. The disturbing part of a strong yaw acceleration can be represented by its sway component. This might be experienced, for example, in a racing car simulation. Because it is not necessary to match the motion experience to any true reality it is normally unnecessary to reproduce surge and sway motions which have a short rise time. These accelerations can therefore be coupled into the pitch and roll components respectively.

A general purpose 3-axis (heave, pitch and roll) system is normally adequate for Leisure simulation work. Since the motions are exaggerated and because the motion system is operated almost continuously for ten hours a day seven days a week in season, the hydraulic system components need to be robustly constructed, with particular attention to the type of seals employed.

Short-stroke hydraulic pitch, roll and heave motion mechanics are fitted to blocks of seats in some experience theatres; the hydraulic motion serving only to disturb the psyche rather than to overwhelm it with motion sensations.

The smallest type of Leisure simulator motion system is the pneumatic seat cushion and seat belt variety, which is effective in the presence of overwhelming visual simulation experiences such as those produced by wide screen or multi-channel displays. "Hot Seats" are used in the largest simulator projects.

A 25-seater simulator is in development, for which continuous rotation is possible in pitch and roll axes.

Audio Techniques

In a large theatre the most usual recourse is to multi-channel sound systems, reducing to a simple quadrophonic system in a small simulation capsule. Where the themed experience includes the wearing of a helmet it is possible to arrange for the sound to be fed into earphones, in which case the "artificial head" form of stereoscopic recording is employed to enhance the spacial effect, with conventional loudspeakers contributing to the environmental sound.

Olfactory Simulation

One company has specialised in the provision of artificial scents, quantities of which are introduced into the simulator airflow to create the right olfactory sensation. For example, kerosene near aircraft about to take off, hot rubber on a car racing track, cordite fumes in a battle area, sea air on the carrier deck and so on.

SPIN OFF

The large-scale production of simulation equipment whose development is financed by the Leisure Industry opens up markets in other areas.

The availability of low cost simulator systems which are manufactured in quantity makes it easier for third world countries to purchase training simulators for civil and military applications.

The attention-grabbing capability of large audience passive simulation techniques is being put to use in theatrical presentations for product promotion and company promotion seminars. Several large themed leisure projects now in the planning stage require the use of CGI technology to provide an interactive demonstration to a large audience in an individual-seat-motion theatre complex. This presentation technique is especially attractive for the most popular theme of Space exploration and for Local Authority projects which promote the attractions of the area in a theatre environment, interspersed with mock helicopter flights between one location and another. The use of seat motion and unusual visual imagery adds to the impact of information presented on an otherwise uninspiring subject.

Most large scale leisure projects are now intended to be semi-educational – that is to inform as well as to entertain. The educational side of these projects may be expanded in special sessions for school children and the programme of the Experience Theatre may be extended in scope to expound one particular aspect in depth at any time. Typical themes are local history, geography/geology, seamanship, global geology and, of course, Space technology.

One of the most interesting spin-offs is a medical application in the treatment of phobias. The individual under treatment is led by the psychiatrist through a pre-programmed journey which enters, step by step, into the situation most feared by the patient. The advantage of the simulator is that it is possible at any instant to "freeze" the increase in stress or to fade the simulation down in its intensity relative to local reality. The patient is therefore trained to become gradually more confident in the phobic situation.

SUMMARY

Simulation systems are now becoming a part of the Leisure industry, because their effect is to take a stronger grip of the human psyche than is possible by other means. The machines are safe, do not take up much space and, being enclosed, can operate in all weathers.

Important information can be firmly impressed
upon an audience in a pleasurable manner.

High grade training can be provided for those
sports in which the novice is at considerable
risk, where training time is very expensive
or the physical resource is at a high prem-
ium.

A recent report for a UK Government study
group recommends that the Leisure applica-
tions of simulation technology should be
studied as an important diversification of
the industry.

VIRTUAL REALITY DISPLAYS

The virtual reality display will invite the visitors into its world of simulation and fantasy. The micro environments of a simulation capsule serve to immerse the visitor in different environment.

As a three-dimensional space for visualizing three-dimensional digital space, a VROOM 3m x 3m x 3m cube with three of its faces receiving projected images of a single model, each face driven by a separate RealityEngine2. People enter a VROOM wearing special goggles that reveal the stereoscopic projected images, while manipulating views, parameters, equations, time or anything else the programmer allows. The RealityEngine2 is a device for rendering more than one million textured polygons per second. Such graphic power allows a user to move smoothly around a textured, complex model in real time with little of the hesitation that destroys the illusion of being immersed in space.

The electronic equipment required to support this system can be considered in five categories:
- tracking system to locate the user's hands, head and body (magnetic, acoustic, inertial, mechanical or optical)
- haptic systems to provide force and pressure feedback
- audio systems, including both sound sources and spatial localization
- image generation systems which produce visual scenes
- visual display devices

A sixth category could be included: the computers which produce the simulations of the virtual worlds.

These displays will allow for different types of simulation systems.
There is no need for daylight.
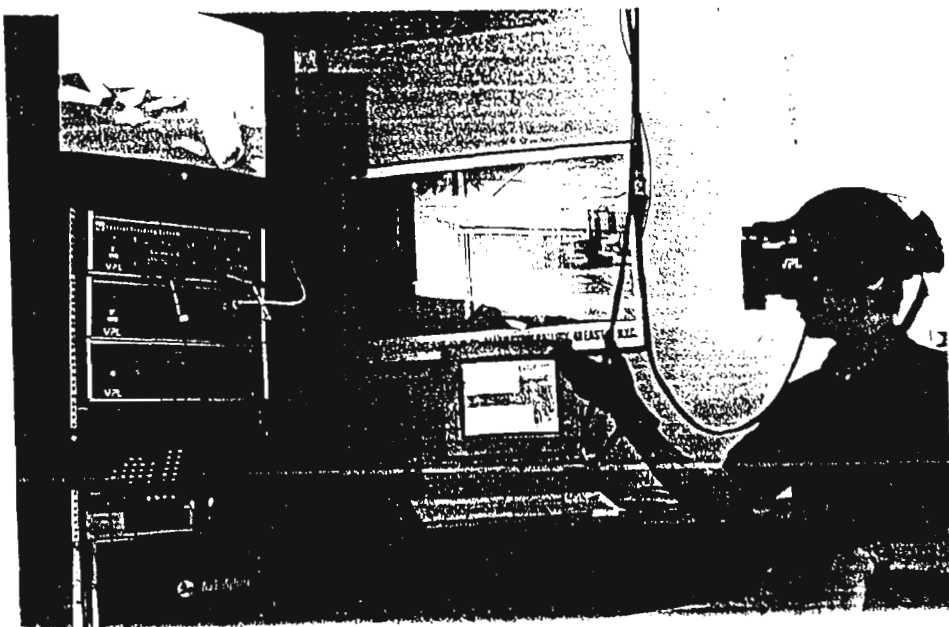
OFFICES and ADMINISTRATION

There are three types of private offices, those with high ranking personnel, and those for staff that is close to noisy areas and conference rooms.
Acceptable room proportions should not exceed 1/1.5.
Private offices accommodate one person, one visitor seating, an external space allocation for a secretary and a private toilet.
The president's office should have access to a 20 person conference room.
Within the conference room an area of 1.5-2 sq. m. person is required.

Semi-private offices

This kind of offices is provided for two or more persons assigned to the same task. The space can be an open plan with the subdivision made by furniture layout.

It is customary to provide rest rooms and kitchens for the staff. Provision of lavatories and locker rooms will be also necessary.

Typical Conventional
42 Sq. Ft.

Typical Electronic
52 Sq. Ft.

Additional Space Requirement

Note:
The decision to allocate space assignments based on anticipated growth should be evaluated according to the following criteria:

1 Anticipated speed and frequency of technological growth

2 Cost of oversizing initial workstations
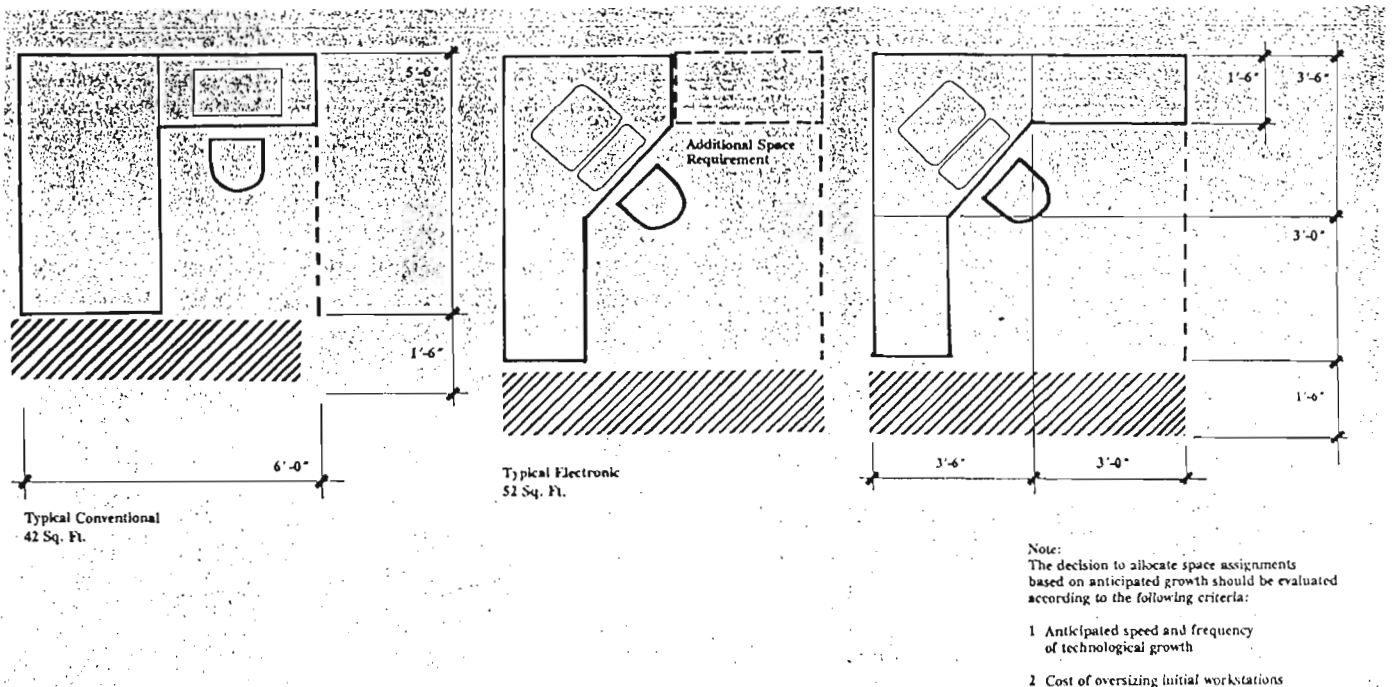
STUDIOS

This department is responsible of the production of some of the audio visual materials used in the center.
 - videotapes: the essential components for the videotape recording system are: camera, microphone, videotape recorder, television monitor and an editing controller. It might be necessary to provide video tape recording facilities.
 - Tape recording: volunteers may record their reading of books on audio tapes for the use of visually disabled people.
 - Slides production: a film developing laboratory will be required.
- Microfilm and microfiche.

In addition, an arts studio will house the graphics department that will be responsible of the preparation of the graphic materials needed in the center: posters...

Recording studio

The main installation will be:
- video monitors, cameras, videotape...
- speakers for program sound and intercom system
- light control
- audio control
- switcher to preview, mix, produce effects and edit.

These studios will be necessary for the preparation of presentations and performances.

Canted and sloped shapes diffuse sound and prevent unwanted flutter echoes within the studio.

