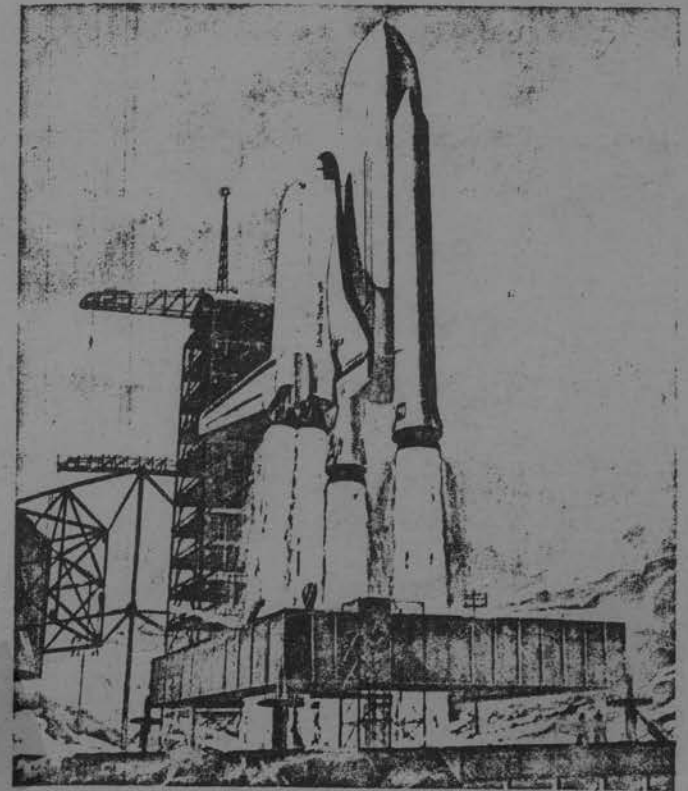


Thesis 1979R
S170

Architecture Library

Oklahoma Space Center

J. Soter



project

Oklahoma Space Center

client

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Oklahoma City, OK 73111
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thanks

Traditionally this page is where the student thanks all the people who had an impact on the project. So here goes:

To my parents Mr. and Mrs. Joseph Soter for their moral and financial support during the crises a project such as this involved.

To my advisor Professor Erdely for letting me test my own wings and demanding quality throughout.

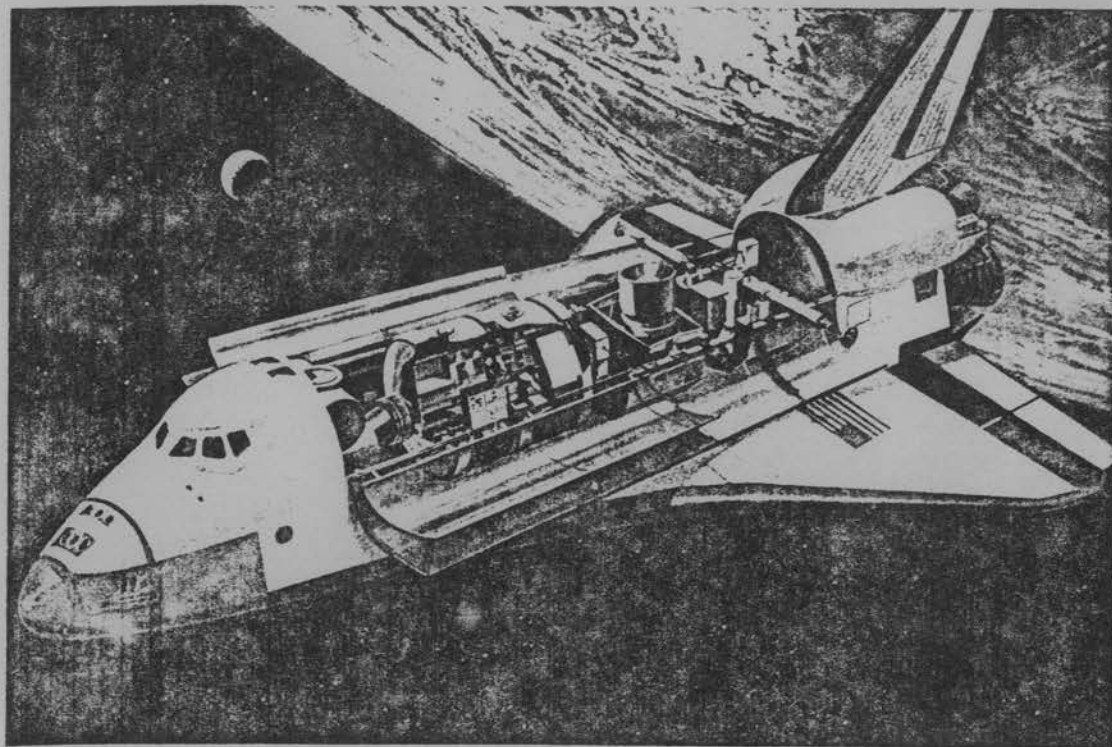
To my client Dr. William Mac Sudduth who took time from his busy schedule to help this student who showed up at his office one day with an unusual request.

To Messrs. Edward O. Buckbee and Scott Osborne whose generosity was fundamental to the program.

And finally to all these people whose encouragement, help, and inspiration proved to be a valuable resource through the long hours of work.

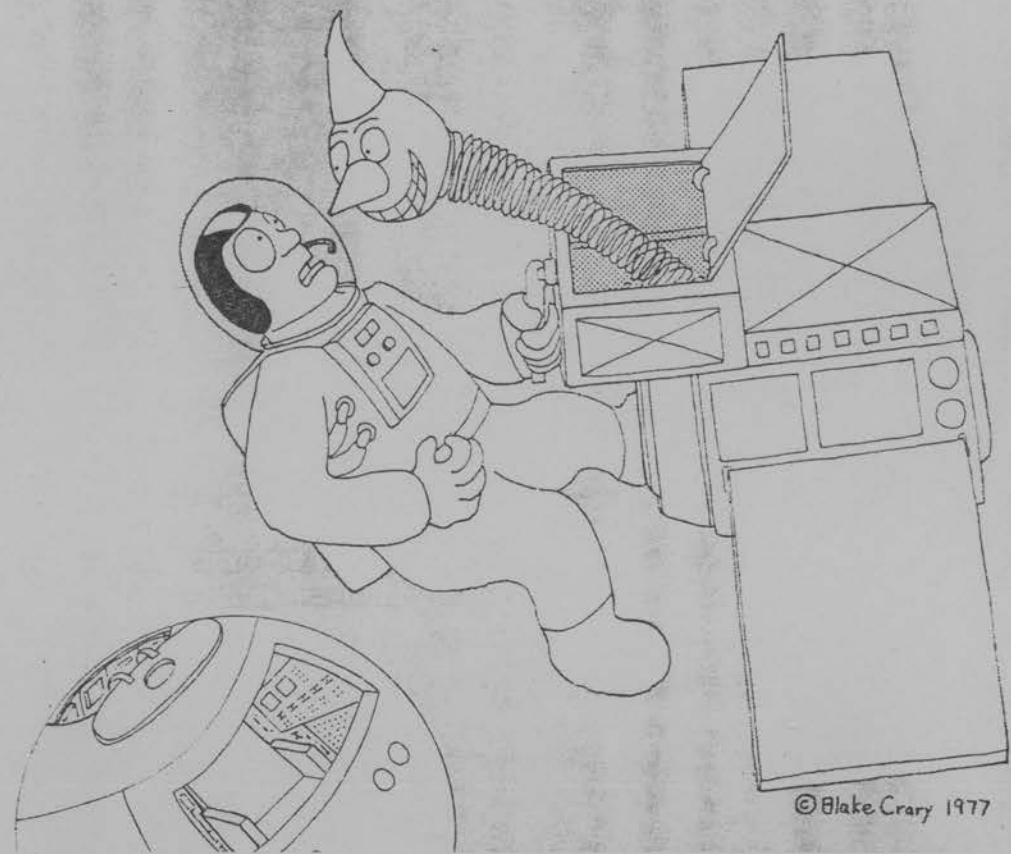
Brenda Presley
Marsha Dodson
Camille La France
Gordon Thoms
Jim and Pat Soter
Jim and Betty Schepens
The Southwest Side

David Crowe, A.I.A.
Louis Bass
Isao Tomita
Werner Von Braun
Analog Magazine
The Playmates of the Year
Mr. Mons



Introduction

This report is in partial fulfillment of the requirements for the degree of Master of Architecture. It is a sequence called Professional Project. In this sequence the student simulates the role of a project architect. The student arranges to have a person act the role of client. Programming is accomplished in the fall semester and design is performed in the spring. This book is arranged in two sections text and appendix. The text is comprised of programming requirements, the appendix is comprised of graphical references and the final design solution.



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Drawn for NSI by member Blake Crary, San Jose, California ©1977

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Larry Todd



Wrong attitude

familiarization

This section is the familiarization process. It is the product of a literature search and initial conversations with the client. Its purpose is to identify general areas of concern and to determine the scope of the problem.

The space center is similar in concept to a science museum. It is a hands on facility which teaches the public through active participation. By turning dials, moving levers, riding simulators, playing games and viewing exhibits people learn what its like to live and work and play in space. The center also supplements classroom teaching by providing programs demonstrating principles which are not within the scope of most school curricula.

The purpose of such a facility is to educate the public about the immediate benefits of space activities, to clarify misunderstandings about "outer space", to possibly inspire young people to pursue space careers, and generally to raise the collective consciousness about the fact that the age of space exploitation is upon us. This is to be done in an entertaining and informative manner.

The space center is people. The staff and the visitors make up the user group.

Initial research suggests the center may be organized along the lines of a museum. Below is a typical museum organization chart. Immediately following is a list of staff positions at the Omniplex and a departmental breakdown.

At my next client meeting I wish to determine the exact hierarchy of the Omniplex staff. My technique will be to ask Mr. Sudduth to compare the sample charts with his organization and make changes or supply me with his own chart if it is available.

Upon determining the staff functions each job will be analyzed for the following data:

personnel

Table 2. Anticipated Staff and Estimated Salary Levels

Department and Position	Estimated Salary
<u>Administration</u>	
Executive Director	\$27,000
Assistant Director	17,000
Secretary to the Director	10,000
Gift Shop Manager	10,000
Public Relations Coordinator	10,000
Receptionist	6,000
Secretary	7,200
Bookkeeper	10,000
Shop Foreman	9,000
Print Shop Manager	6,000
Building Engineer	7,200
Construction ($\frac{1}{2}$)	3,600
Maintenance ($1\frac{1}{2}$)	9,000
Security (2)	12,000
Volunteers & Membership	<u>10,000</u>
	\$154,000
<u>Exhibits</u>	
Exhibit Director	\$15,000
Assistant Exhibit Director	12,000
Graphic Artist (2)	20,000
Electronics (half time)	5,000
Exhibit cleaning (half time)	3,000
Carpenter (half time)	<u>3,600</u>
	\$58,600

personnel

Education

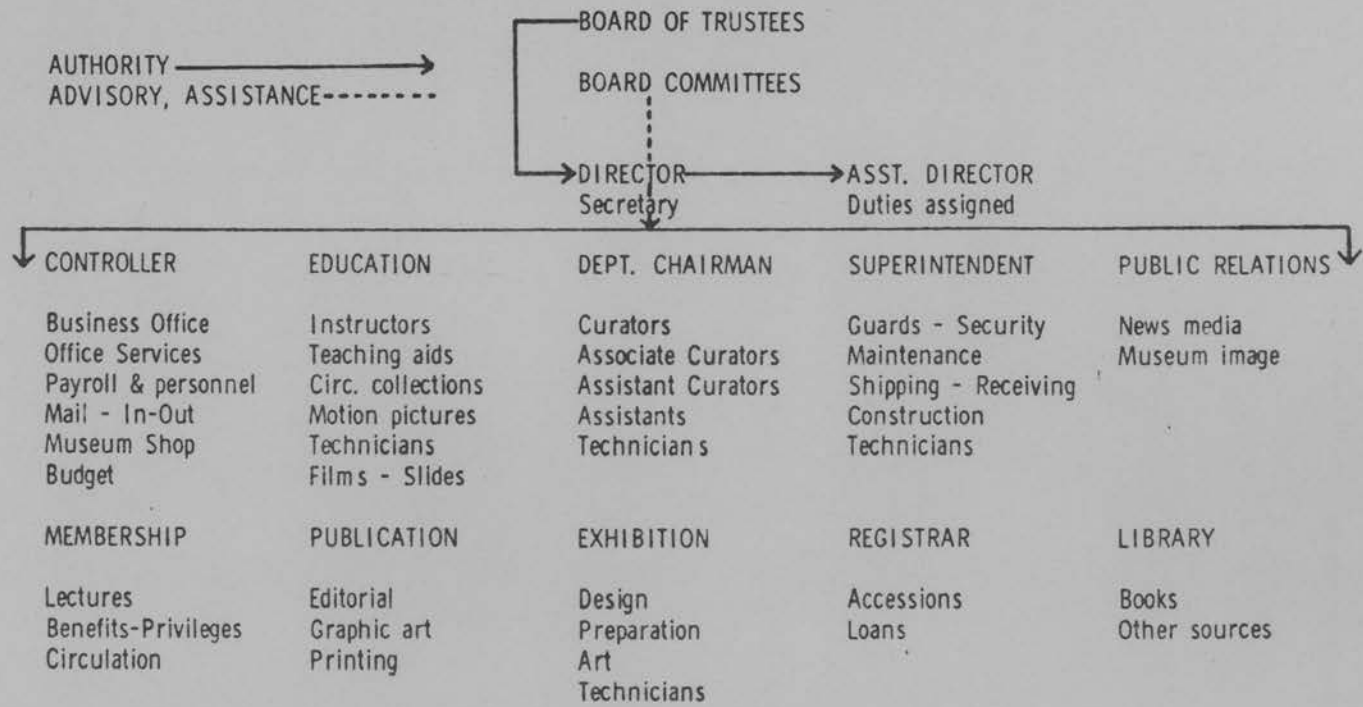
Education Coordinator	\$15,000
Elementary School Specialist	10,000
Early Childhood Specialist	10,000
Science Development Consultant	12,000
Bookings and Secretary	7,200
Part-time Teachers (10)	<u>10,000</u>
	\$64,200

Planetarium

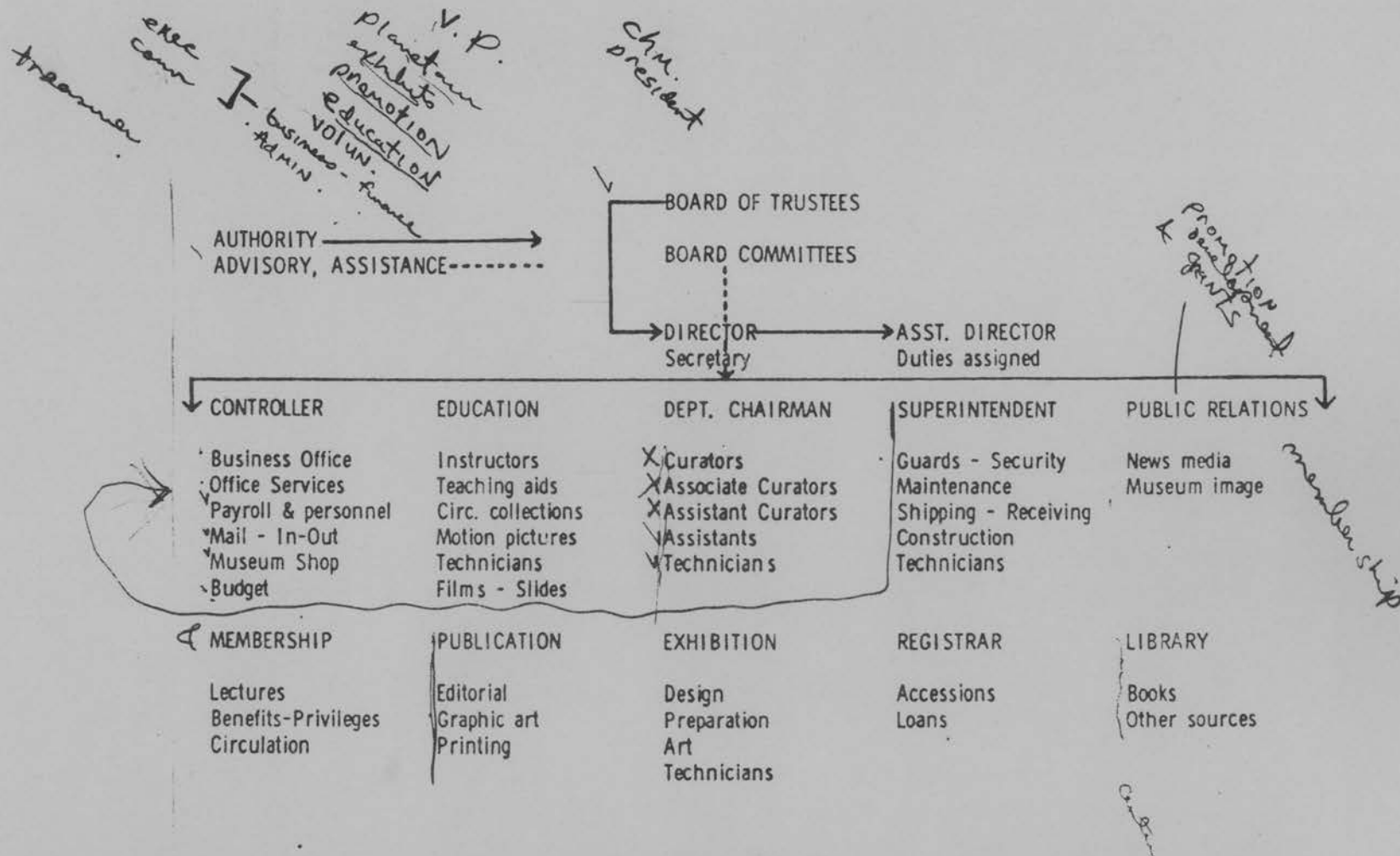
Director	\$15,000
Assistant Director	12,000
Astronomer	12,000
Planetarium Specialist	10,000
Electronics Technician (half time)	<u>5,000</u>
	\$54,000

Total \$330,800

personnel



(Organization of a Museum)



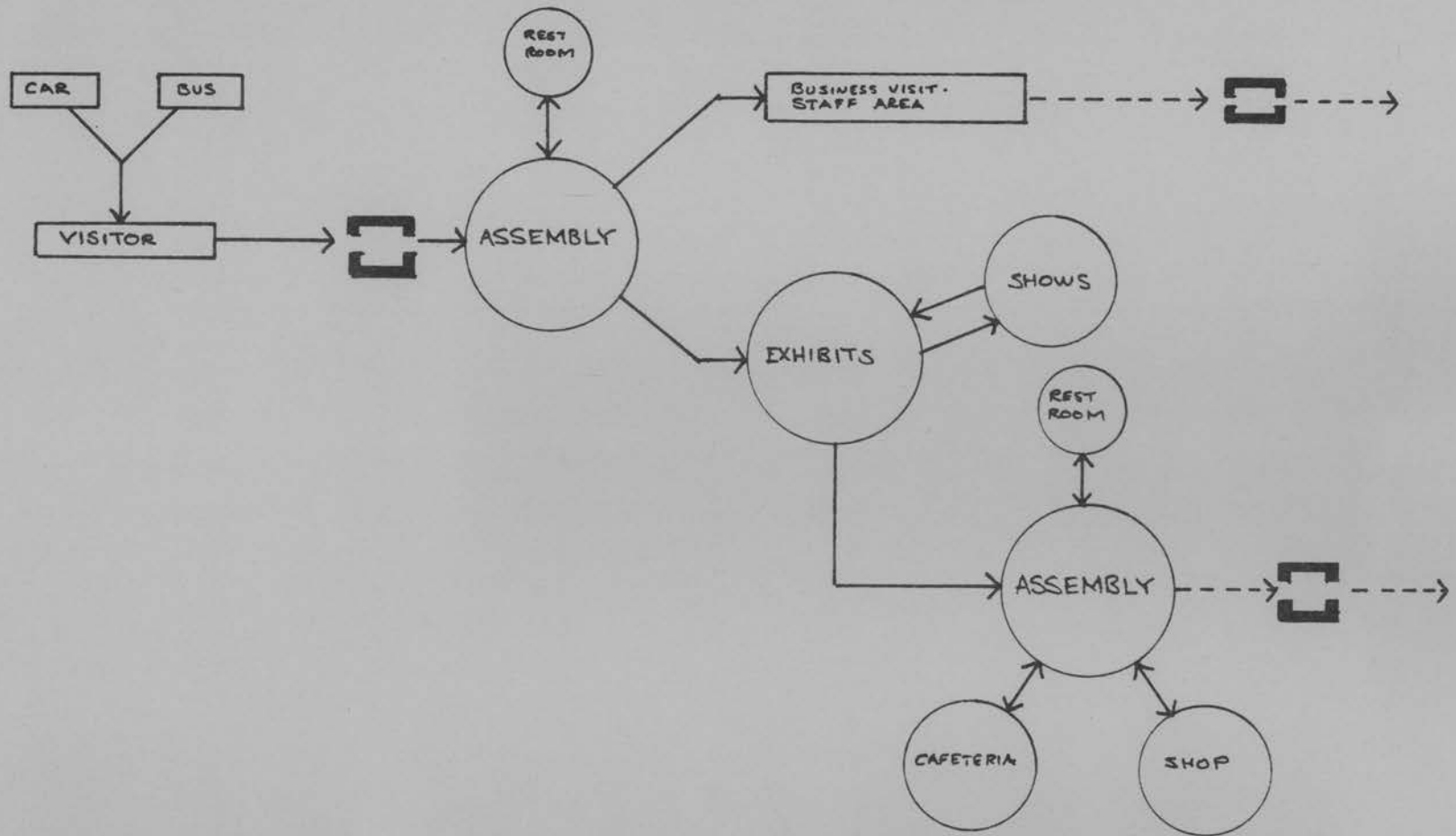
(Organization of a Museum)

client's own corrections

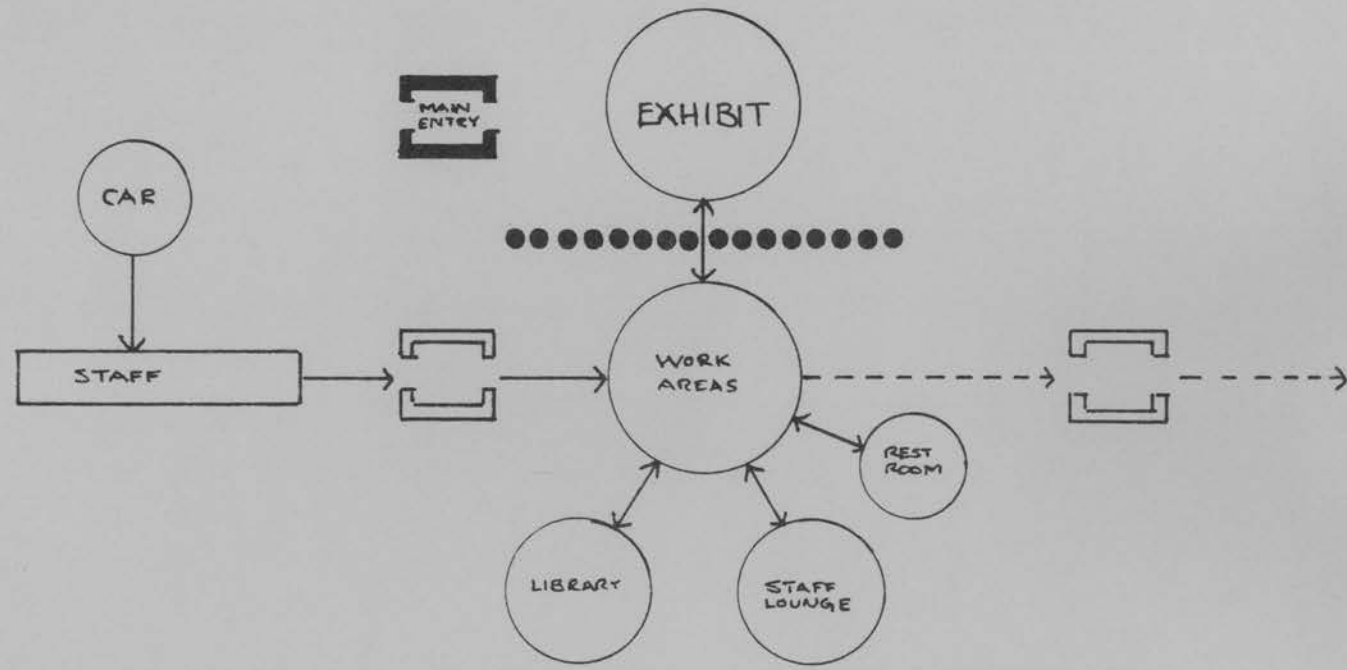
TITLE
NUMBER OF POSITIONS
PURPOSE OF JOB
JUSTIFY
DUTIES INVOLVED
IMMEDIATE SUPERIOR
TOOLS AND FURNISHINGS REQUIRED
INPUTS AND SOURCES (from whom and where does what come, e.g. data,
orders, supplies, materials)
OUTPUTS AND DESTINATIONS (what product or service is generated and
who gets it)

Visitors comprise two typical categories, individual or family visitors and organized group visitors. Individuals visit the facility and view and partake in the exhibits. They may stop for a snack or bring a picnic lunch. They may also purchase items at the center shop. Groups do the same things but require an assembly area and are involved in activities or lectures which are arranged with the staff in advance.