FLOOR PLAN

ELEVATION-AA

ELEVATION- BB
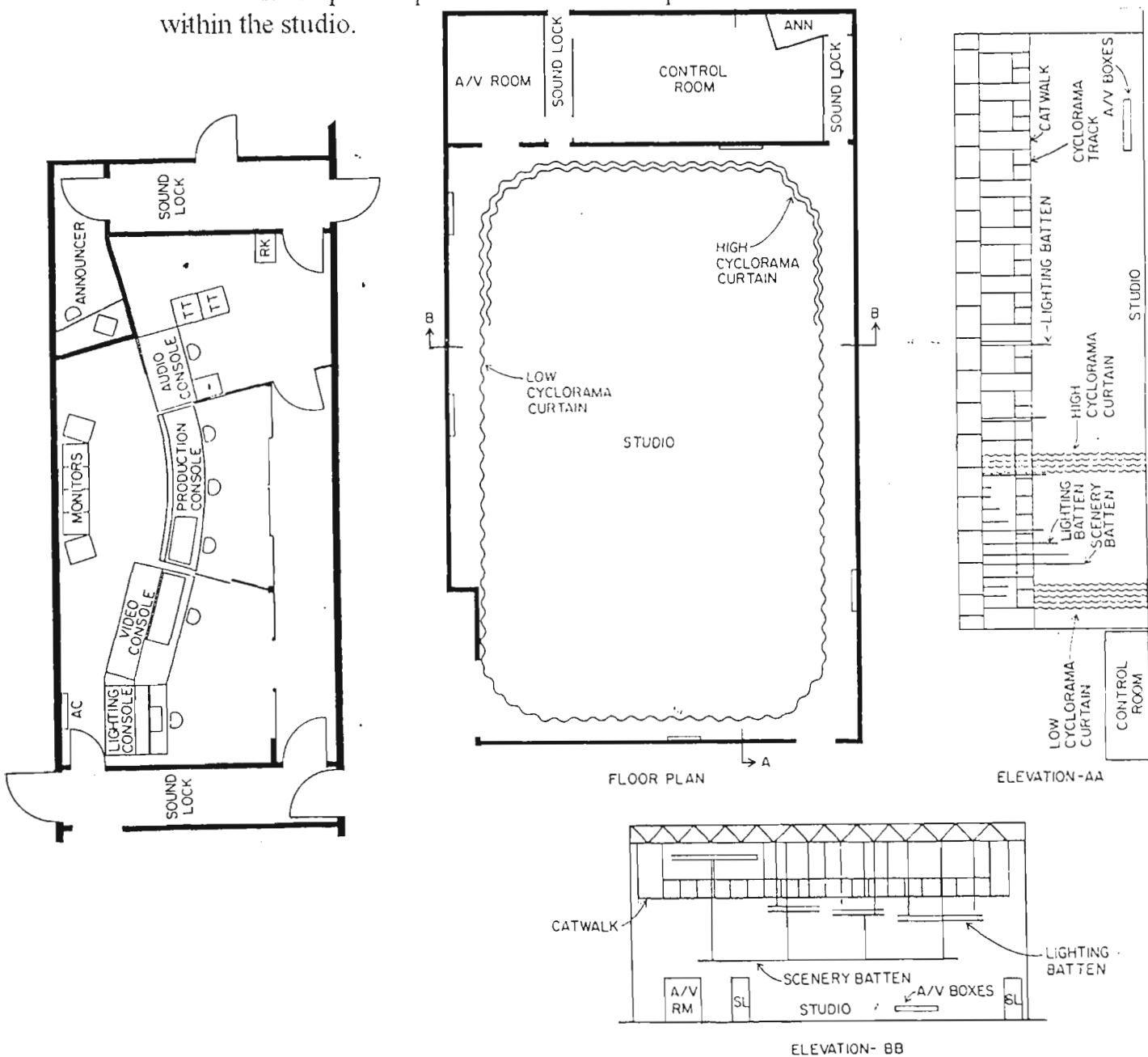
Typical studio layout.

Photographic laboratory

The photographic lab will be equipped with all the necessary instrument for slide development and reproduction.

boratory Organization

Film Supplies →	Film Storage of Raw Stock and Cut Negative	Administration & Production Offices		Review Theatres	
		Positive Printing	Positive Developing Machines →	Release Print Inspection & Despatch	→ Completed Print
	Grading	Negative Cutting	Chemical Mixing & Solutions Circulation	Chemical Stores	← Chemical Supplies
	Laboratory Special Effects Work	Preparation & Cleaning		Control Laboratory	
			← Negative Developing Machines	Sensitometric Control	← Exposed Negative for Processing

CK DIAGRAM OF FILM LABORATORY. Principal laboratory operations grouped to show departmental flow, practical layouts seldom conform precisely to ideal arrangement. Auxiliary services not shown. Shaded areas indicate dark end of machines.

Exposed Negative from Studio → Negative Developing

Negative of unwanted scenes to Storage ⤏ Inspection Break-down & Assembly

Timing for Rush Printing

Negative to Storage after printing ⤏ Positive Printing | Pos: Raw Stock

Positive Developing

Rush Print Delivery to Studio ← Rush Print Viewing
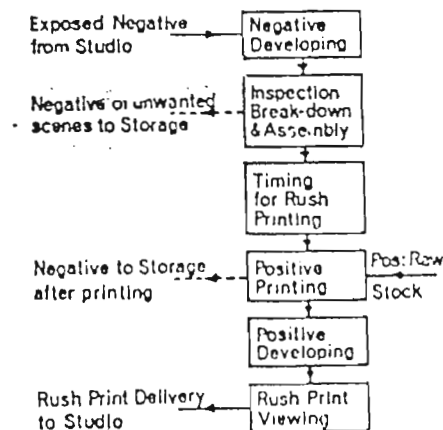
Computer lab

The computer lab is a facility that serves the whole center. The administration relies on it for:
- processing statistics
- documenting administrative records
- financial documentation and references

The computer center should be located in a centralized manner, in a way to serve both the administration and the library. In addition, it is located in the realm of the staff zone, away of the public zone.

Lighting
It is recommended to avoid direct sunlight. Fluorescent lighting and diffused natural light are preferable.

Acoustics
The computer units generally produce sounds that are disturbing to the staff working nearby. Sound control is achieved through carpet flooring, false ceiling with porous tiles, door seals for insulation.

Ventilation
The space must be air conditioned in order to provide a temperature around 15 degrees. Humidity must be prevented in paper and disk storage space.
In addition, the space must be air tight in order to prevent air draft.
The fenestration ought to be tightly closed to prevent dust particle accumulation.

Meeting rooms that could be used for association and committees. The conference room accommodates seating facilities for 80 persons. It is also equipped with storage space to house the instruments needed.

The convention is to allow 1.7 sq. m/person including circulation percentage, but the room has to be flexible enough to allow changing layouts and uses: T-shaped, U shaped or classroom style.

This kind of rooms is also able to accommodate for projections and screening. One of the best methods of projection being the rear projection system which has many advantages:

- concealment
- its allowance of high level or intensity of room light
- ease of use

The rear projection ought to be deep enough to allow a throw distance, that is the distance the light beam must cross between the lens and the screen in order to produce a correct image. The minimum depth of the rear projection room must be three times the height of the required image.
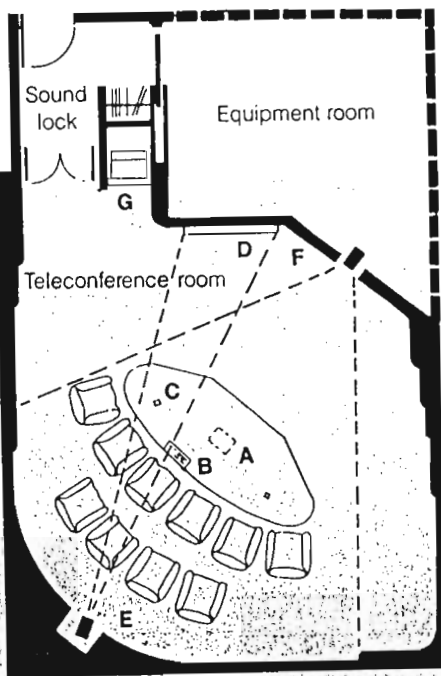
Legend: A, overhead graphics camera; B, control panel; C, microphones; D, electronic blackboard; E, camera/monitor; F, video screen; G, facsimile machine. Prototypical facility designed by Associated Space Design, Inc.
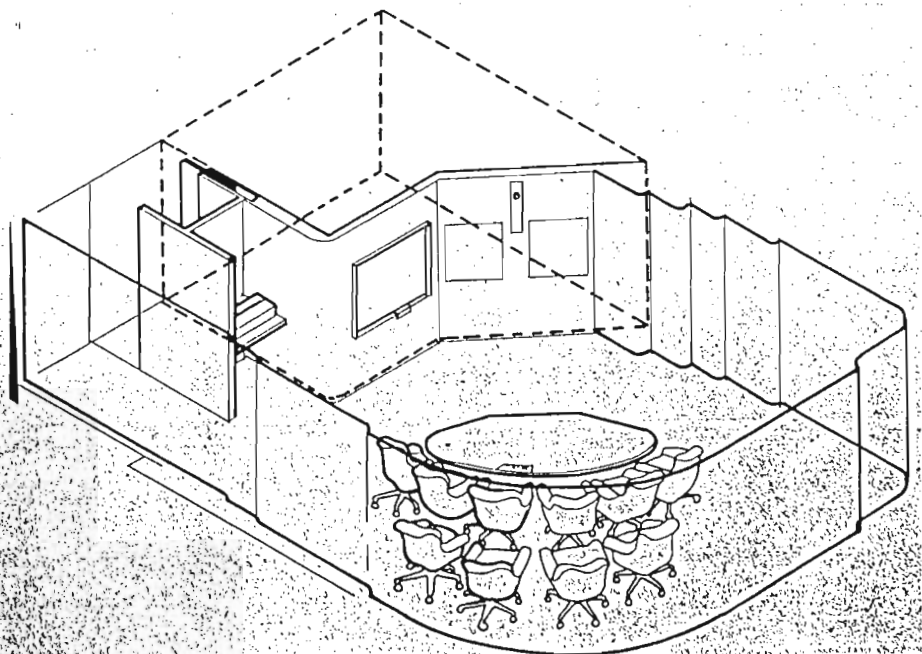
SHOPS

The shops accommodated within this project are: a media gift shop, book shop and a records tower.

The shops ought to be adjacent to, and with access from the entrance hall. The front shop or the display area will be placed facing the entrance hall in order to attract the attention of passers-by.

As for the layout, a counter with cash register will be located near the shop entrance for easy supervision.

The records tower and the book shop will be equipped with computers to help users find a specific book or record.

Media gift shop
This shop could be part of the book shop or independent from it. It will promote electronic gadgets, posters,...

Book shop
It houses different types of books but it will be rather specialized in books and magazines pertaining to media and technology.

The books will be displayed in shelves similar to those used in the library.

Tower record
It will sell CDs, Laser Disks, audio cassettes...of all the different types of music.

Hearing facilities will be provided to permit the customers to listen to the disk of their choice before purchasing it.

Aisles between the display shelves will vary between 1 m and 1.2 m.

SERVICES

Plant rooms are required for air conditioning or heating and ventilation, in addition to electrical substation. Service spaces should be grouped together and located to minimize length of service run.

For delivery, a loading /unloading area is required. An area of 35 sq. m per van (10 m x 3.5 m), in addition to space for the loading dock should accounted for.

Storage

Storerooms are required for furniture, cleaning materials and general equipment.
Its location should be close to the service or delivery entrance and it should also be easily accessible from the workshops. It is preferable to keep the storerooms fairly shallow, with a maximum depth of 5.5 m.

Media/Theater

Library

Multimedia

Lib. Admin

Administration.