The movement of people and objects through the facility are a significant aspect of programming. The following three flow diagrams show the movement of visitors, staff and objects through the space center.

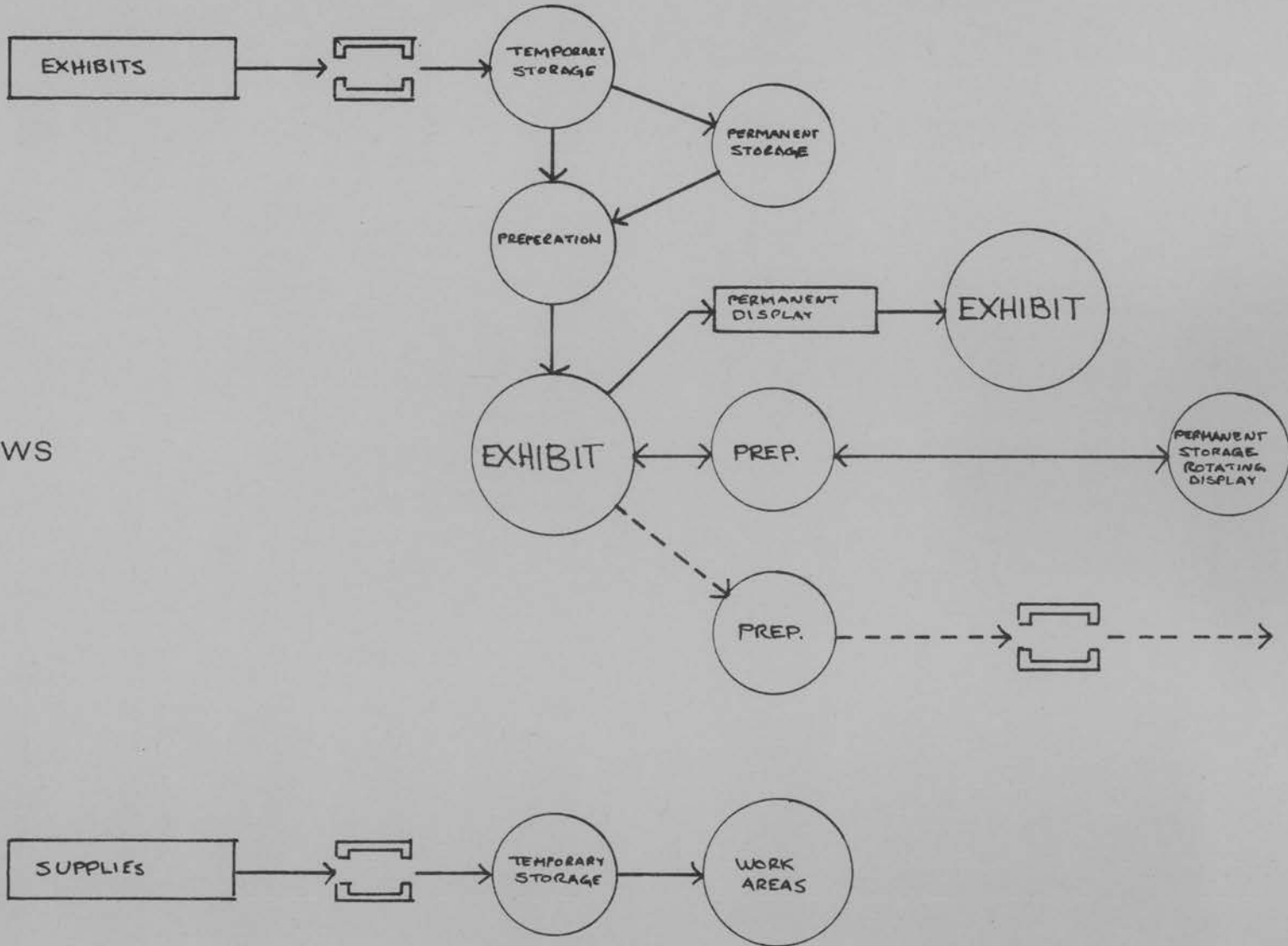


visitor flow



staff flow

object flows



The kinds of spaces needed are expressed in a space diagram. The major space concept is separation of staff and public areas. See next page.

The Alabama Space and Rocket Center provides many exhibit ideas. Jon L. Allen describes the following in his book Aviation and Space Museums of America.

- a central area containing full size space hardware such as Mercury and Apollo spacecraft
- a moon rock display
- a satellite tracking station receives and displays weather information directly from space
- space suits and astronaut equipment
- a Future In Space section with models of the shuttle, space stations, Mars lander
- educational exhibits: solar system model, a planetarium
- hands on exhibits
 - remote control rocket engines
 - a heart monitoring system which lets visitors check their own heart rates
 - a lunar module landing simulator
 - a gyro chair in a simulated spacecraft
 - an air chair which rides on a cushion of air
 - a zero gravity simulator



© 1978 Russ Meyers

needs and data

The Needs and Data section is for organizing the facts which bear on the design. These facts were culled from interviews with the client, his staff, and other sources. The section is in four parts. The first part views the facts in terms of users' and objects' needs. The second part organizes the data of the first in terms of space considerations. The third analyzes the relationships between spaces through the use of bubble diagrams. The fourth part presents the site parameters.

1) Organized Groups. Essentially these groups are classes from schools throughout the state. They range from K through 8. The teacher has made reservations for a demonstration or lab. The students are gathered into "classrooms" for these demos. Anywhere from five to ten groups visit the center per day. This occurs from Tuesday through Friday averaging 500 students per day or 2000 for the four days. Each group is comprised from 50 to 100 students but usually number about 50 with 2 to 4 adults: the teacher and chaperones. A major characteristic of these student groups is that the teacher has used the "field trip" as a reward for some performance criteria at school. Hence the visit to the center is perceived by the pupils as a time for fun and games. This leads to problems in group control, lost children and noise. These groups usually arrive in school buses. After the demonstrations these groups move through the center and view the general displays. The staff person operating a display tries to insure that each child gets a chance to participate. At most four groups are in the center at one time.

2) Individuals and Families. Observations of these users indicate they are in small groups of 2 to 6 persons usually being couples with or without children. They arrive by auto and move through the center independently. The highest traffic for individuals occurs Thursday through Sunday. Two thirds of this traffic occurs on the weekend. About 1000 individuals visit per week. During the summer months it rises to 1500.

Both user groups require restrooms, drinking fountains, snack services and resting areas. The organized groups also require an assembly area for such things

as "counting noses" and distributing literature and tickets. A drop off and parking space for school buses is needed. Visitors to the Space Center like to take a memento of their visit with them. The Center should provide a gift shop.

1) Executive Director. The Director provides leadership and vision for the Center. He is the final decision maker in the day to day operation of the Center. He initiates projects, determines policies and coordinates activities among the various departments. He reports to the Board of Trustees and represents the Center at public affairs. He signs the checks: payroll and otherwise. The Executive Director presides over a weekly staff meeting comprised of department heads to discuss and coordinate their activities.

The Executive Director requires an office equipped with desk, chair, credenza or lay table, book shelves, phone, 2 guest chairs. He should have a conference space with table, seating for ten, audiovisual equipment and coffee service, a coat rack or closet.

2) Secretary to the Director/Office Manager. The Secretary to the Director performs all secretarial duties for the Director: typing, filing, minutes of staff meetings and correspondence. In the role of Office Manager he maintains the membership roster, controls and distributes office supplies and acts as Personnel Director. The Secretary/Manager will soon be assigned a full-time assistant. In addition there are two high school students hired during the summer through a state jobs program.

The Secretary/Manager needs: A minimum of 8 four-drawer file cabinets, 3 supply cabinets, a desk, typewriter, phone, chair.

- Assistant: Desk, typewriter, chair, phone
- 2 Students: One eight foot work table, 2 chairs
- Waiting space for visitors to Director: Seating for four with coat rack.

3a) Assistant Director/Education Director. The Assistant Director substitutes for the Director when he is gone. However his major duties are as Education Director. He develops along with his staff the special demonstrations and classes offered to student groups. He also coordinates the exhibits in the main area to relate with the demonstrations. His education staff consists of the Reservationist, the part-time Teachers, and his full-time Assistant. His exhibit team consists of the Exhibit Designer, Carpenter, Electronic Specialist and volunteers.

The Assistant Director requires a desk, chair, lay table, book shelf, phone, 2 file cabinets, 2 chairs. The Education Assistant needs a desk, chair, typewriter, phone.

3b) Reservationist. The Reservationist is in charge of booking classes and school groups, reports to the Education Director, determines weekly schedule of events and maintains the inter-office mail drop.

The Reservationist requires a desk, chair, typewriter, phone, 2 file cabinets, pigeon hole mail drop (36 boxes), 3'x5' bulletin/calendar where all can see.

3c) Part-Time Teachers perform the demonstrations.

The part-time Teachers require 2 "classrooms" each with 16'x3' table surface area, seating for 75, 1 sink, a raised stage area, audiovisual equipment and storage, projectors and sound system and materials storage space.

3d) Exhibit Designer. The Exhibit Designer plans and directs construction of exhibits for the main areas. He works with the Education Director determining the type and level of complexity of each exhibit. Any items received for display are set up under his direction. He works with (and a lot of times against) the Art Director deciding the proper graphics and signage for the various exhibits. His staff is comprised of a carpenter, a technician, and two helpers.

The Exhibit Designer requires a drawing table, a stool, phone, a lay table, a flat file, some tack space 5'x5' minimum, and a shelf for reference books.

The carpenter requires three drill presses, a 4'x30' timber storage area, two band saws, two table saws, a minimum of four hundred square foot spray paint area and fifty lineal feet of work bench,

The electronics technician requires one 3'x3' work bench, a stool, one "in" file shelf, one "out" file shelf, a shelf over the workbench for test equipment: meters, scopes, etc., and parts storage bins under the bench.

The volunteer helpers requirements are listed under "volunteer coordinator."

Also required above is storage for brooms, brushes, pails, vacuums, scaffolds and ladders, slop sinks at various needed locations and exhibit storage space.

4) Planetarium Director. The Planetarium Director orchestrates the planetarium shows. He composes shows with lights, music, voice, and photographic techniques. His two assistants aid in all these areas and provide ushering and crowd control in the dome. He operates the observatory and holds night programs for small groups at the telescope.

The Planetarium Director needs a desk, a chair, a book shelf, an 'omnimay' space theater system, a small observatory capable of supporting a 24" telescope, a small canopy dome for classes about 20' in diameter and storage for a portable star projector.

The Assistants require a 3'x5' slide sorter/light table, storage for slides, a small photo lab including a sink, chemical storage, an enlarger, a cutter and paper storage, and a film dryer, a recording studio comprised of a soundproof enclosure for voice recordings capable of seating 2 people and an electronics room with 2 turntables, hardware rack, an equalizer board, record and tape storage and seating for two people. A record and tape long term storage space, a work area for maintenance and construction of projectors, special effects, lenses etc. One hundred lineal feet of shelf storage, 40 lineal feet of work-bench.

5a) Business Manager. The Business Manager oversees the day to day business operations of the Center. He reports to the Director and handles admission fees, shipping and receiving, gift shop sales and orders supplies and materials. He's also in charge of maintenance and security.

The Business Manager requires a desk, a chair, a phone, a credenza or lay table and two guest chairs.

5b) Two Full-Time Sales People operate the gift shop. They maintain the shop, keep inventory, sell materials and memberships. Sales average 300-400 items/day. Including post cards, books, trinkets, posters, t-shirts, etc.

The sales people require a desk, a work table, a phone, six display cases about 3'x6', a cash register, some bag storage, 2 sets 4' inventory storage shelves and a receiving area.

5c) Security. Two security people work the Center one at the front entry screens and directs visitors. The other walks through the building checking all exits and monitoring the visitors.

Security requires walkie talkies, a phone, and a security station with ticket box and shelves for checklists.

5d) Maintenance. Two maintenance persons wash floors, supply toilet rooms, clean offices, maintain the grounds and do spot repairs on mechanical devices.

The maintenance personnel require a desk and phone, shelf storage for supplies, vacuums, scrubbers, tools, a storage space for a 4 level scaffold shared with the exhibit department. At critical points throughout the facility should be janitors closets with slop sink and a shelf.

6a) Bookkeeper. The Bookkeeper provides a service to all other departments. He ideally works along with the Business Manager. He handles all requisitions, invoices, statements, the payroll and all bills. The Bookkeeper is responsible for all cash on hand distributing petty cash as needed. He maintains all records and reports of interest to insurance companies, the Internal Revenue and other agencies. Future plans call for computerization of many aspects of the Bookkeepers functions.

The Bookkeeper needs a secure area which can be locked since he handles cash. He needs a small safe, a desk, a chair, eight 4-drawer file cabinets, a calculator, two adding machines and a phone.

6b) Bookkeeping Assistant/Programmer. This person assists the Bookkeeper and operates all computing devices.

The Assistant/Programmer requires a desk, a chair, a phone, a blackboard, a work table, four file cabinets (4-drawer), and most importantly, a computer terminal or a micro computer.

7) Art Director. The Art Director and staff provide "Art" services for the entire Center. These include design, advice on art purchases and supplies. Their work is mainly museum and exhibit graphics, publications, handouts and the monthly news letter. The art work on exhibits are graphical explanations and informational diagrams. The art department's staff is comprised of the Director and 3 full time plus one part time artists. Art services also include coordination with the exhibit designer, painting signage, printing, photography, silkscreening and publications layout.

Equipment required by the art department staff includes eight drawing tables, which is two for each full time artist since work is done on several projects simultaneously, four lay tables, two large sinks for silkscreening, a desk with a phone, a large cutting surface, storage for work and paper, drying racks for silkscreens, a photo lab, a press type storage file, a camera processor such as

the "Visua Graphics Co. CPS316" which occupies a 4'x6' space, a photo file, lockers, and a small print shop with an A. B. Dick type mineo and a collator.

8a) Volunteer Coordinator. The Volunteer Coordinator recruits, trains and supervises volunteers for the Center. He also chairs fund raisers such as the Used Book Fair, the Science Fair and parties for the volunteer organization: "Omnipeople." The coordinator has one assistant.

The Volunteer Coordinator requires a desk, a chair, a typewriter, a work table and a scheduling board. The assistant needs a desk, a chair, a phone, typewriter and a work table.

8b) Volunteers. The volunteers are typical (perhaps better than typical?) citizens who offer their time and skills to the Center. They matriculate an orientation class and then receive on the job training working in the planetarium, the education program, assisting the lab demonstrations and operating some exhibits. Other volunteers come to the Center and work in groups to make items for the gift shop or help in mailing the newsletter. They are a motley group ranging from little old ladies quilting blankets to about forty teenagers who act as guides for special events. During the summer a special program has twelve teenagers working each day. Attendance at regular meetings is 15 to 20. Periodically a general meeting is held with about 100 "Omnipeople."

The volunteers set their own hours and therefore are arriving and leaving throughout the day. The volunteers are a precious asset and should be provided with some amenities for comfort.

The volunteers should have locker facilities for changing into uniform, a lounge area seating 30 people, a workroom with tables and seating for 20 which can double as a meeting room, a storage cabinet for glassware and equipment used for teas and parties, a small lending library for background information when operating a lab or exhibit. A general information bulletin board and a place for large functions of about one hundred people and a public phone. The volunteers should have easy access to the coordinator.

9) Exhibit spaces recommended by the staff at the Alabama Space and Rocket Center.

9a) General Space. A general exhibit space is required to display acquisitions such as capsules, aircraft, satellite and mock ups.

The general space should be about twelve thousand square feet in area with an industrial rated floor, special access for moving in exhibits, an open plan, a grid system of electrical outlets in the floor and portable lighting systems.

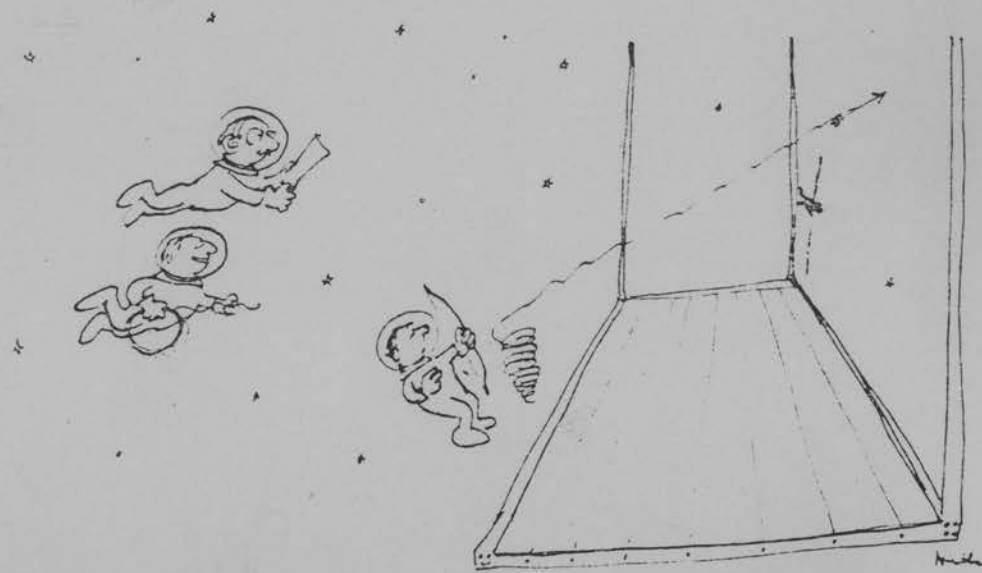
9b) Controlled Space. This area is used for displays and models which simulate space environments and activities such as a solar system model, space stations and walks on the moon.

The controlled space should be about six thousand square feet in area, have easy access for equipment and construction, should be windowless or light tight and have a system of partitions for maximum background control.

10) The permanent exhibits are a "Zero Gravity Simulator" and a "Lunar Odyssey." Again, these items were recommended by the staff at the Alabama Space and Rocket Center.

The Zero Gravity Simulator requires sufficient clearance for the counter balances electrical power to work the weights control and sufficient footings for anchorage.

The Lunar Odyssey is a small planetarium which simulates a trip to the moon. The entire planetarium spins, simulating 2G acceleration through centrifugal force. It requires electrical power and an industrial rated floor slab.



"Yeah, boss, our cable stringing is way ahead of schedule since Pete brought his kid's bow and arrow up on the Shuttle."
Drawn especially for NSI by David Hills, Winston-Salem, North Carolina, © 1976

space

SNACK BAR

quantity

1

area

720 SQ. FT.

requirements

FIXED SEATING FOR 50, TRASH RECEPTORS, SALAD BAR, SERVING COUNTER

space

FOOD PREPARATION

quantity

1

area

500 SQ. FT.

requirements

PLUMBING, VENTILATED, ACCESS TO SHIPPING AND RECEIVING, DUMPSTER,
COLD STORAGE

space

FOOD STAFF LOCKER ROOM

quantity

2

area

150 SQ. FT

requirements

STORAGE FOR CLOTHING, LAVATORIES AND TOILETS, A BENCH

space

ASSEMBLY AREA

quantity

4

area

625 SQ. FT.

requirements

A DESIGNATED AREA NEAR THE ENTRANCE, SEATING FOR 25 PEOPLE

space	DIRECTOR'S OFFICE
quantity	1
area	150 SQ. FT.
requirements	DESK, CHAIR, CREDENZA, BOOK SHELF, 2 GUEST CHAIRS, PHONE

space	CONFERENCE SPACE
quantity	1
area	150 SQ. FT.
requirements	TABLE, SEATING FOR 10, AUDIOVISUAL CABINET, COAT RACK

space

SECRETARY TO DIRECTOR

quantity

1

area

200 SQ. FT.

requirements

DESK, TYPEWRITER, 8 FOUR DRAWER FILE CABINETS, 3 SUPPLY CABINETS,
PHONE, COAT RACK, SEATING FOR FOUR

space

ASSISTANT'S WORK AREA

quantity

1

area

150 SQ. FT.

requirements

DESK, CHAIR, TYPEWRITER, PHONE, WORK TABLE, 2 SIDE CHAIRS

space	ASSISTANT DIRECTOR'S OFFICE
quantity	1
area	150 SQ. FT.
requirements	DESK, CHAIR, LAY TABLE, BOOKSHELF, PHONE, 2 FILE CABINETS, 2 CHAIRS

space	EDUCATION ASSISTANT
quantity	1
area	100 SQ. FT.
requirements	DESK, CHAIR, TYPEWRITER, PHONE

space

RESERVATIONIST

quantity

1

area

150 SQ. FT.

requirements

DESK, CHAIR, TYPEWRITER, PHONE, 2 FILE CABINETS, MAIL DROP - 36 BOXES,
BULLETIN

space

CLASSROOM

quantity

2

area

1200 SQ. FT.

requirements

2 8 FOOT TABLES, 75 CHAIRS FOR AUDIENCE, AUDIOVISUAL EQUIPMENT

space

EQUIPMENT STORAGE

quantity

1

area

150 SQ. FT.

requirements

SHELVES, 2 LOCKING CABINETS, ROOM MUST BE LOCABLE, HAVE ACCESS
TO BOTH CLASSROOMS

space	EXHIBIT DESIGNER'S STUDIO
quantity	1
area	200 SQ. FT.
requirements	DRAWING TABLE, STOOL, PHONE, LAY TABLE, FLAT FILE, TACK SPACE, REFERENCE SHELF

space

WORKSHOP

quantity

1

area

1000 SQ. FT.

requirements

3 DRILL PRESSES 2'x3' USER SPACE

4'x30' TIMBER STORAGE RACK

2 BAND SAWS 2'x3' USER SPACE

2 TABLE SAWS 4'x8'

VENTILATION, ACCESS TO SHIPPING AND RECEIVING, ELECTRICAL,

25 FOOT MINIMUM CLEARANCE, PLUMBED

space

SPRAY AREA

quantity

1

area

400 SQ. FT.

requirements

VENTILATION, PLUMBED AND DRAINED, SAME AS WORKSHOP

space	ELECTRONICS SHOP
quantity	1
area	150 SQ. FT.
requirements	WORK BENCH, IN-OUT SHELVES, PARTS STORAGE, TEST EQUIPMENT SHELVES

space

EXHIBIT STORAGE

quantity

1

area

1000 SQ. FT.

requirements

MINIMUM 30' CLEARANCE, ACCESS TO SHIPPING AND RECEIVING AND MAIN
EXHIBIT SPACES

space

EXHIBIT MAINTENANCE

quantity

1

area

150 SQ. FT.

requirements

STORE ROOM FOR BROOMS, BUCKETS, BRUSHES, SUPPLIES, SCAFFOLDING, SLOPSINK

space	PLANETARIUM DIRECTOR'S OFFICE
quantity	1
area	150 SQ. FT.
requirements	DESK, CHAIR, BOOKSHELF, PHONE, WORK TABLE