Permanent Exhibition

Services/Workshops Studios

ENTRANCE Hall

Temporary Exhibition

Retail

Restaurant Cafe

Discotheque
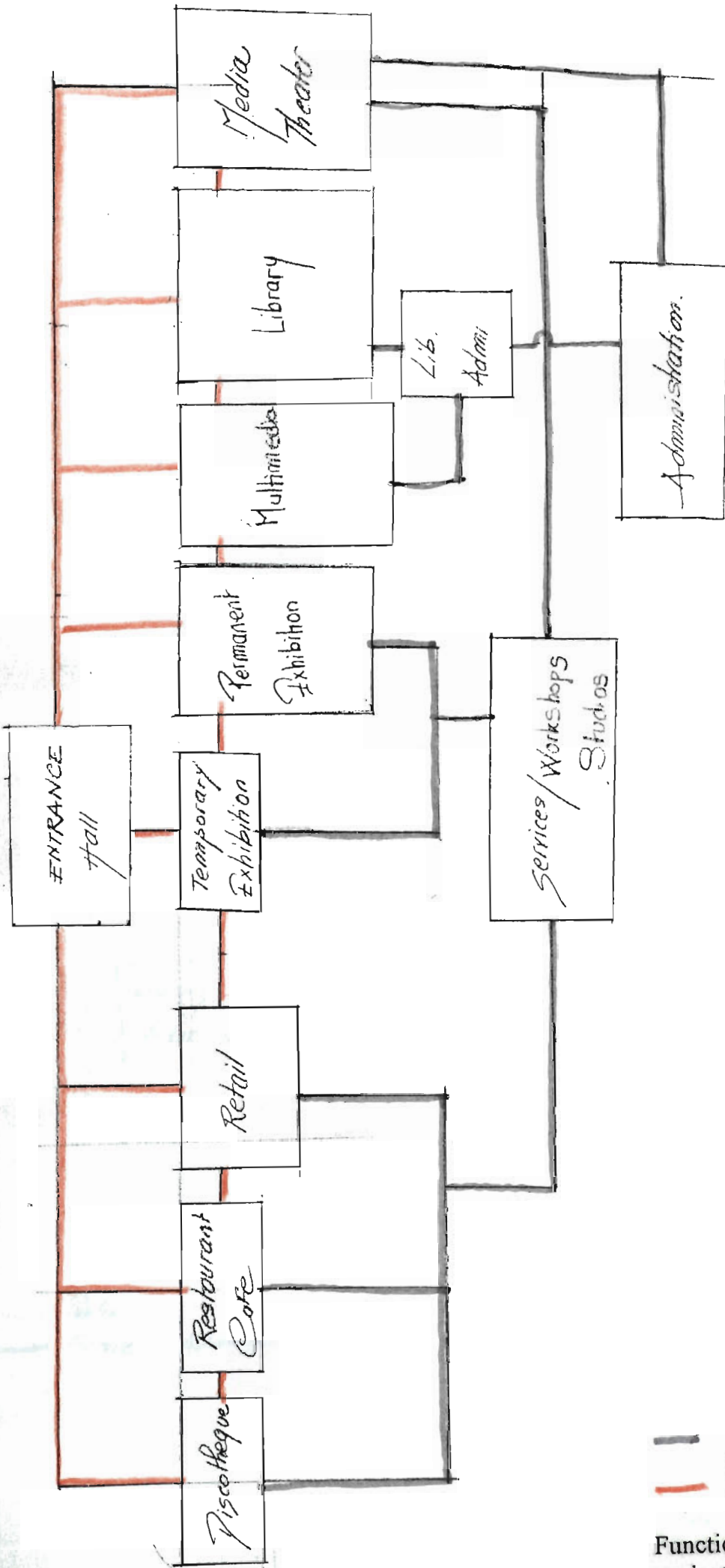
Service

Public

Functional Relationships within the project

ENTRANCE circulation

Children

Xerox

Card

seatings

Toilets

Open Stacks

Periodicals

Delivery

Binding

Processing

Library Administrat°

Cataloguing

Aquisition
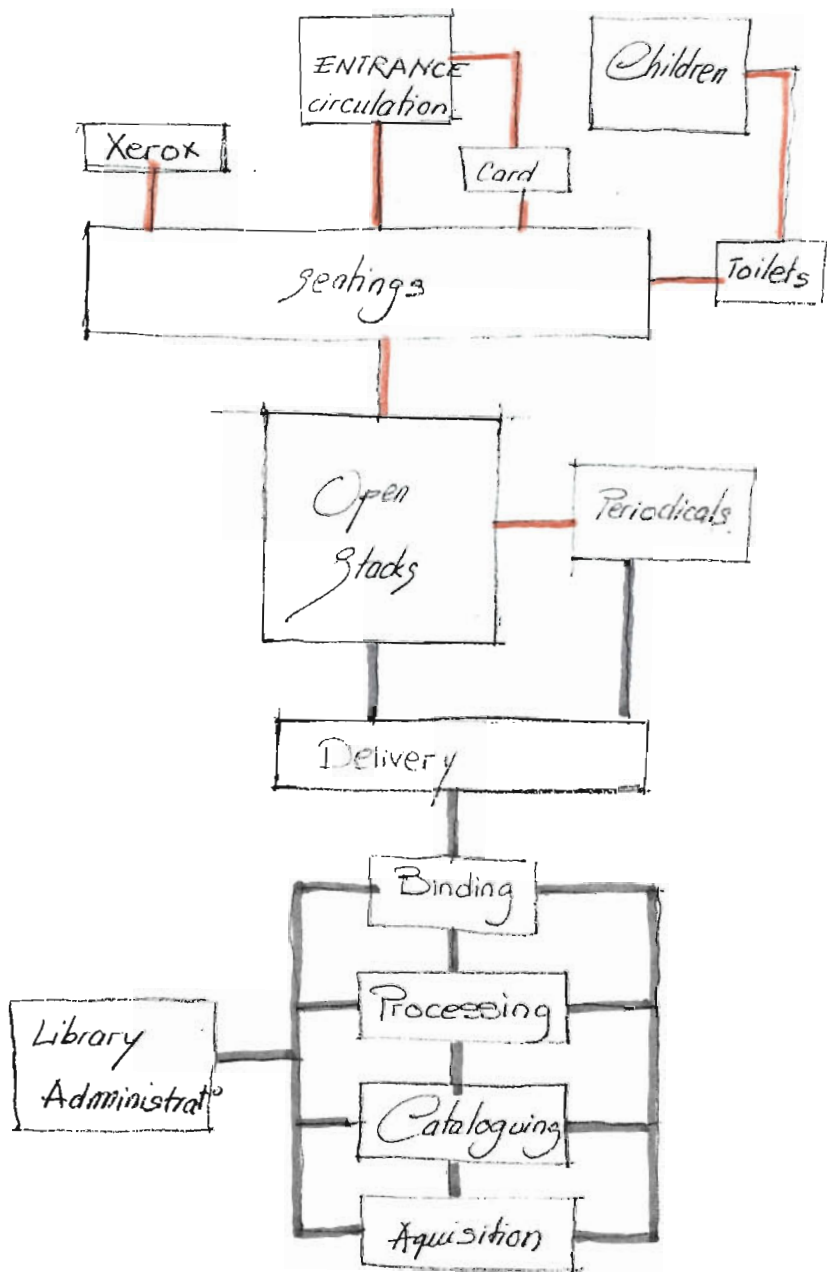
Public

Service + Administration.

Functional Realtionships in the library
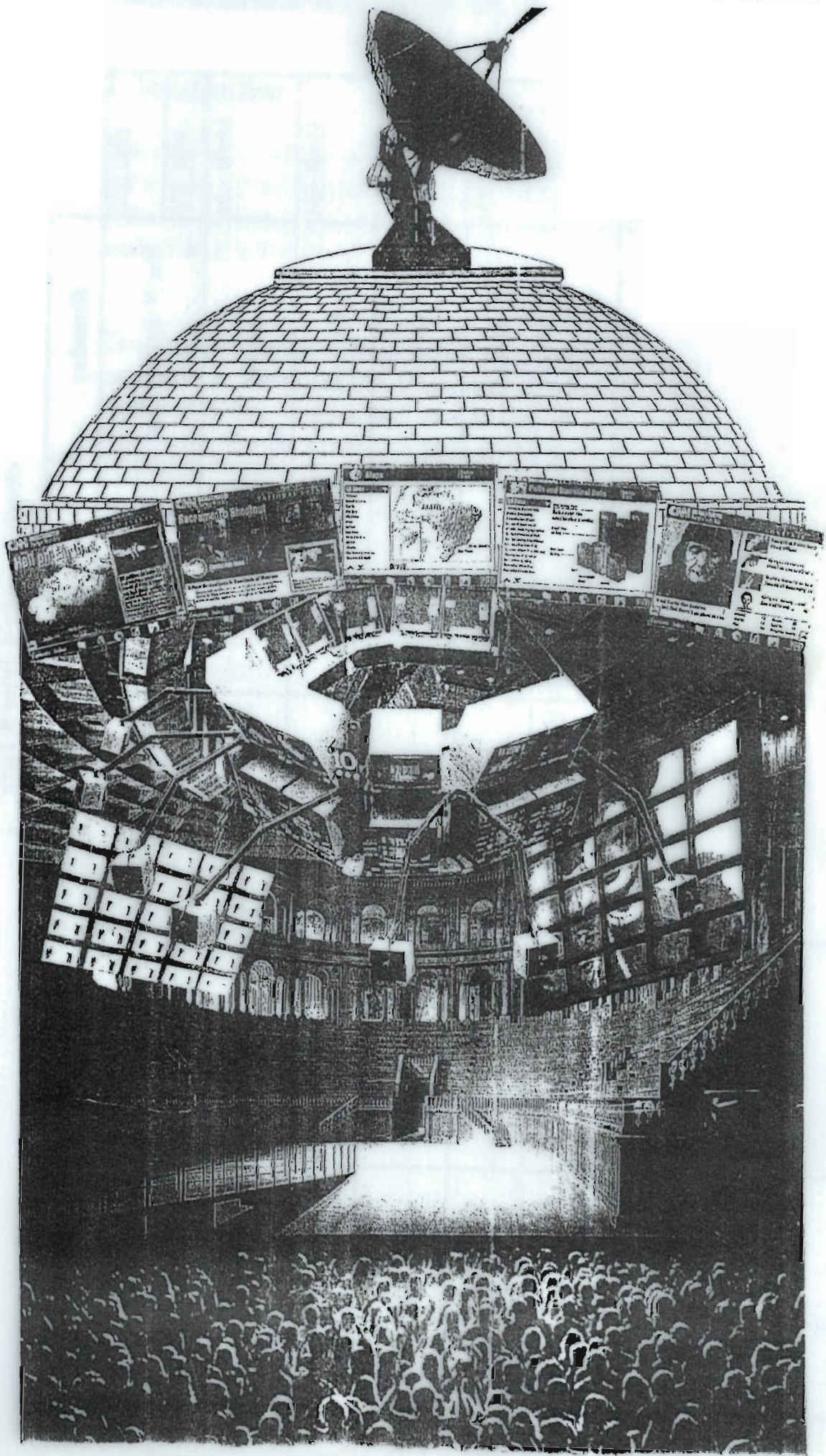
VI.   SIMILAR EXAMPLES

1. Introduction

The choice of similar projects have been done according to a similarity in the nature of the program and approach: located in an urban site and acting as information centers serving the general public. in addition to a scale that is somewhat similar to the project I am tackling.

The similar examples chosen show a variety of approaches and expressions. They include: Carre d'art in Nimes, ZKM in Karlsruhe. House of books, images and sound. and the Sony arcade in Manhattan. Institut du Monde Arabe... Although the Sony arcade is only a section of an already existing building. it has been included due to its treatment and design that elicits public interaction.

The analysis of the similar projects has been subdivided into the study in each case of the scope, site, structure, functional and spatial organization. expression and materials. A conclusion is drawn in each case of the way these examples have influenced or will influence the conception of my project .

Site

The project is located in Nimes, a medieval city in southern France with Roman origins. The building will be culturally in the heart of Nimes. It is located facing the Maison Carre, the temple of Caius and Lucius Caesar built in the reign of Augustus.
One of the architects' goal was to create a building that blends with the surrounding cityscape. To respect the scale of the surrounding buildings, five of the museum's nine floors are located underground. It refers in proportional relations to the Maison Carre, a third-century Roman temple facing it.
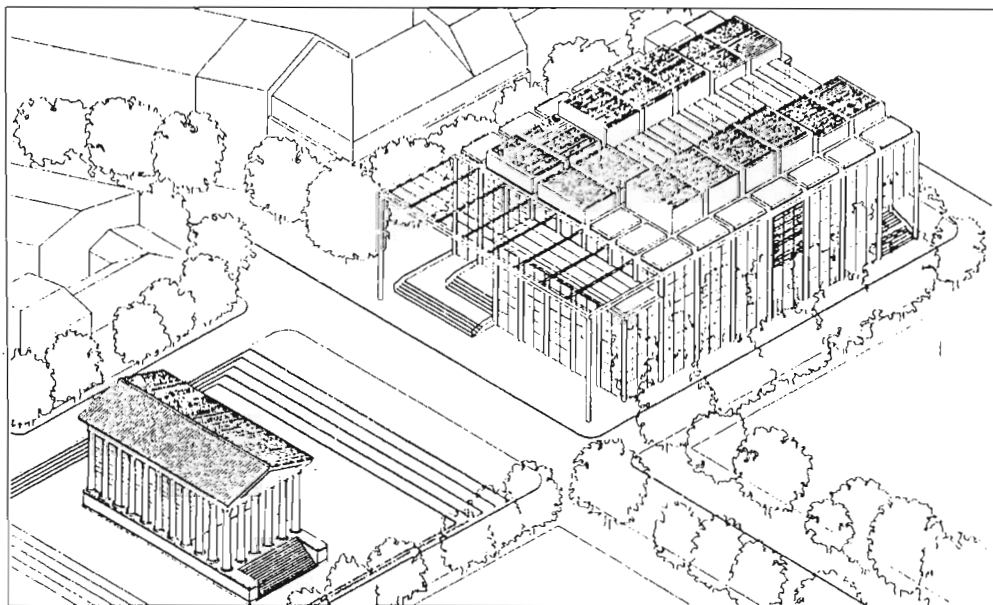
AXONOMETRIC VIEW OF MEDIATHÈQUE AND MAISON CARRÉE
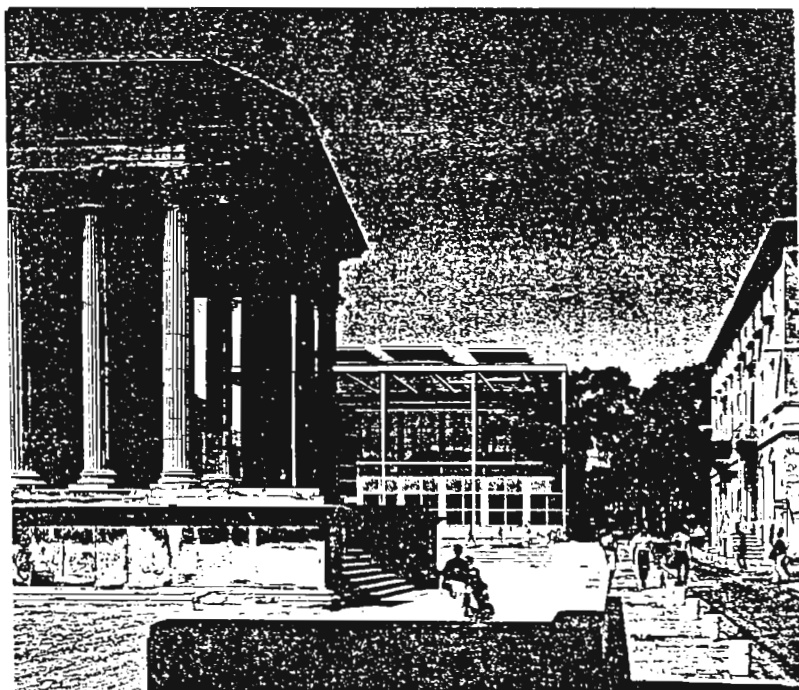
Scope