space

SPACE THEATER

quantity

1

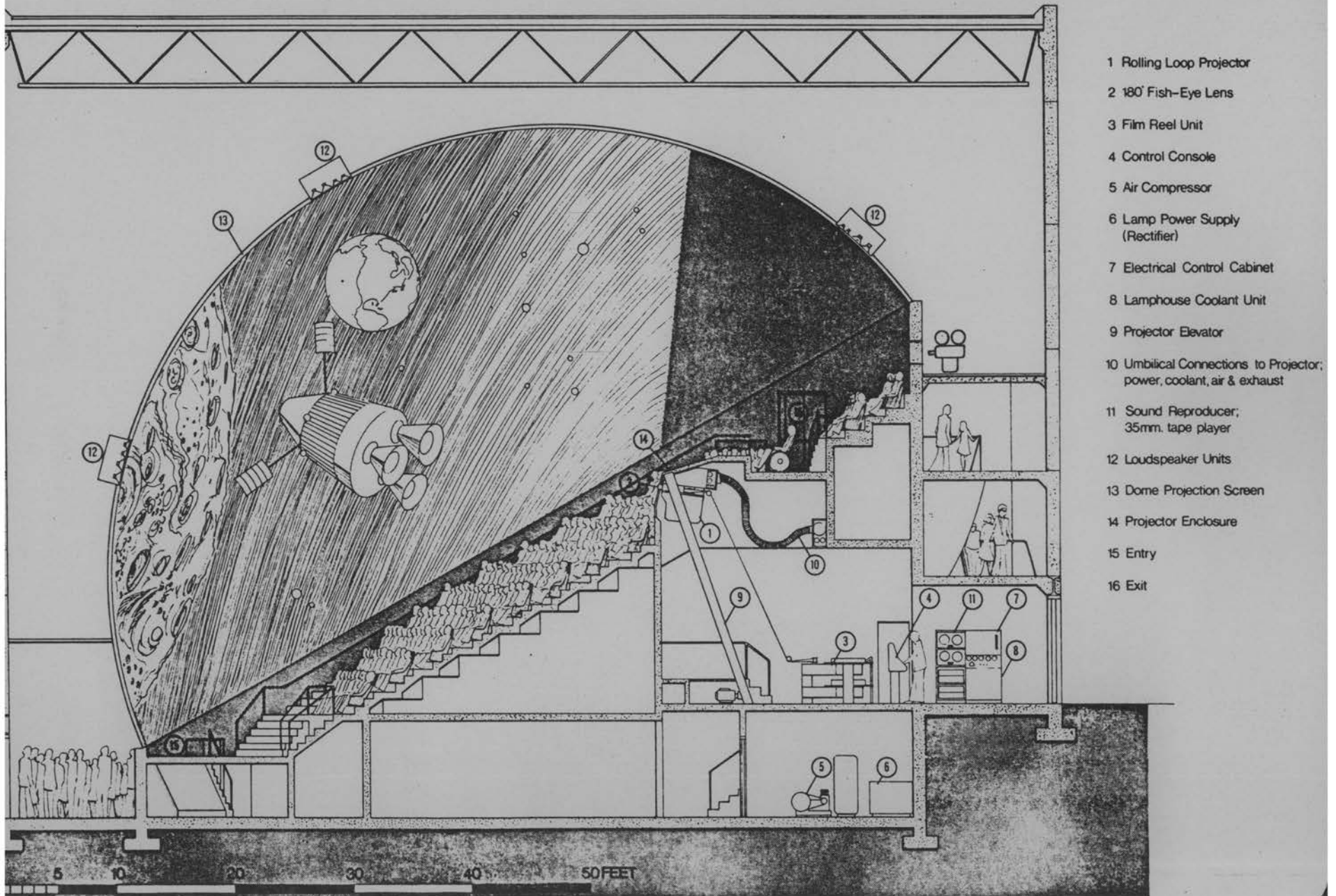
area

8100 SQ. FT.

requirements

SEE DIAGRAM NEXT PAGE, OMNIMAX PROJECTION SYSTEM, SEATING FOR 300,
VENTILATION

OMNIMAX THEATRE 46



- 1 Rolling Loop Projector
- 2 180° Fish-Eye Lens
- 3 Film Reel Unit
- 4 Control Console
- 5 Air Compressor
- 6 Lamp Power Supply (Rectifier)
- 7 Electrical Control Cabinet
- 8 Lamphouse Coolant Unit
- 9 Projector Elevator
- 10 Umbilical Connections to Projector; power, coolant, air & exhaust
- 11 Sound Reproducer; 35mm. tape player
- 12 Loudspeaker Units
- 13 Dome Projection Screen
- 14 Projector Enclosure
- 15 Entry
- 16 Exit

space	SLIDE ROOM
quantity	1
area	100 SQ. FT.
requirements	3'x5' SLIDE SORTER, CHAIR, SLIDE FILES

space

DARK ROOM

quantity

1

area

100 SQ. FT.

requirements

TYPICAL LAB WITH WET AND DRY SIDES, ENLARGER, PAPER STORAGE, LIGHTS,
ROOM MUST BE LIGHT TIGHT, CONTROLLED ENTRY, SINK, CHEMICAL STORAGE,
VENTILATION

space	SOUND STUDIO
quantity	1
area	100 SQ. FT.
requirements	SOUNDPROOF, SEATING FOR 2

space	ENGINEER'S BOOTH
quantity	1
area	100 SQ. FT.
requirements	WINDOW TO SOUND STUDIO, 2 TURNTABLES, RACK FOR HI FI GEAR, EQUALIZER BOARD, SEATING FOR 2

space	STORAGE ROOM
quantity	1
area	100 SQ. FT.
requirements	RECORD RACKS, TAPE RACKS

space

WORK AREA

quantity

1

area

500 SQ. FT.

requirements

100 LINEAL FEET OF 2 1/2' SHELF SPACE 40' WORK COUNTERS WITH
STORAGE BENEATH

space	BUSINESS MANAGER'S OFFICE
quantity	1
area	150 SQ. FT.
requirements	DESK, CHAIR, PHONE, LAY TABLE, 2 GUEST CHAIRS

space

GIFT SHOP

quantity

1

area

400 SQ. FT.

requirements

DESK, CHAIR, WORK TABLE, PHONE, SIX 3'x6' DISPLAY CASES, CASH REGISTER/CHECKOUT
3'x6', BAG STORAGE, SMALL STOCK AREA FOR OPENING PACKAGES

space

SECURITY STATION

quantity

1

area

150 SQ. FT.

requirements

COUNTER OVERLOOKING ENTRY, PHONE, SHELVES, TICKET STORAGE,
TABLE, 4 CHAIRS

space

MAINTENANCE

quantity

1

area

300 SQ. FT.

requirements

DESK, PHONE, 2 CHAIRS, TOOL AND SUPPLY SHELVES, PROVIDE JANITORS CLOSETS
3'x5' AS NEEDED

space

BOOKKEEPER'S OFFICE

quantity

1

area

150 SQ. FT.

requirements

DESK, TABLE, CHAIR, 8 FOUR DRAWER FILE CABINETS, CALCULATOR, ADDING MACHINES, PHONE, SMALL SAFE - MUST BE SECURE AND LOCKABLE

space

COMPUTING ROOM

quantity

1

area

150 SQ. FT.

requirements

TERMINAL OR MICRO-COMPUTER, ELECTRICAL, 4 FILE CABINETS, WORK TABLE, PHONE,
2 CHAIRS, CHALKBOARD

space

ART STUDIO

quantity

1

area

1000 SQ. FT.

requirements

8 FIVE FOOT DRAWING TABLES, 4 SIX FOOT LAY TABLES, 2 LARGE SINKS 2'x3' BASINS

space

PHOTO LAB

quantity

1

area

200 SQ. FT.

requirements

DARKROOM 100 SQ. FT. (SEE PLANETARIUM DARKROOM) WORKROOM WITH CAMERA PROCESSOR,
5 LOCKERS, TABLE

space

PRINT SHOP

quantity

1

area

150 SQ. FT.

requirements

A. B. DICK PRINTER, COLLATOR, SHELVES FOR JOBS

space

DRYING AREA

quantity

1

area

150 SQ. FT.

requirements

DUST FREE, VENTILATED, SILKSCREEN DRYING RACK

space

VOLUNTEER COORDINATOR'S OFFICE

quantity

1

area

150 SQ. FT.

requirements

DESK, CHAIR, PHONE, TYPEWRITER, WORK TABLE, SCHEDULING BOARD

space	ASSISTANT'S OFFICE
quantity	1
area	150 SQ. FT.
requirements	DESK, CHAIR, PHONE, TYPEWRITER, 4 FILE CABINETS

space	VOLUNTEER'S LOCKER ROOM
quantity	2
area	150 SQ. FT.
requirements	20 LOCKERS, BENCH

space	VOLUNTEER'S LOUNGE
quantity	1
area	300 SQ. FT.
requirements	SEATING FOR 30, TABLES, COFFEE SERVICE, TACK SPACE

space

VOLUNTEER WORKROOM

quantity

1

area

350 SQ. FT.

requirements

SEATING FOR 20, LARGE WORK TABLES 3'x8', STORAGE

space	SPECIAL FUNCTION ROOM
quantity	1
area	1600 SQ. FT.
requirements	SEATING FOR 100, CHAIR STORAGE, PODIUM, AUDIOVISUALS

space

LIBRARY

quantity

1

area

150 SQ. FT.

requirements

DESK, CHAIR, TABLE, 4 CHAIRS, BOOK SHELVES

space

GENERAL SPACE

quantity

1

area

12,000 SQ. FT.

requirements

INDUSTRIAL RATED FLOOR, 30'x30' ACCESS DOOR, ELECTRICAL FLOOR GRID,
PROVISIONS FOR LIGHTING

space

CONTROLLED SPACE

quantity

1

area

6,000 SQ. FT.

requirements

LIGHT TIGHT, PARTITION SYSTEM, EASE OF ACCESS

space

ZERO-G

quantity

1

area

2400 SQ. FT.

requirements

FIVE DOUBLE TEETER UNITS 70'x30' MINIMUM
30'x10' LOADING ZONE, 45' MINIMUM CLEARANCE

space	LUNAR ODDYSEY
quantity	1
area	950 SQ. FT.
requirements	30' DIAMETER 25' MINIMUM CLEARANCE 200 SQ. FT. LOADING ZONE, LIGHT TIGHT

space PUBLIC RESTROOM

quantity 2

area 500 SQ. FT.

requirements

space

OFFICE RESTROOM

quantity

2

area

250 SQ. FT.

requirements

space	MECHANICAL
quantity	1
area	1000 SQ. FT.
requirements	SYSTEM TO BE DETERMINED

space

ELECTRICAL

quantity

1

area

200 SQ. FT.

requirements

space

SHIPPING AND RECEIVING (INDOOR)

quantity

1

area

600 SQ. FT.

requirements

MINIMUM 25' CLEARANCE

space

SHIPPING AND RECEIVING (OUTDOOR)

quantity

1

area

3900 SQ. FT.

requirements

APRON FOR TWO TRUCKS 55'x24' BAY 50' TURNING RADIUS AREA

space	PARKING, STAFF
quantity	1
area	13,000 SQ. FT.
requirements	45 SPACES

space

PARKING, BUS

quantity

1

area

9500 SQ. FT.

requirements

5 BUSES AT 1900 SQ. FT. FREE ACCESS SYSTEM

space

TOTAL NET AREA

quantity

area

50,070 SQ. FT.

requirements

space

TOTAL GROSS AREA

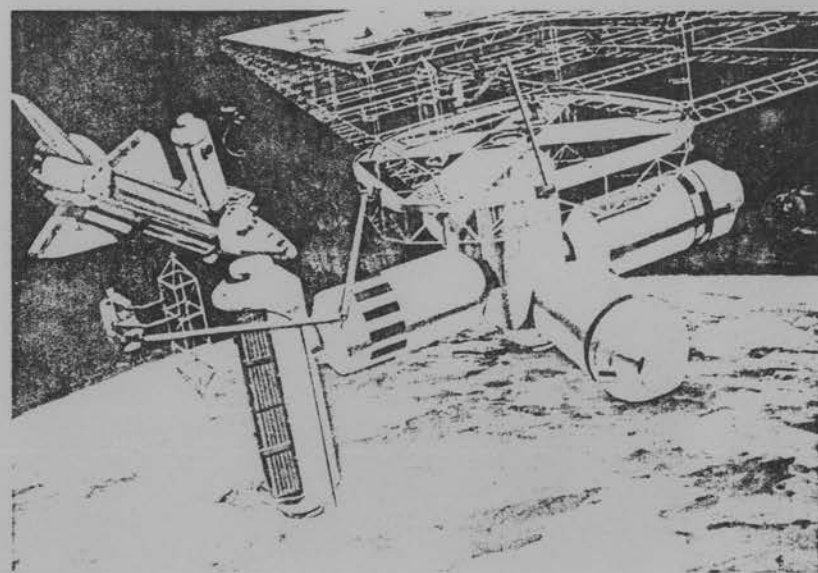
quantity

area

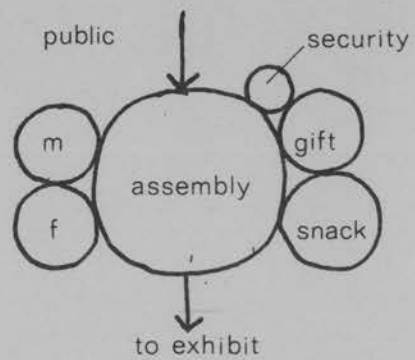
60,084 SQ. FT.

requirements

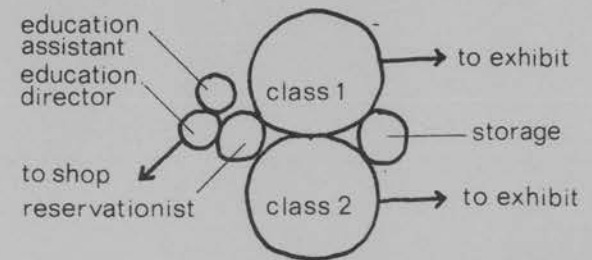
ALLOWING 20% CIRCULATION AND MATERIALS



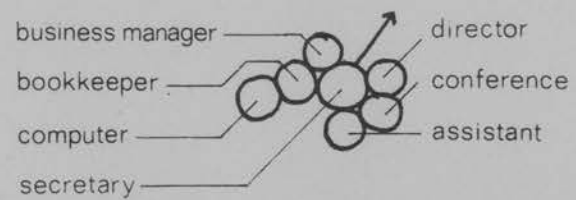
bubble diagrams



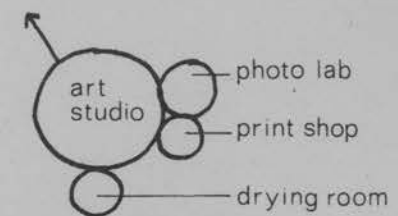
ASSEMBLY



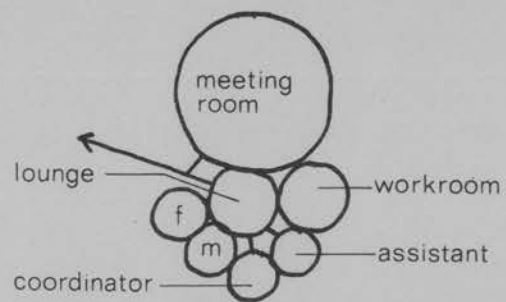
EDUCATION



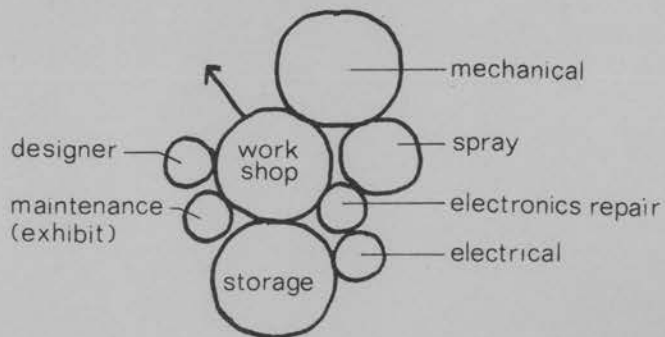
ADMINISTRATION



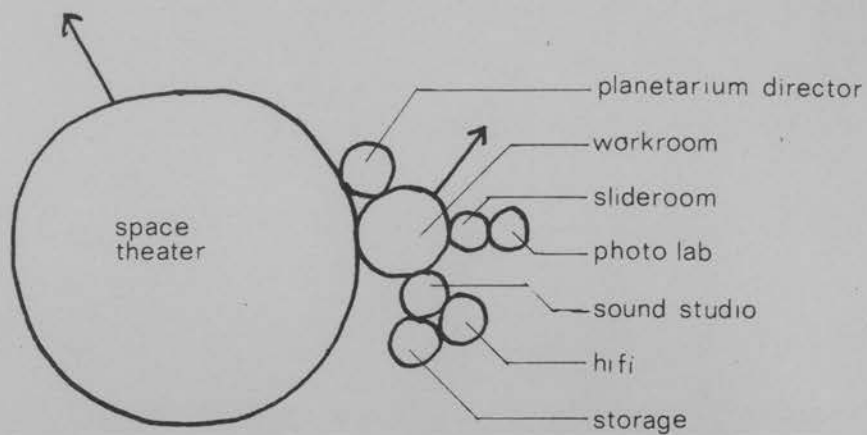
ART



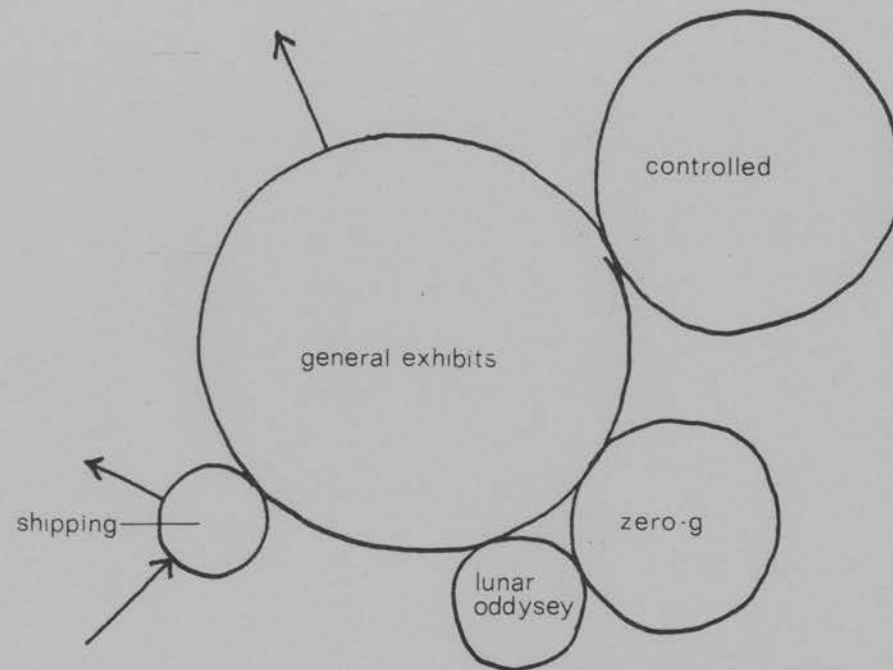
VOLUNTEERS



WORKSHOP



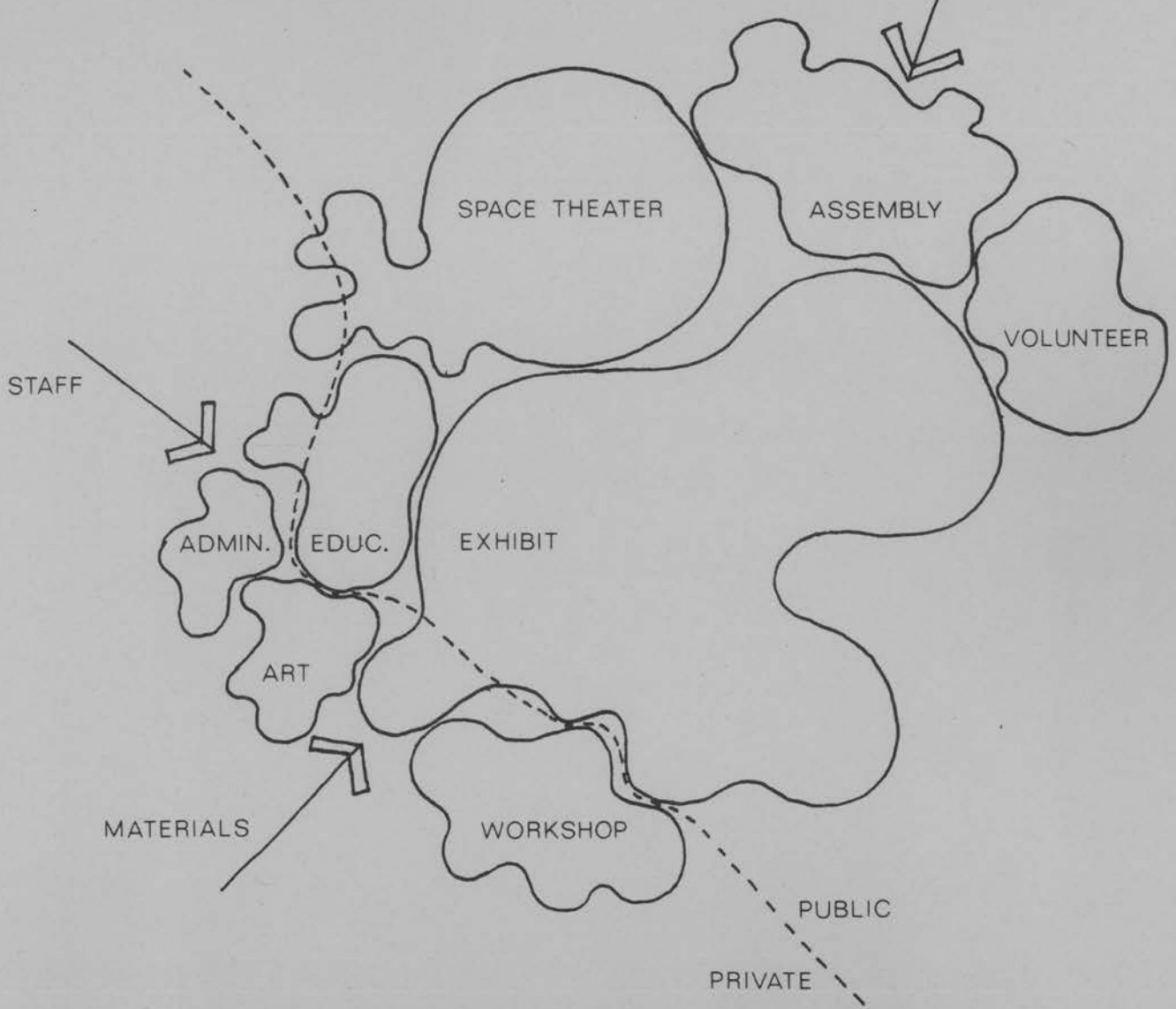
SPACE THEATER



EXHIBIT

87

VISITORS





Rick Meyerowitz

site

The site is located at 50th Street and Eastern Avenue in Oklahoma City. The following information about the site is graphically presented in the appendix.

Ownership: Public

Land Use: Currently a public part

Zoning: Currently zoned "R-1 Type A" OKC Zoning Office requires a rezoning to "R-1 Type D" Section 25-92(d) of code allows "institution of religious, education, or philanthropic nature." A visit to the OKC zoning office revealed that rezoning is "no problem" due to precedent of Omniplex to the north and the zoo to the east.

Surrounding Environmental Quality:

Unsightly development along Eastern Avenue to the west. Eastward is a semi-natural or wild condition with vegetation and rolling hills: the zoo.

Utilities: Water, electric, gas and hydrants along 50th and Eastern.