Responding to the desire of the mayor and trying to emulate a "Beaubourg center of the South".
The relationship between the building and its context, integrity of form, and quality of light are some of the primary concerns that guided the design of the project. The total area of the center is around 9000 sq. m.
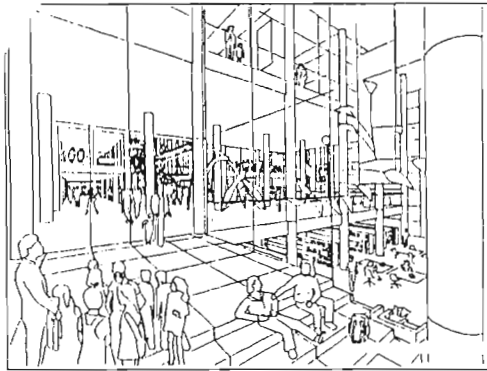
INTERIOR PERSPECTIVE ACROSS MAIN ENTRANCE
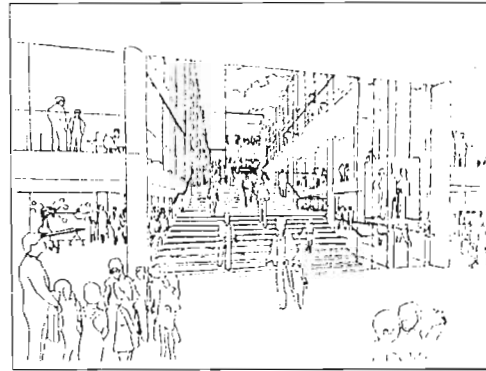
PERSPECTIVE VIEW OF MAIN STAIRCASE
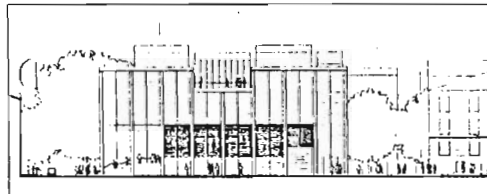
WEST ELEVATION
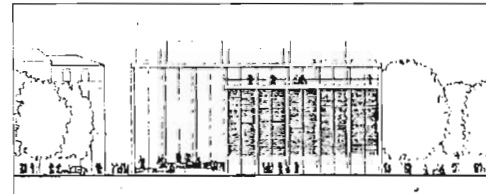
EAST ELEVATION
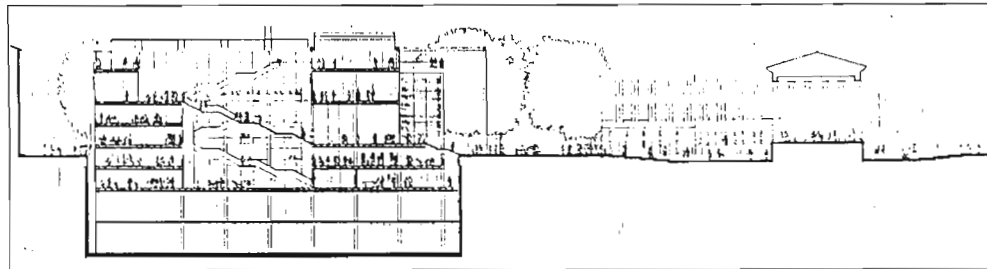
LONG SECTION THROUGH BUILDING SHOWING MAISON CARREE
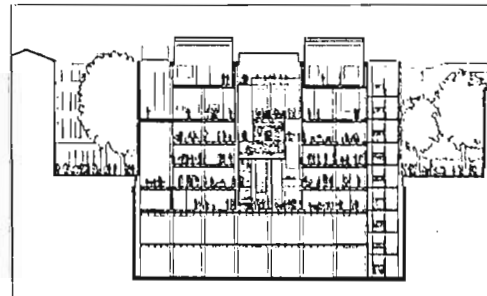
CROSS SECTION THROUGH BUILDING
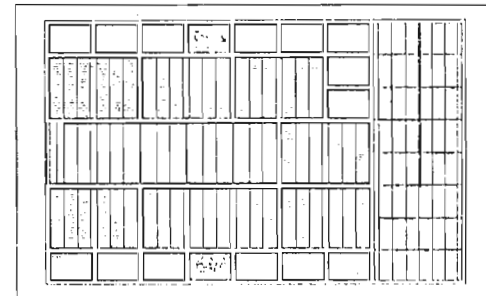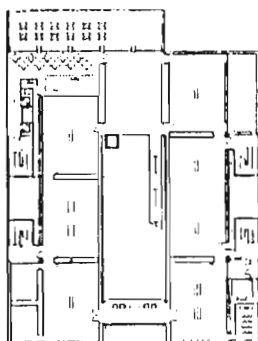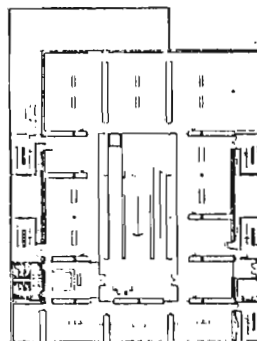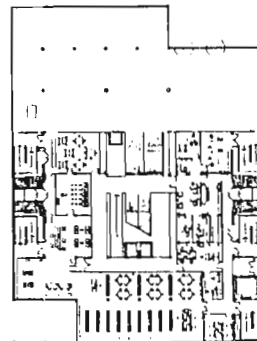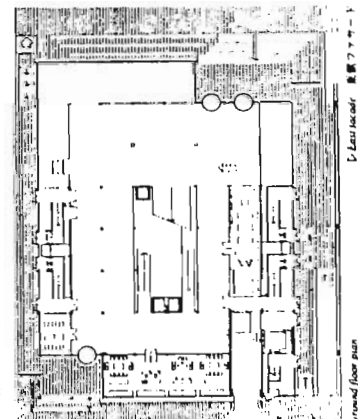
ROOF PLAN

Functional subdivision and layout

A large, centrally located courtyard has been designed with skylights, glazed hydraulic lifts, and a glass staircase, which let the daylight filter into the building lower levels. The architect states that he has been influenced by the local architecture and the traditional courtyards in Nimoise houses. Thus, this atrium which runs through the center of the building provides light, movement and orientation. A series of ramps both suspended and stepped link basement and ground levels.

The building consists of three levels above ground and three below including a car park. The underground floors are used for meeting rooms, extensive storage, and to house an auditorium.

The gallery for the permanent collection is at the top of the building in order to benefit from the immediate access to natural light flooding from the glazed roofs. Below the permanent collection are the galleries for temporary exhibitions which are lit by means of slots or light funnels that channel direct sunlight from above. In addition, lighting is provided from the side.

The mediatheque constituting the literary section of the center, is located close to the ground. It houses a reference library (360 000 volumes) as well as cultural information facilities. The spatial organization tries to demystify the activity of reading.

Mediatheque

Mediatheque

Structure

The structure of the building comprises two levels of technology: glass and steel, and concrete and stone facing. A massive traditional shell integrates structural and environmental engineering. The building is based on a 9m x 9m concrete grid structure.
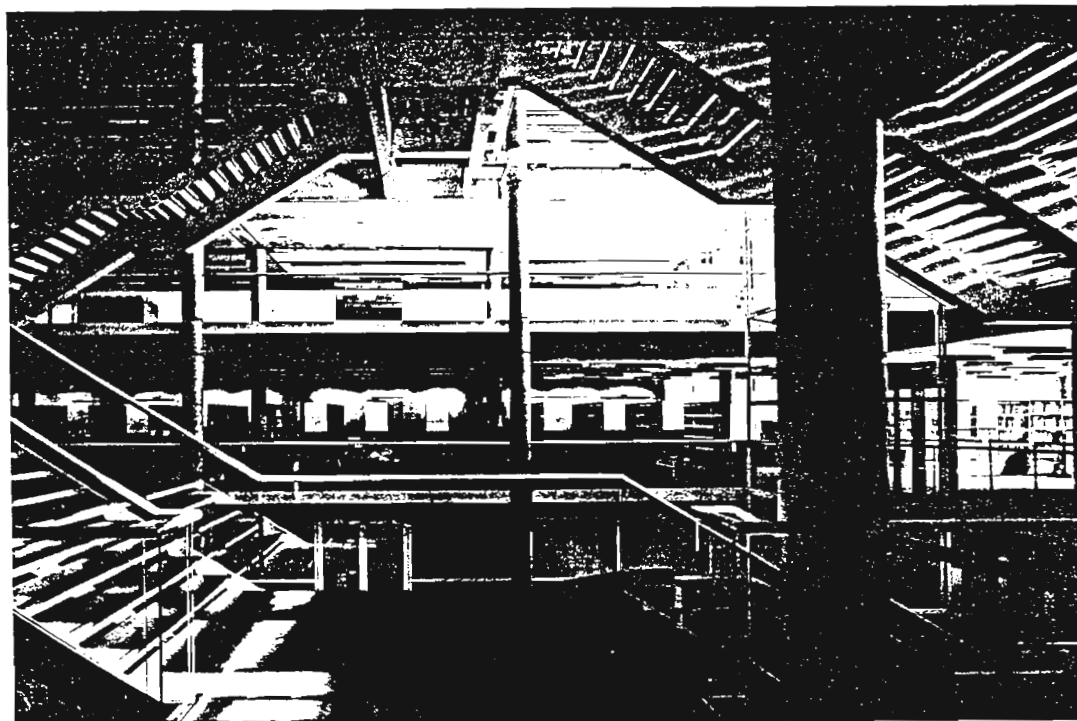
Mediatheque メディアテック
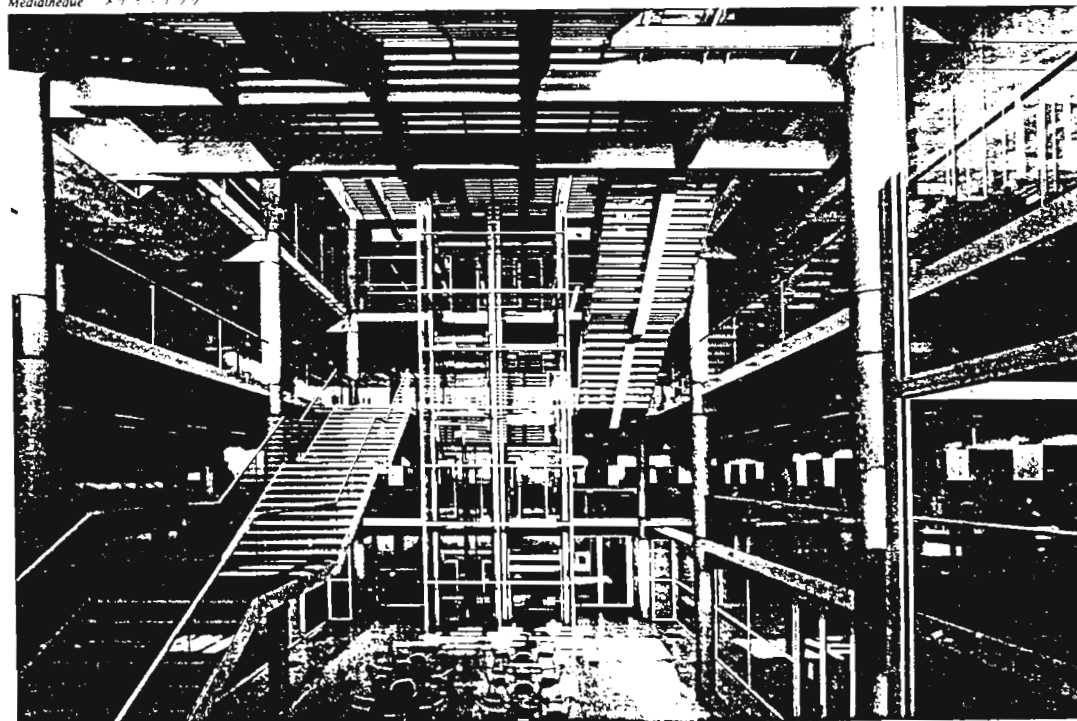
Atrium アトリウム

Materials and expression

The materials used are glass, steel that is either stainless or clad in
bronze, concrete and stone facing. Extensive use of external glazing have
been adopted.
In addition, throughout glass have been used for partitioning. Metal
louvers provide solar protection and shade.