Traffic Circulation:

Primary source: Eastern Avenue, secondary source: Grand Blvd.

Soil Survey: Soil type is Noble Fine Sand Loam IVE-5. Excellent for institutional service.

Future Planned Uses:

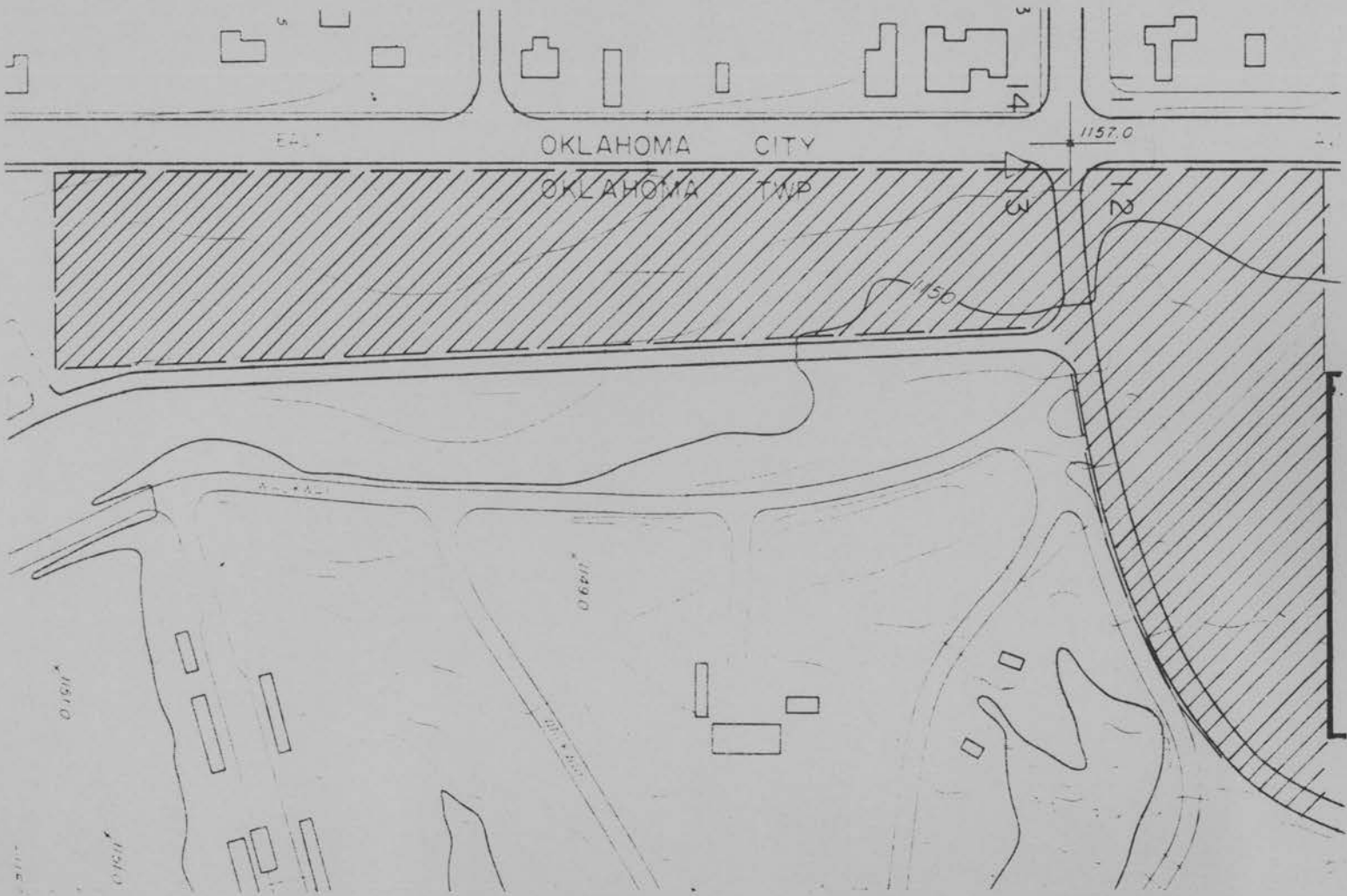
Paragraph e page 50 northeast development study: rezone to "R-1 Type D" for cultural, educational and recreational use. The proposed Space Center is compatible with this plan.

Proposed Public Construction Directly Affecting the Site:

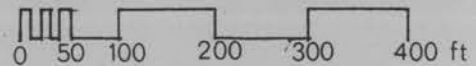
From Northeast Development Study: "An automated transportation system should be developed to loop around the expansion area of the zoo and connect all major public facilities in the area."

"50th should be upgraded to Boulevard standards from I-35 to Grand Boulevard." From Client: City has informed by client that 50th from Eastern to Grand Boulevard shall be closed to through traffic.

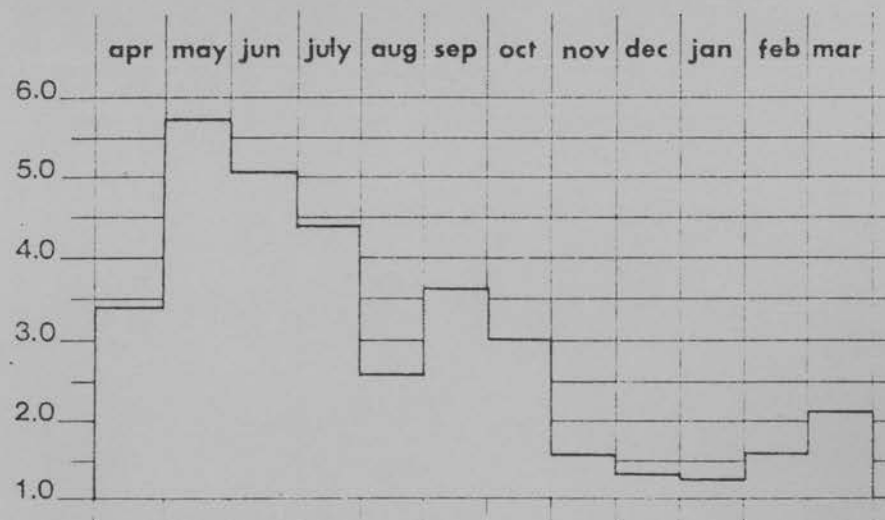
A site plan and climatological data follow immediately.



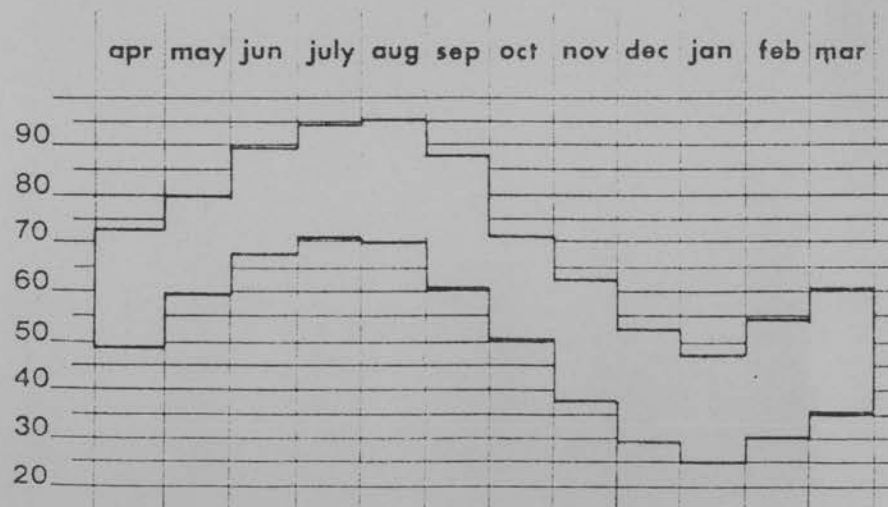
SITE



monthly precipitation (inches)



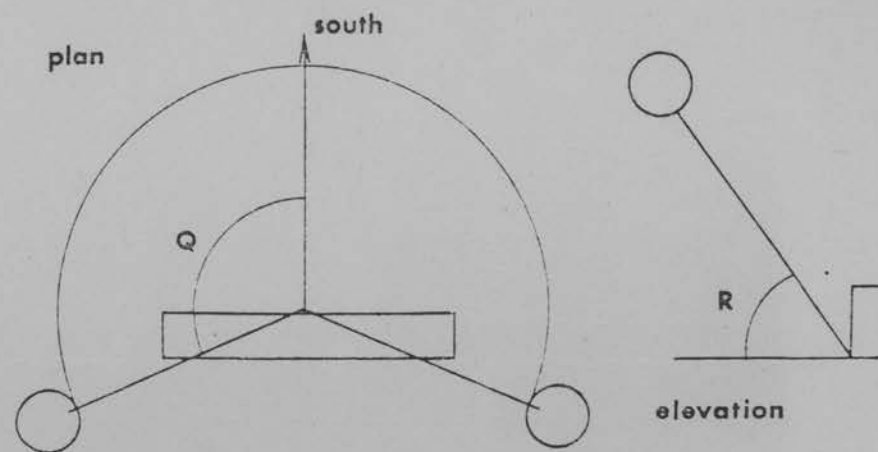
monthly temperature (°f)

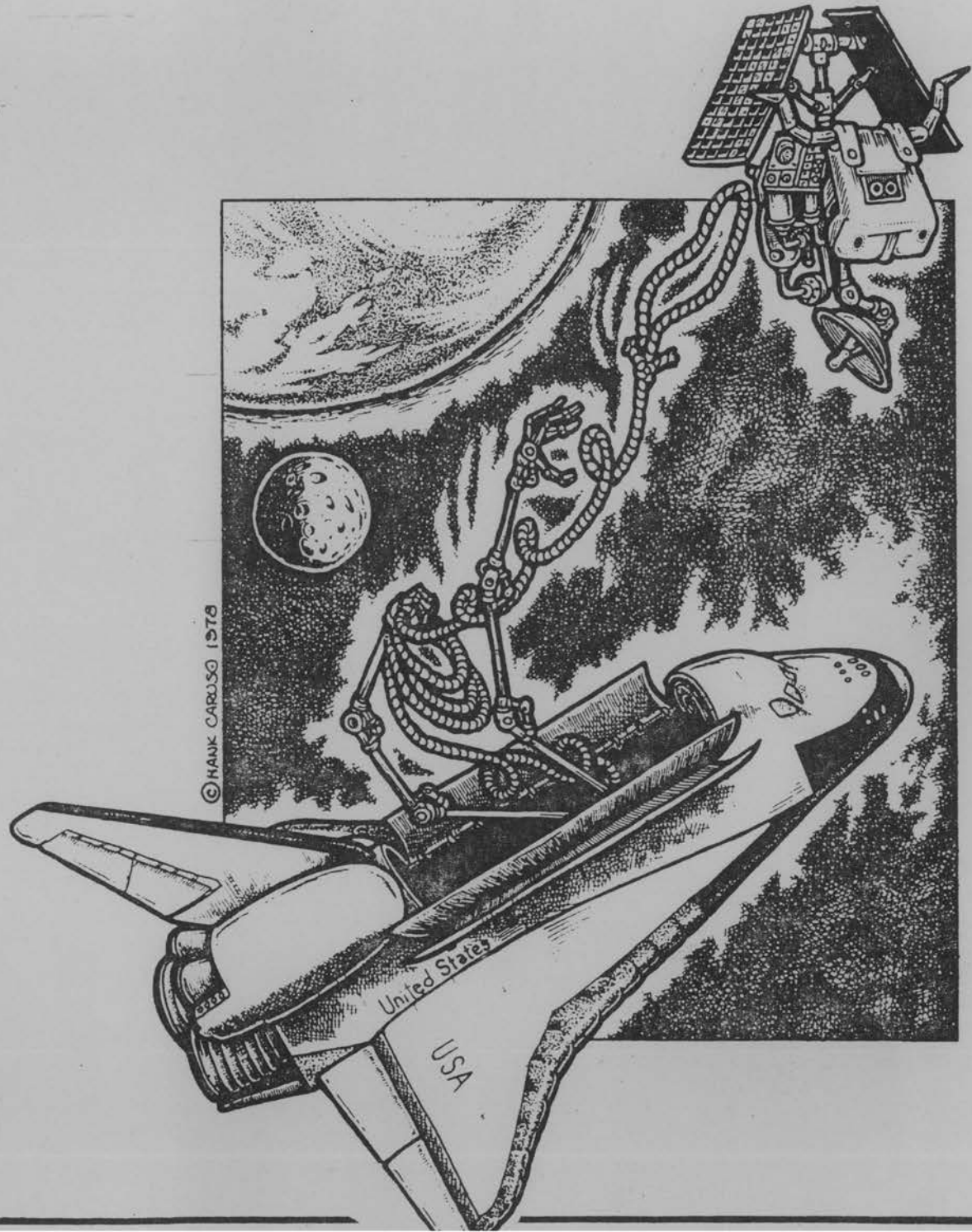


sun position (degrees)

21 st	jan	feb	mar	apr	may	jun	july	aug	sep	oct	nov	dec
sun- rise Q	64.5	76	90	104	115	119	115	104	90	76	64.5	60
sun- set Q	-	-	-	-	-	-	-	-	-	-	-	-
alti- tude R	33	42	48	61	74	80	74	61	48	42	33	30

relative to south wall





○ goals

□ concepts

This section is arranged in a two column system. The left column indicates desired goals. A few of these are "Motherhood" goals to stimulate design concepts.