Technology is not flagrantly stated as an expression for the building. The
architect avoided an industrial look.
In the words of Norman Foster: *"The project suggests ways in which the
new can relate to the old, can be respectful of the past but can also
speak of its own age with integrity and without pastiche."*

The facade of the building is distinguished by a large suspended canopy
and stepped entrance which defines a large symbolic and functional
public portico.

The choice of this project as a similar example for my project represents
one alternative of the way of dealing and initiating a dialogue with the
context and buildings of a certain style and historical significance. The
way to treat a project that will have a reference beyond the immediate
boundary of its confines.

Sketches
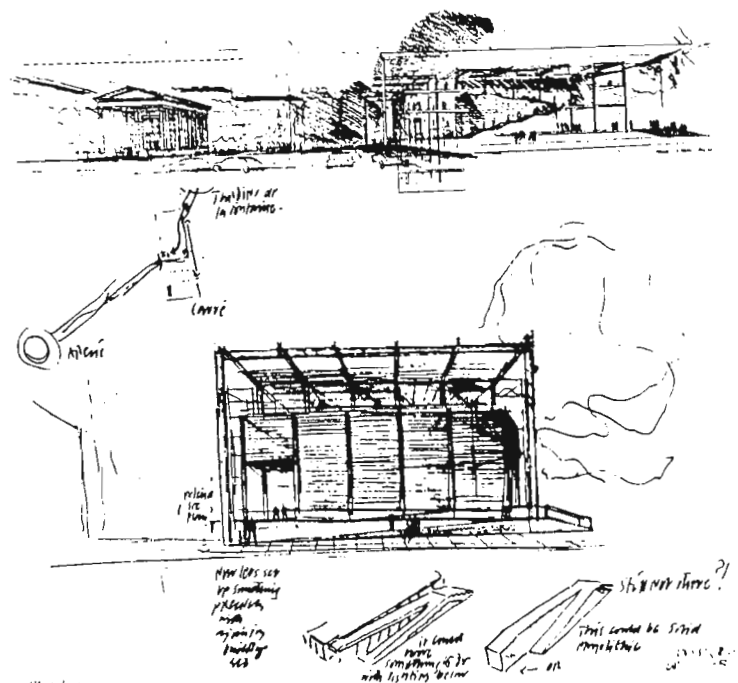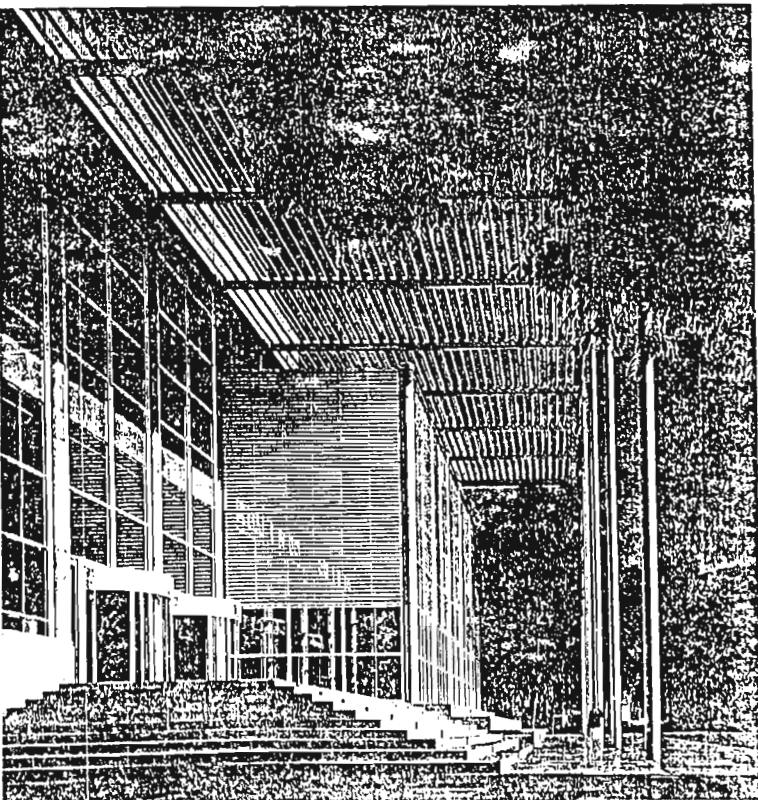
CENTER FOR ART AND MEDIA TECHNOLOGY
Karlsruhe. Germany
Rem Koolhaas

Scope

"Bringing together the arts and the new media technologies in theory as well as in practice, the main objective at ZKM is to foster the creative possibilities of a connection between the two, in order to gain insight and anticipate the needs of the next century." states Henrich Klotz.

The project will be a space which attempts to advance artistic and media technological issues and anticipate for the future.

The emphasis at ZKM is placed on the temporary and the immaterial, on the notion of a museum as an 'experimental stage' for new art, accepting the risks that accompany such a venture and trying to extend the limits of conventional museology.

The aim is to invite the visitor to cross over from the passive observation to the active participation.
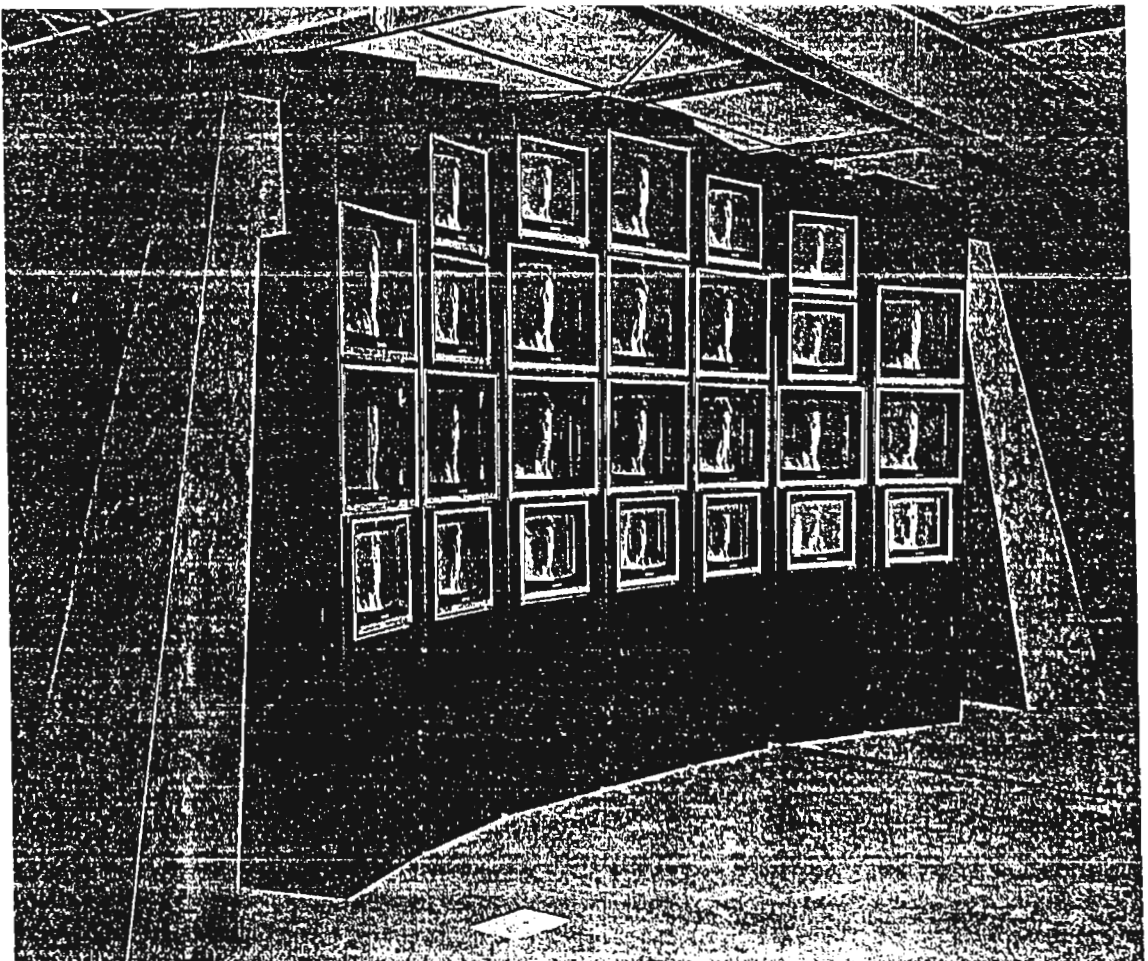
Functional organization

Koolhaas stacks the various functions according to whether they require clear-span space or not. The only spatial connection among these floors occurs on the perimeter, where stairs, elevators and escalators are located.

Zentrum fur Kunst und Medientechnologie (ZKM) is devised to contain computer research laboratories, experimental studios, film and video screening rooms, media museum, media theater, three floors of exhibition space and museum of contemporary art. The computer laboratory occupies the central area of ZKM.

This project illustrates an approach to deal with new media technology and encourage interactive participation of the users.
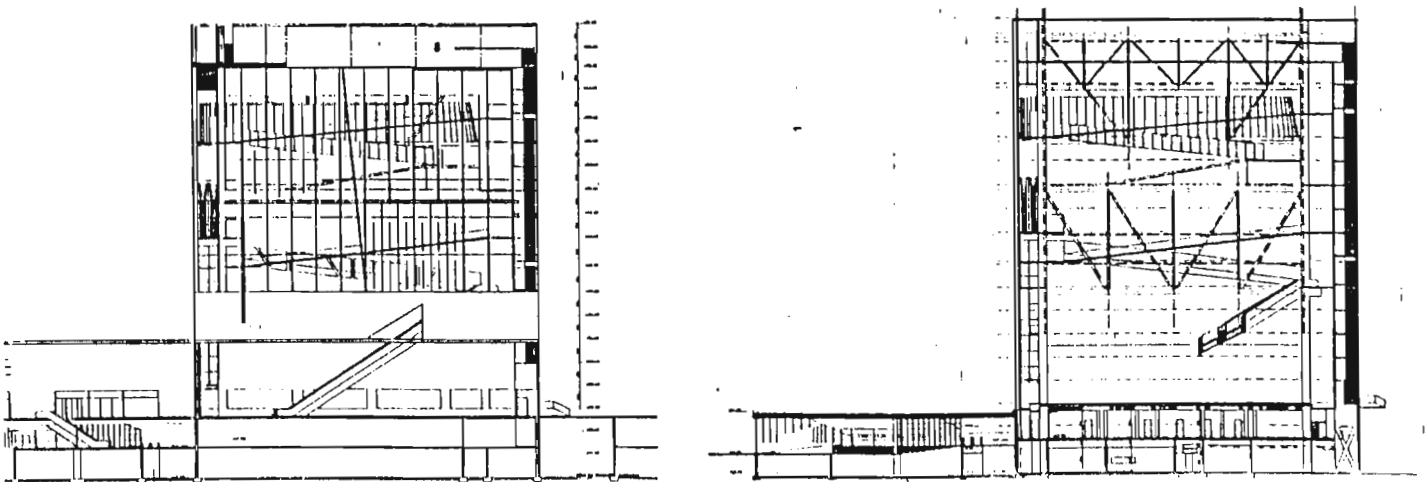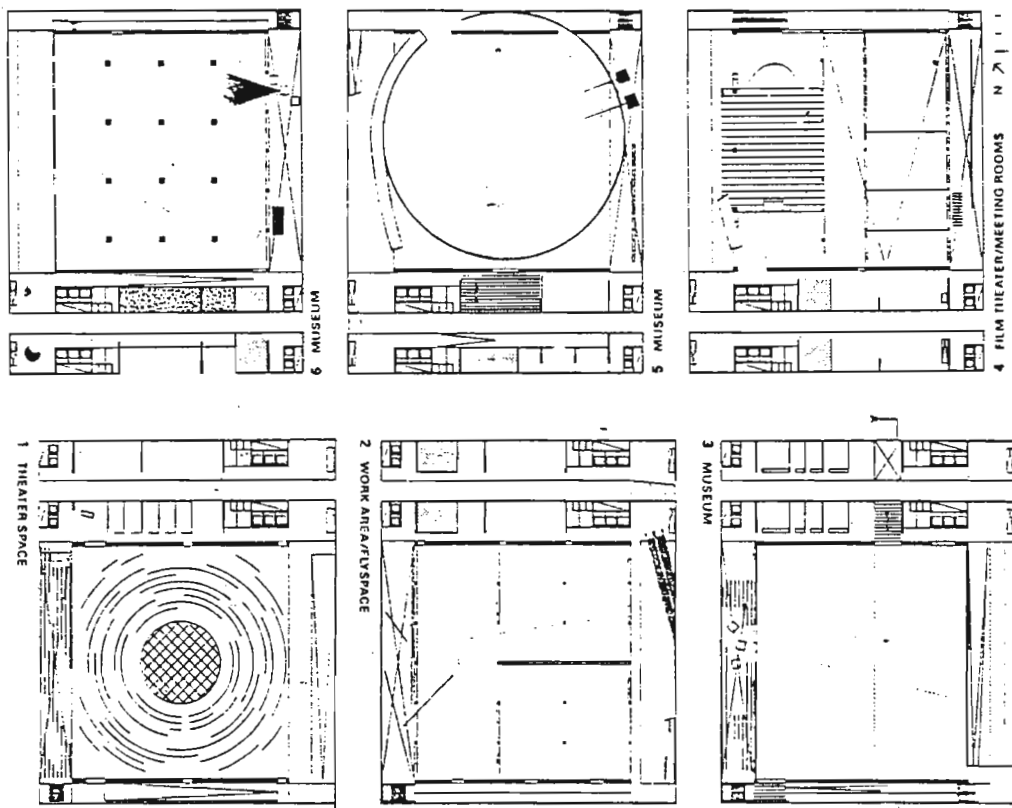
Structure

To provide clear-span space for the museum and the theater, vierendeel trusses were placed through alternating floors, with gravity loads handled by bearing walls at two ends. Wrapping around this container is a narrow, glass enclosed space, that contains stairs, escalators, ramps, corridors and theater fly space.
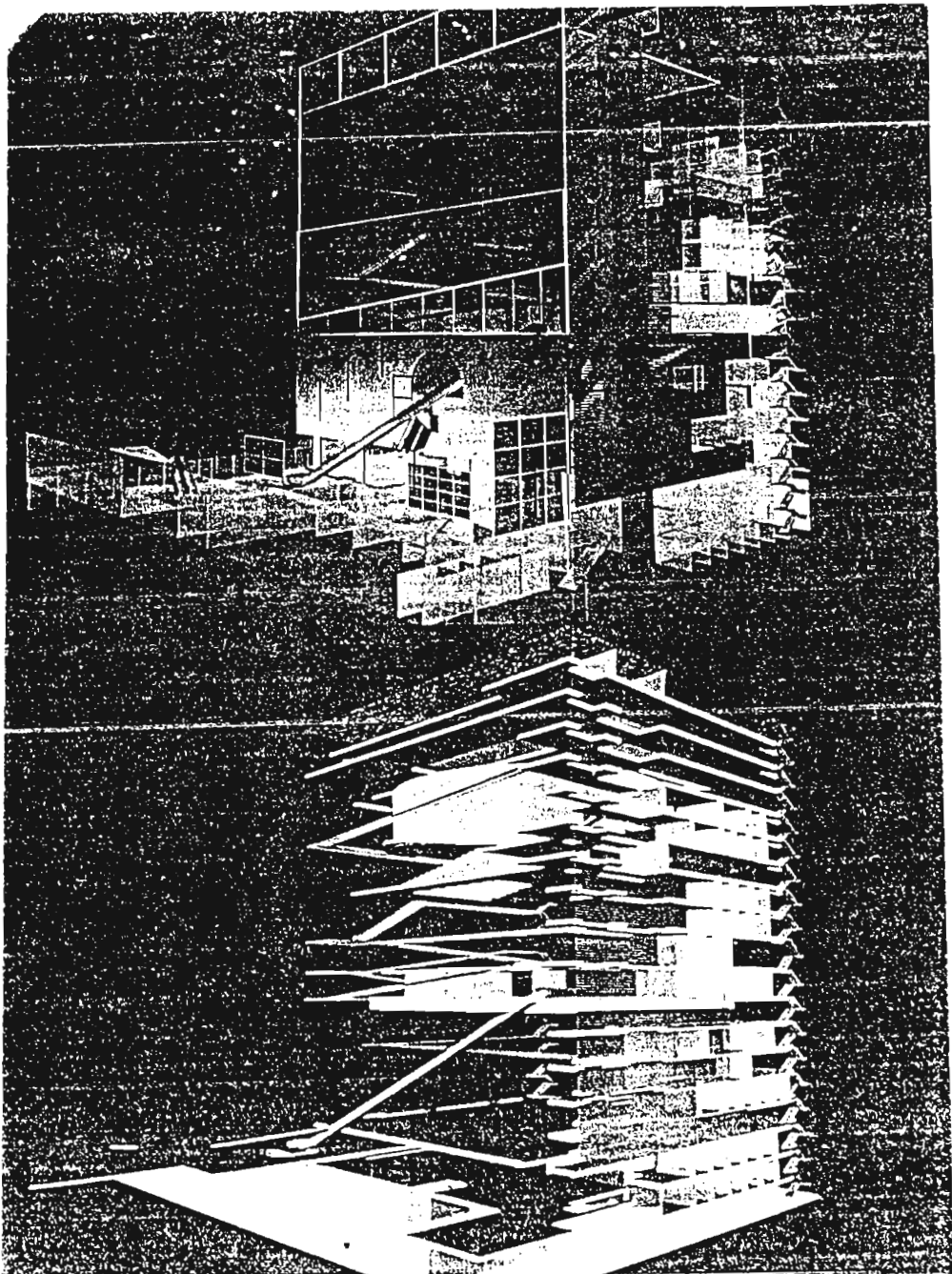
Site

The project is located in Karlsruhe in Germany. The complex acting as a counterpoint to Karlsruhe's hilltop castle across town, is linked to the main concourse of the train station.
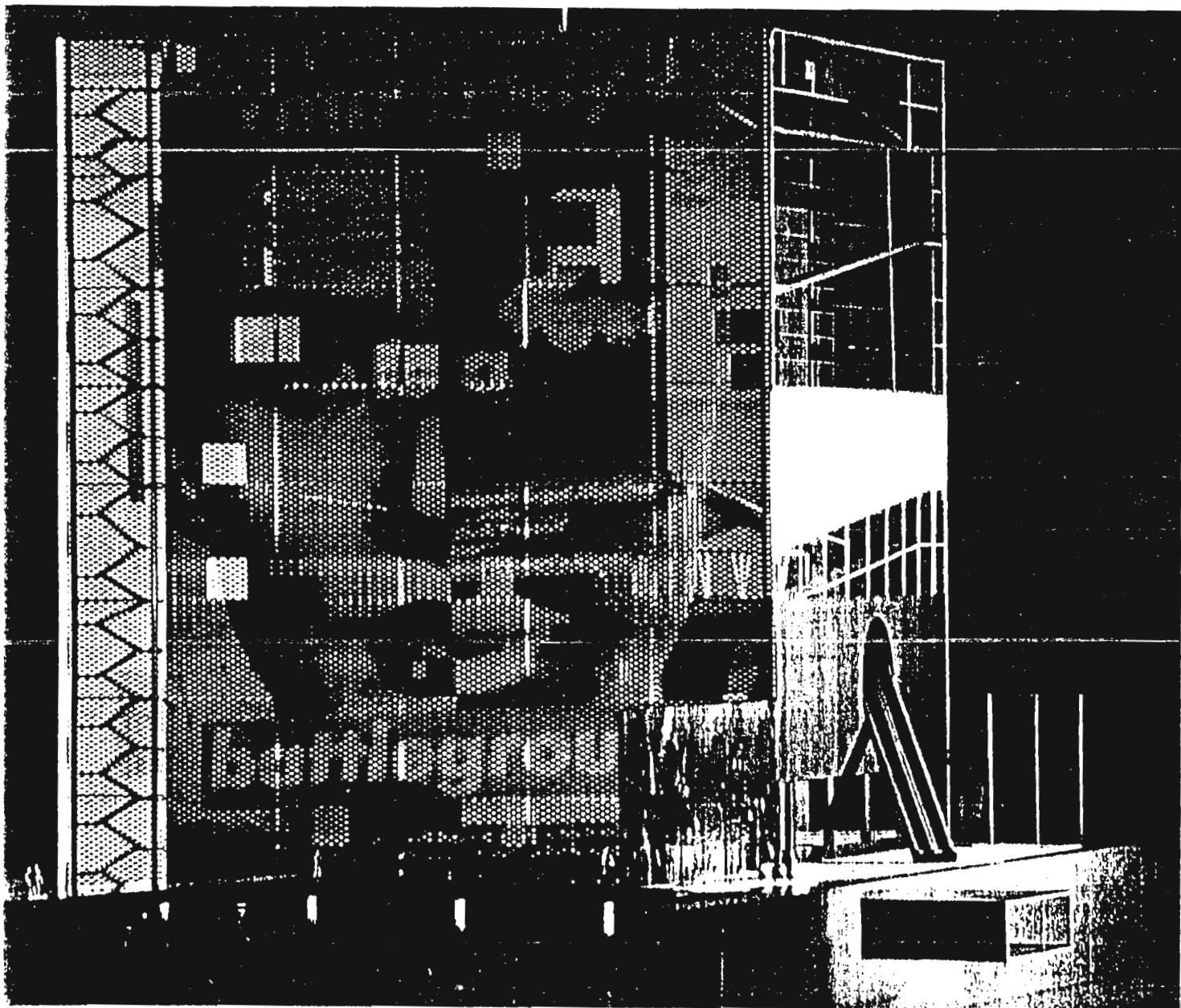
Edwin Schlossberg

Scope

The project tries to reconnect the former AT&T headquarters to the life
on the street with shops and a museum by bringing vitality at the base of
the building. Schlossberg has made Sony Plaza a museum-cum-play land.

Site

The Sony Plaza is located in mid-Manhattan, on the ground level of the
"Chippendale Building", originally designed as AT&T's world
headquarters by Philip Johnson. When Sony bought the building, it
decided to render its dark and uninviting three-story space into more
people-friendly and commercially viable. Schlossberg was commissioned
to re configure the space to include a Sony showroom, various atrium
shops, and a 4-story interactive learning center.
The space was configured as a meeting place of science and commerce.
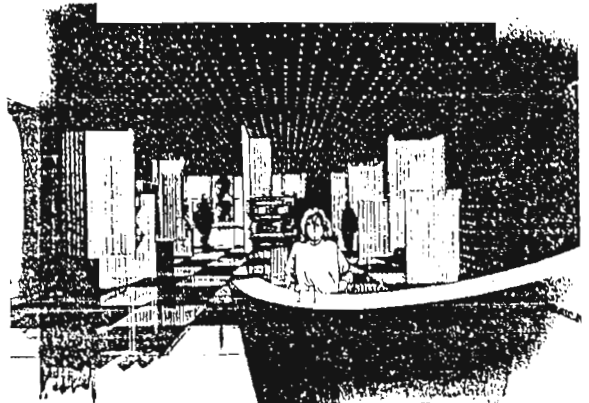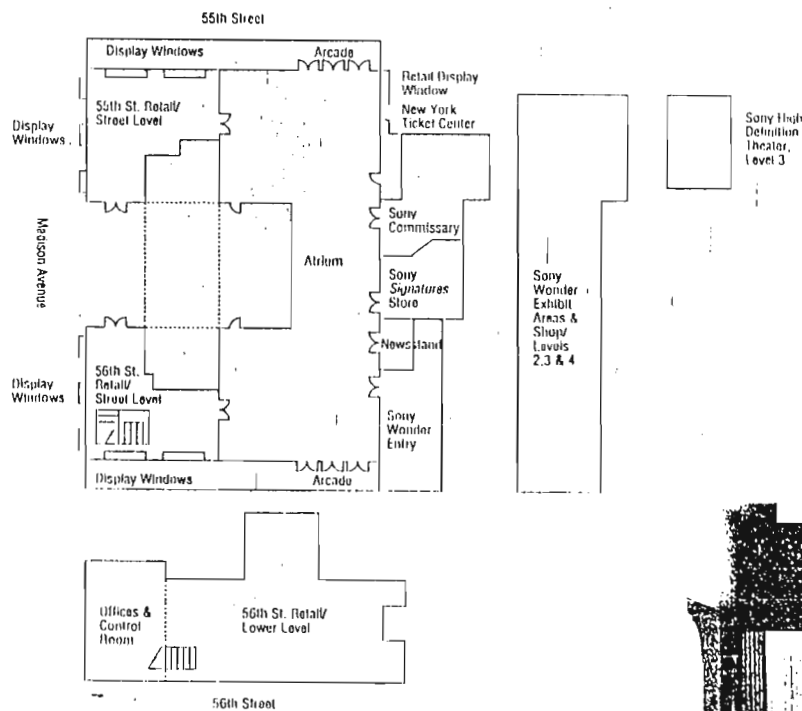
Functional organization

A communication bridge depicts a century and a half of communication history, from the invention of photography in the 1830s to a state-of-the-art high-definition screen.
The architect chose the theme of a back-stage: a palette of materials, flexible truss and display systems, drapes and banners, and lighting techniques have been used to evoke the impression of fly spaces of a theater.

Interaction is elicited in this project; an interaction that will change the way people relate to each other.
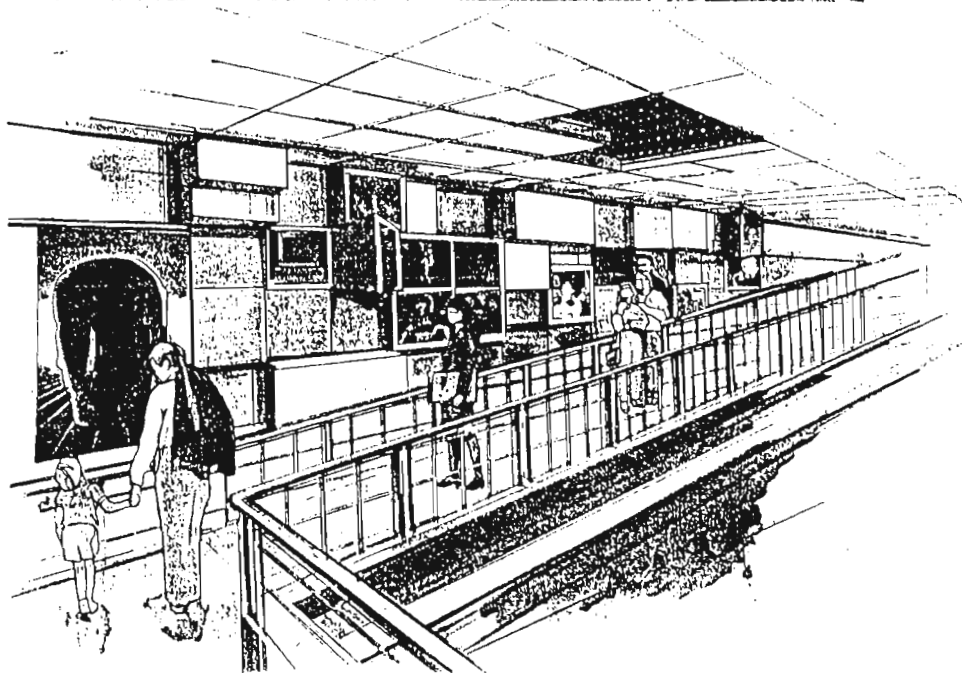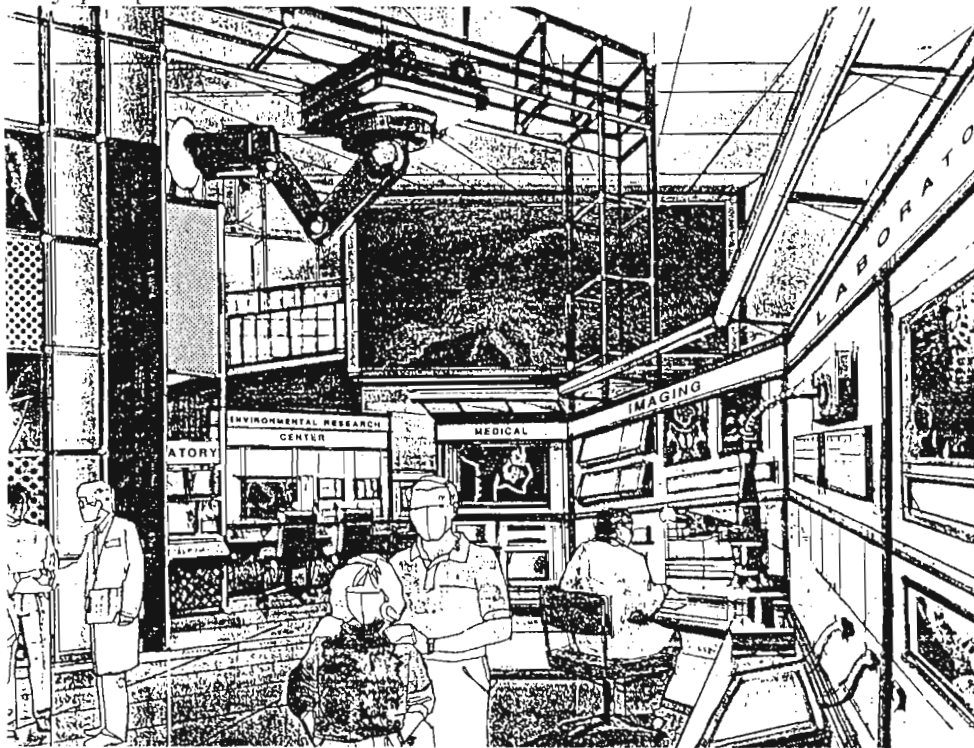
Mario Botta

Scope

The aim was to create a cultural institution or rather a multimedia center that shall act as a container housing audio-visual facilities for the general public use.

Mario Botta envisioned the building as a signal for the city. *"I did not want the function to determine the image. I preferred to answer to the city with shapes and forms, then put the required functions into the given floors."*

The total area of the project is approximately 5500 sq. m.

2
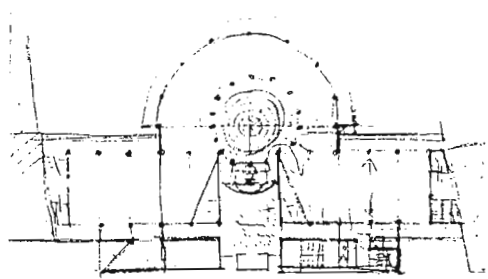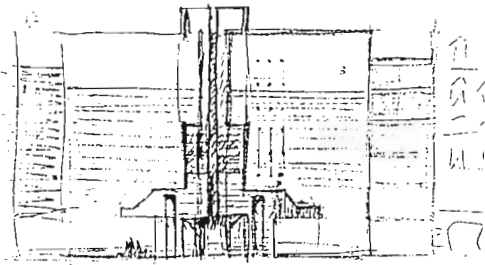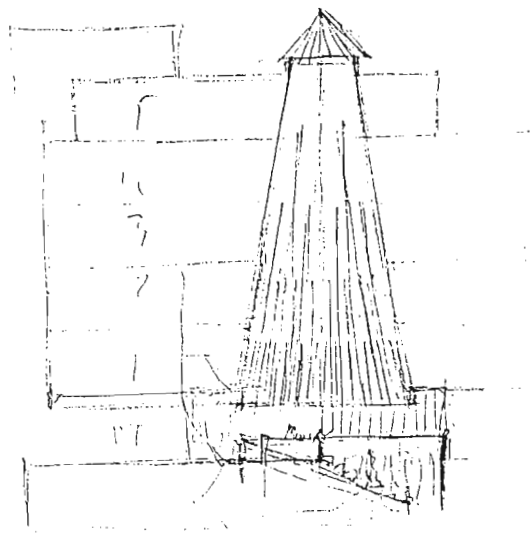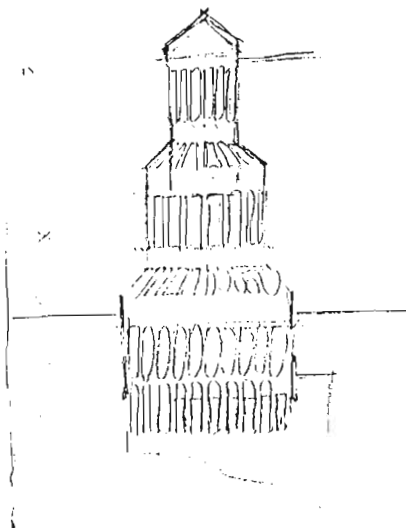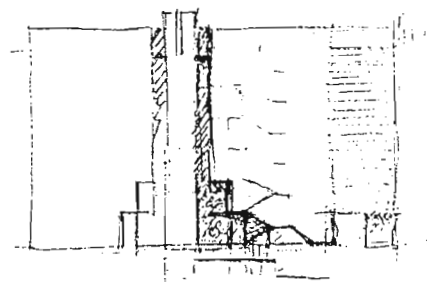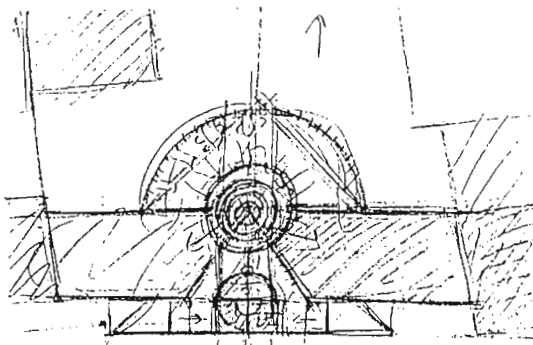
Site

The building is located in the satellite town of Villeurbanne, neighboring Lyons. The edification of a prominent public building represents an opportunity for the town to reassert its proper identity.

The building occupies a lot that is between two already existing buildings on a public street. The architect faced the problem of clashing styles: one of the buildings is modern and the other is flamboyant baroque.

Functional organization

The focal point of the composition is a light well. This light cone unites both the diverse functions which occupy the seven floors and the different parts of the building.

The functions are subdivided horizontally and organized around this cylindrical atrium. The governing idea is that visitors entering from the urban space would be able from the first glance to comprehend the whole building.

A 100-seat auditorium, semicircular gallery, and exhibition hall occupy the basement. The first floor reception area leads to audio collections and exhibit space in the wings. The second and third floors house adult collections; children's materials are on the fourth floor. The library houses 200 000 books. Staff only is allowed in the fifth floor archives. The sixth floor houses administration, a bookbinding workshop, a caretaker's apartment.
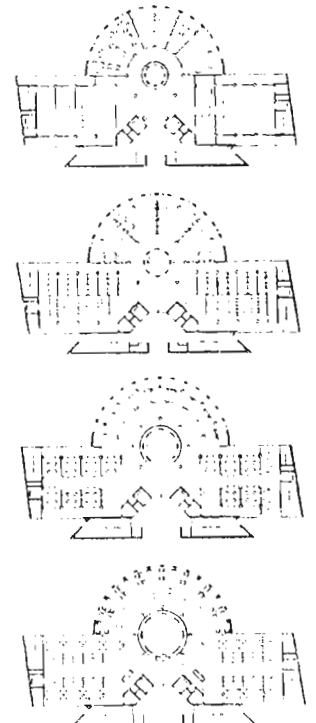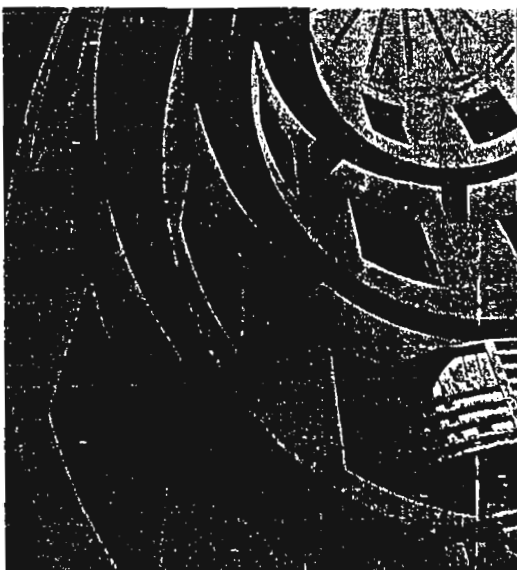
Structure

The structure of the central feature that is the light well is composed out of
five overlapping cylinders. measuring 3.10 meters across at the top and 8 meters at the bottom.
Each segment on each floor is prefabricated in reinforced concrete. These panels. whose total weight is 193 tones. rest on pilasters.
The rest of the structure is a post and lintel with an 8 m span.

Materials and expression

The building takes a wedge like form. rendered in strips of limestone. The facade has a very planar character establishing a continuity along the street wall. An axis of symmetry cuts it in half. The functions placed along this axis like the lobby, reception, staircase and atrium are exposed to the exterior through translucent glass blocks.
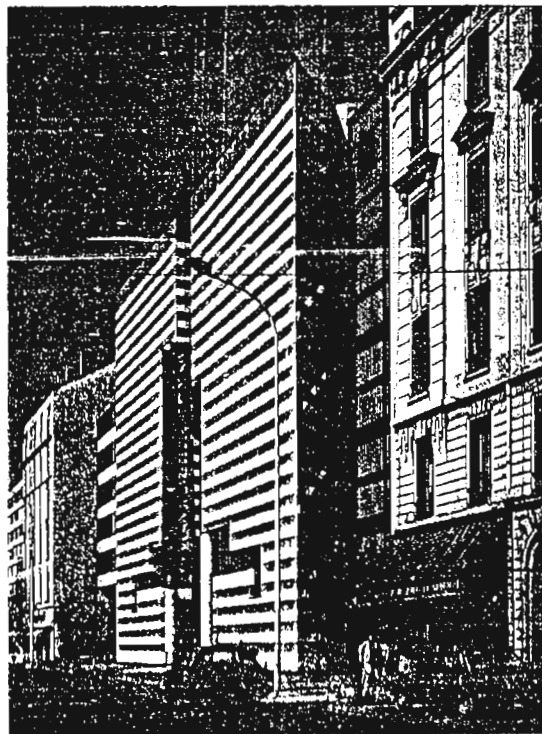
This project illustrates a manner to deal with diverse functions and the way to compose them and unite them. In terms of context it differs from the project at hand in the terms that it is an in fill building, while the project I am tackling is in a corner situation.
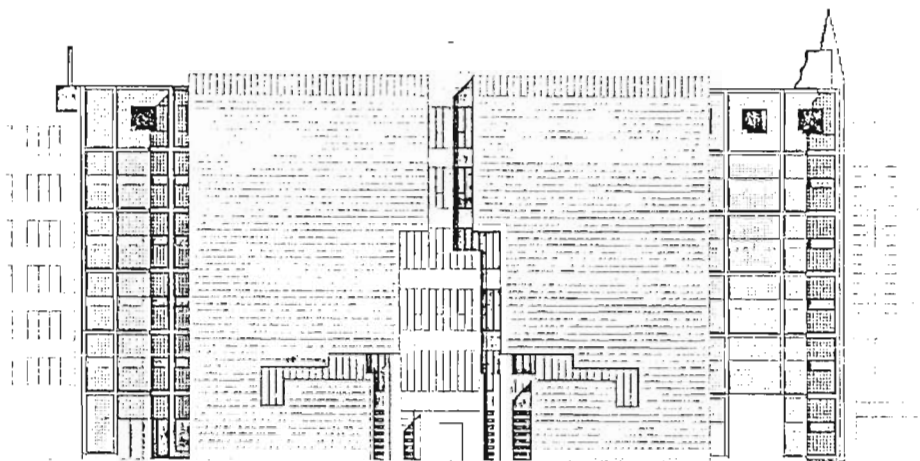
Façade de l'édifice sur le cours Émile-Zola.
// Elevation on cours Émile Zola.
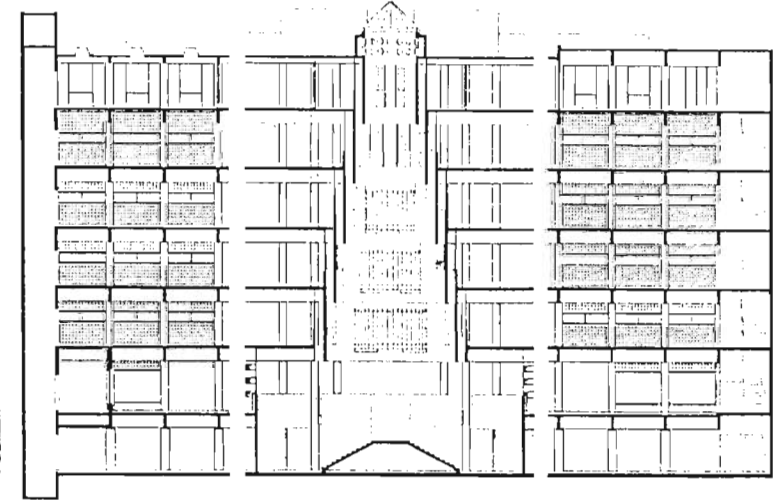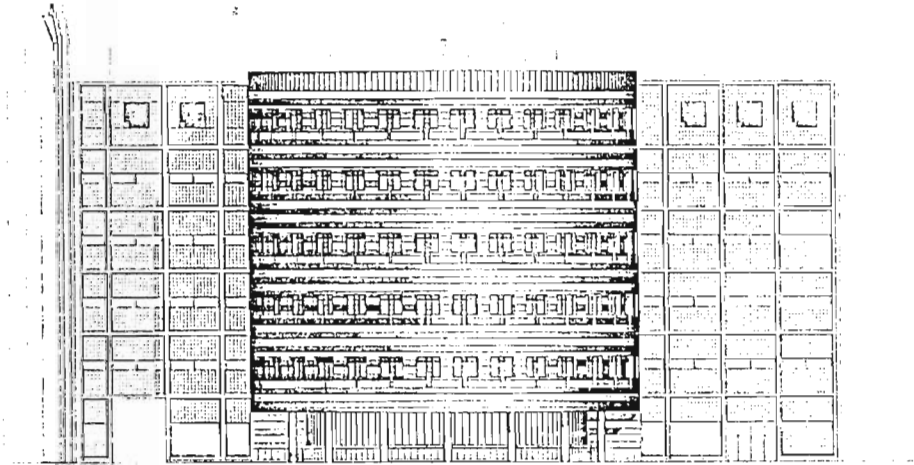
INSTITUT DU MONDE ARABE (IMA). Paris. France

Jean Nouvel

Scope

The building is the physical manifestation of the friendship between France and the Arab world. It elicits a cultural dialogue, communication and cooperation between the two.

Site

The building is located on the Boulevard Saint Germain in Paris. France. The site is curved in shape. It is on the border of two contrasting urban textures: one urban and the other historic.

Functional subdivision and layout

A main circulation core is located at the center, with the staircases pushed towards the facade, thus creating a defined circulation zone with the spaces grouped around. The visitor is able to see the various functions from the reception hall.

The IMA houses divers activities: a museum, a 100 000 book library, reception space, exhibition space, cafeteria, meeting rooms, supporting facilities and offices.
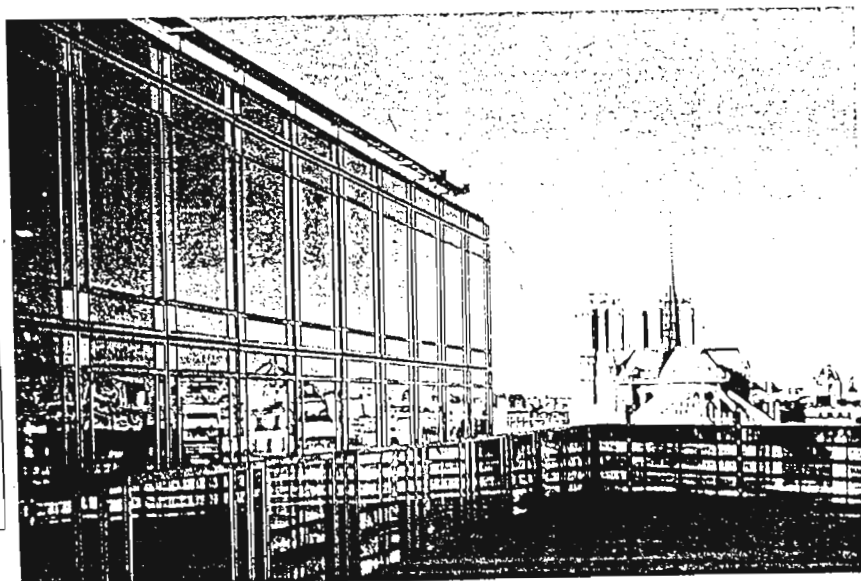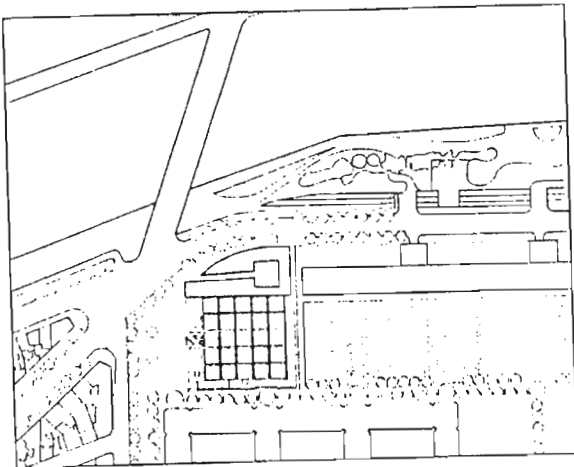
Structure

A steel structure is adopted. The system of structure is post and lintel. On the southern side, circular steel columns with a cross section of 80 cm diameter are used to hold a three dimensional steel truss spanning 12 m. At the northern side, circular steel cross section of 40 cm diameter hold an I section prefabricated steel beams spanning within a range of 4-13 m.
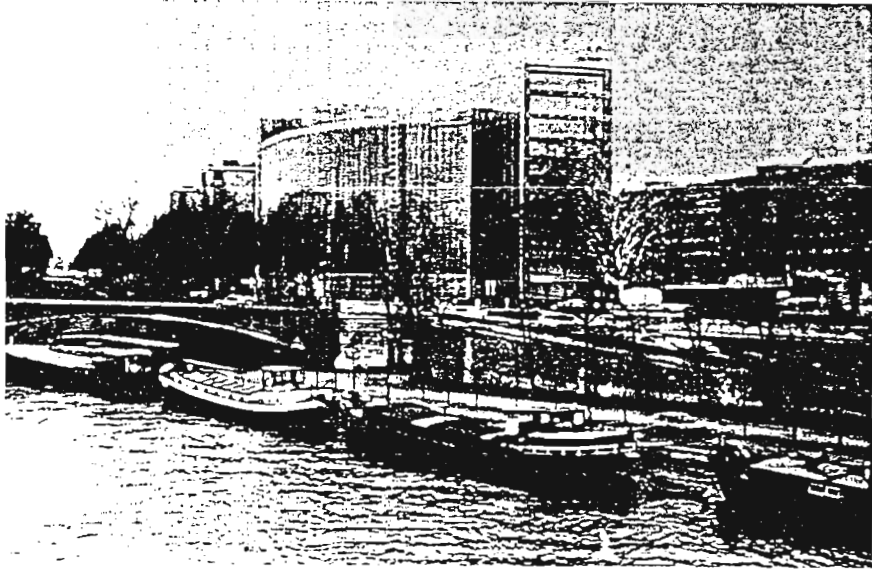
Materials and expression

The building is split into two: its curved (northern) half is following the line of the Seine. while the block behind is running parallel to the university buildings.

The split results in a driveway between the two parts that is exactly in line with the towers of the Cathedral of Notre Dame. The drive way ends in an internal courtyard covered by translucent court covered by translucent stone.

On the southern facade. a glazed facade of 242 panels constitutes an adjustable mesh of 27 000 diaphragms regulating the passage of light according to the intensity of the sun. The facade is a repetitive technological geometry that makes use of one of the motifs of Arab Architecture the 'mecharabia'.

On the northern facade. an outer skin facade of steel and glass. is held by the internal structure. Horizontal steel strips emphasize the curvilinear shape.

The interest of this project resides in the way it has tackled the arab identity and heritage. It did not only evoke it, but also combine it with the modern technological innovations and approaches.
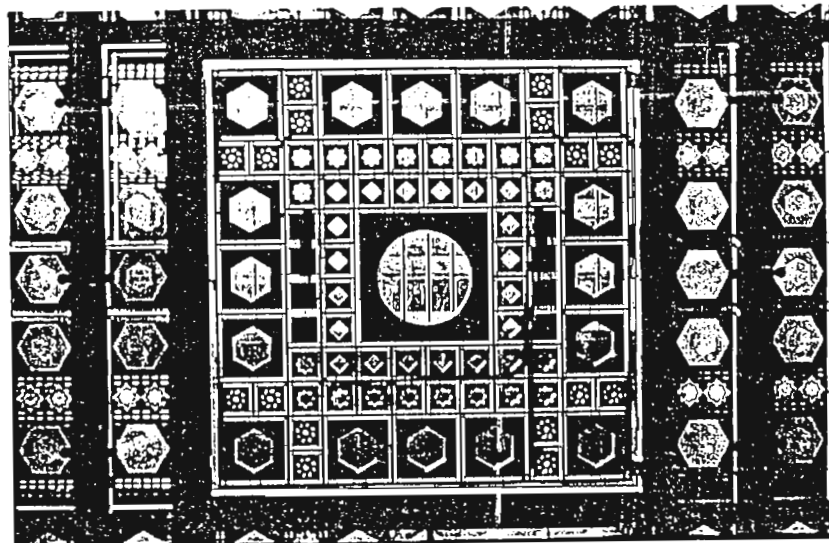
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