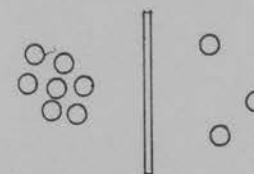
The others are programmatic goals which have corresponding concepts in the right column. The concepts suggest methods of achieving their respective goals.

*function

- The goal of the project is to raise the public's consciousness of the immediacy of space activities and to stimulate the pursuit of space related careers.

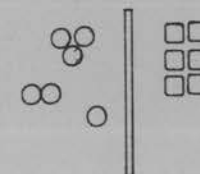
- The facility should allow for organized activities for groups which do not interfere with others' individual activities.

- Separate group activities from the general visitor activities.



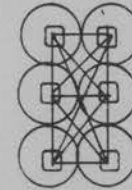
- The facility should provide for administrative privacy.

- Separate administrative from public areas.



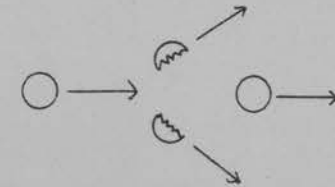
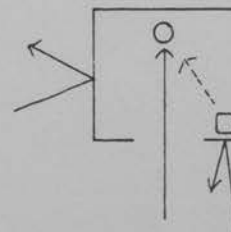
- The facility should be a fun place to visit.
- The facility should sustain employee interaction, a goal of the matrix style organization.

Integrate Administrative Areas



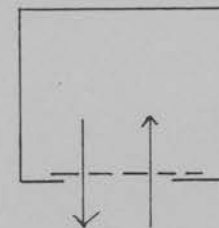
- The facility should invite "hands on" participation of the visitors.
- The facility should be secure against theft and vandalism without infringing the "hands on" function of visitors

Provide limited access and barriers and observation provide disposable exhibits.



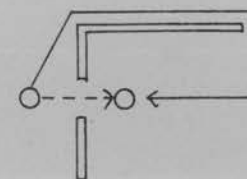
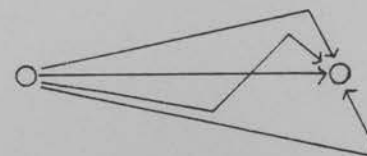
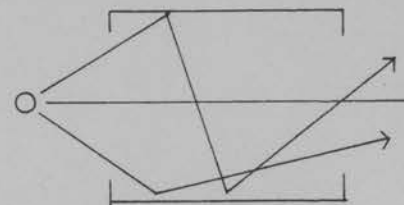
- The facility should protect all cash on hand.

- The Bookkeeper's Area and the Gift Shop are limited access zones and closeable



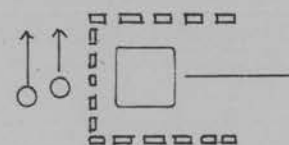
- The facility should provide for a multiple of experimental sequences according to visitor tastes.

- Exhibit areas have open plans, multiple routes, short cuts.



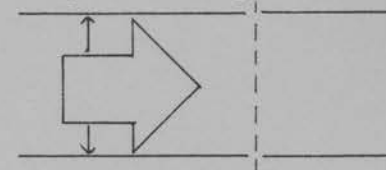
- The facility should ease the flows of visitors and incoming or outgoing exhibits, materials and supplies.

- Separate the flows with temporary enclosures and separate entries.



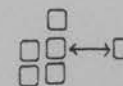
- The facility should permit easy change of exhibits.

- Provide "elbow" room, easy access, adjacency to storage and work areas.



- The facility should minimize staff travel and waiting time due to distance and bottlenecks.

- Provide direct communication and travel provide adjacencies where required.



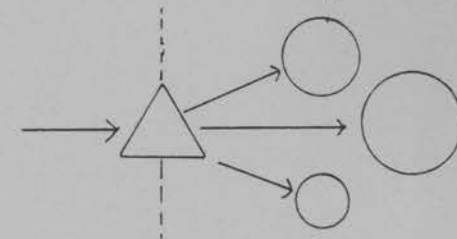
- The facility shall meet transportation requirements:

*form

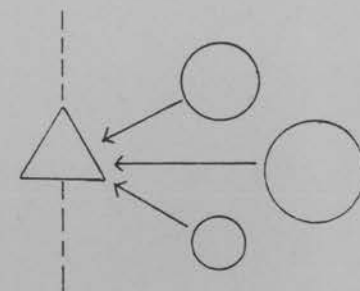
- The Center should be a "part" of the cultural complex area.
- The facility should not overpower the residential area across Eastern Avenue.
- The facility should indicate the Western edge of the cultural complex without being a barrier.

- Shared parking with omniplex separate staff parking potential station for people mover when and if it is built. Separate pedestrian for vehicle traffic

- The facility shall be a transition node to the cultural complex.



- The facility is a terminus of the cultural complex.

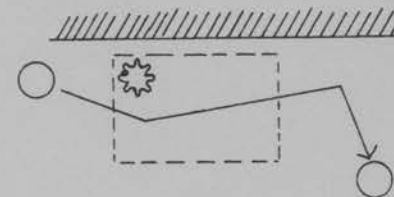


- The facility should be striking without intimidating or alienating the visitor.
- The facility should provide for the personal and "perceptive" safety of the visitor.
- The facility should aid visitor orientation.

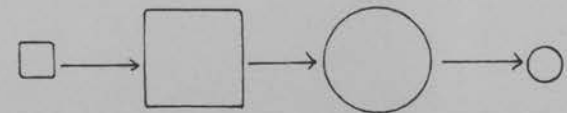
*economy

- The facility should sustain with minimum expense a variety of exhibits, gizmos and displays.

- The facility is provided with imageability indicating nodes, edges, zones, landmarks and paths.



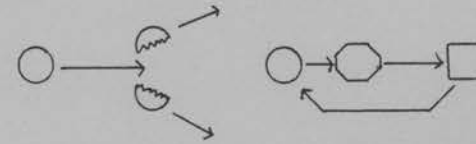
- Exhibit areas provided with variable volumes, light and power natural and artificial.



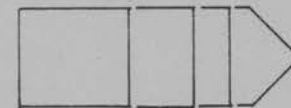
*time

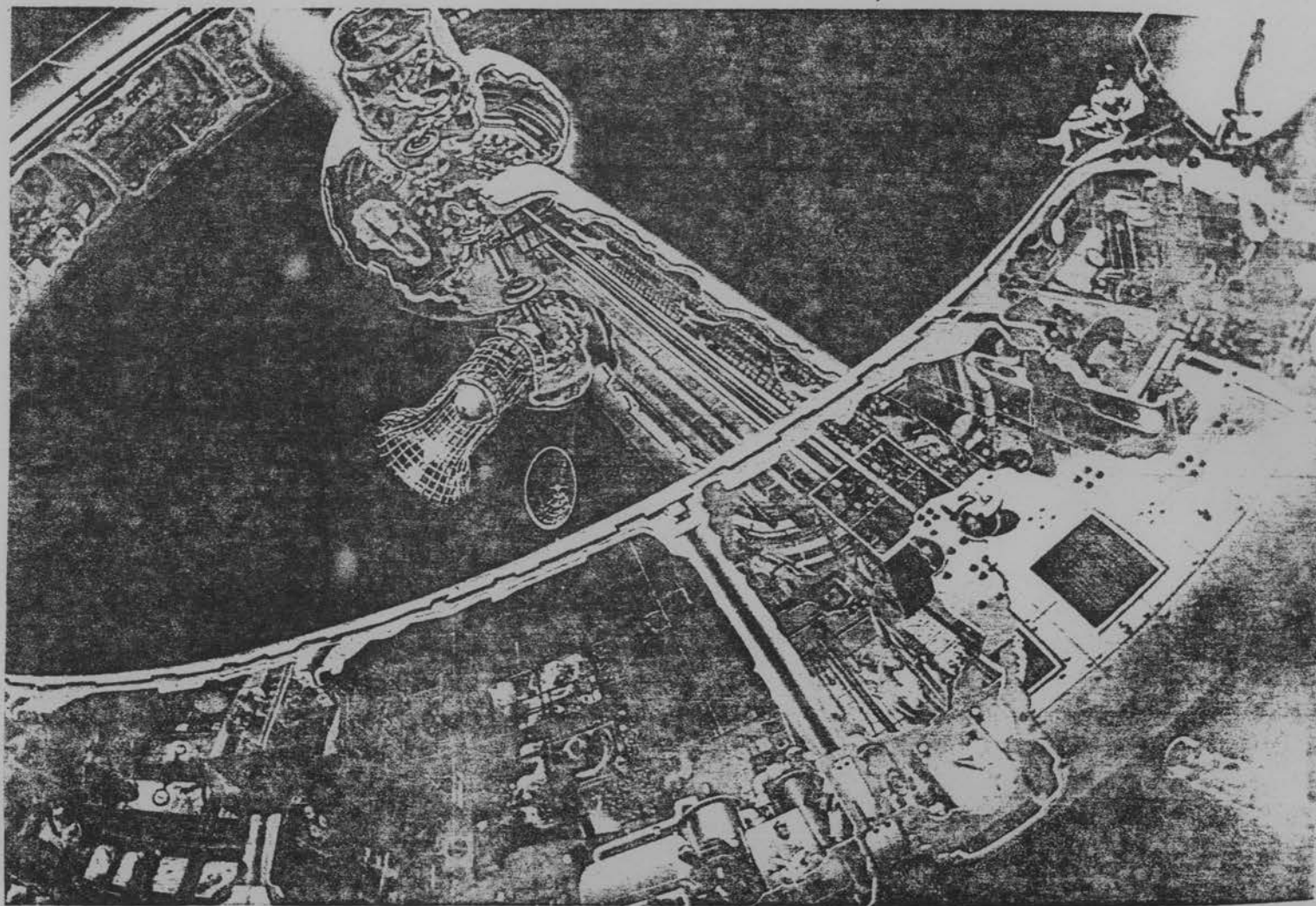
- The exhibit space should keep pace with the technological changes and resulting social changes occurring within and because of space activities.

- Provide disposable and recyclable exhibits and displays.



- Provide for expansion and modification.





Above: Veteran *Collier's* illustrator Fred Freeman produced this exciting cut-away of von Braun's space station. The 250-foot diameter space station was designed for a crew of 80 in orbit 250 miles above the Earth. (Illustration appeared March 22, 1952.)

problem statement The final step of programming is to state the problem. The problem statements express the essence, the obvious, and the uniqueness of the project. It is the first step in design.

Since visitors to the Space Center are anticipated to be visiting the omniplex as well, the Center should provide an activity connection to the omniplex.

Since the Space Center will be used by groups and individuals simultaneously it should service both without conflict.

Since both buses and cars will be used by the visitors the Center should accommodate them without conflict and disruption of offsite traffic flow.

Since some exhibits will be actual spacecraft the Center should accommodate delivery and set-up of heavy and large pieces without disrupting visitor use and offsite traffic flows.

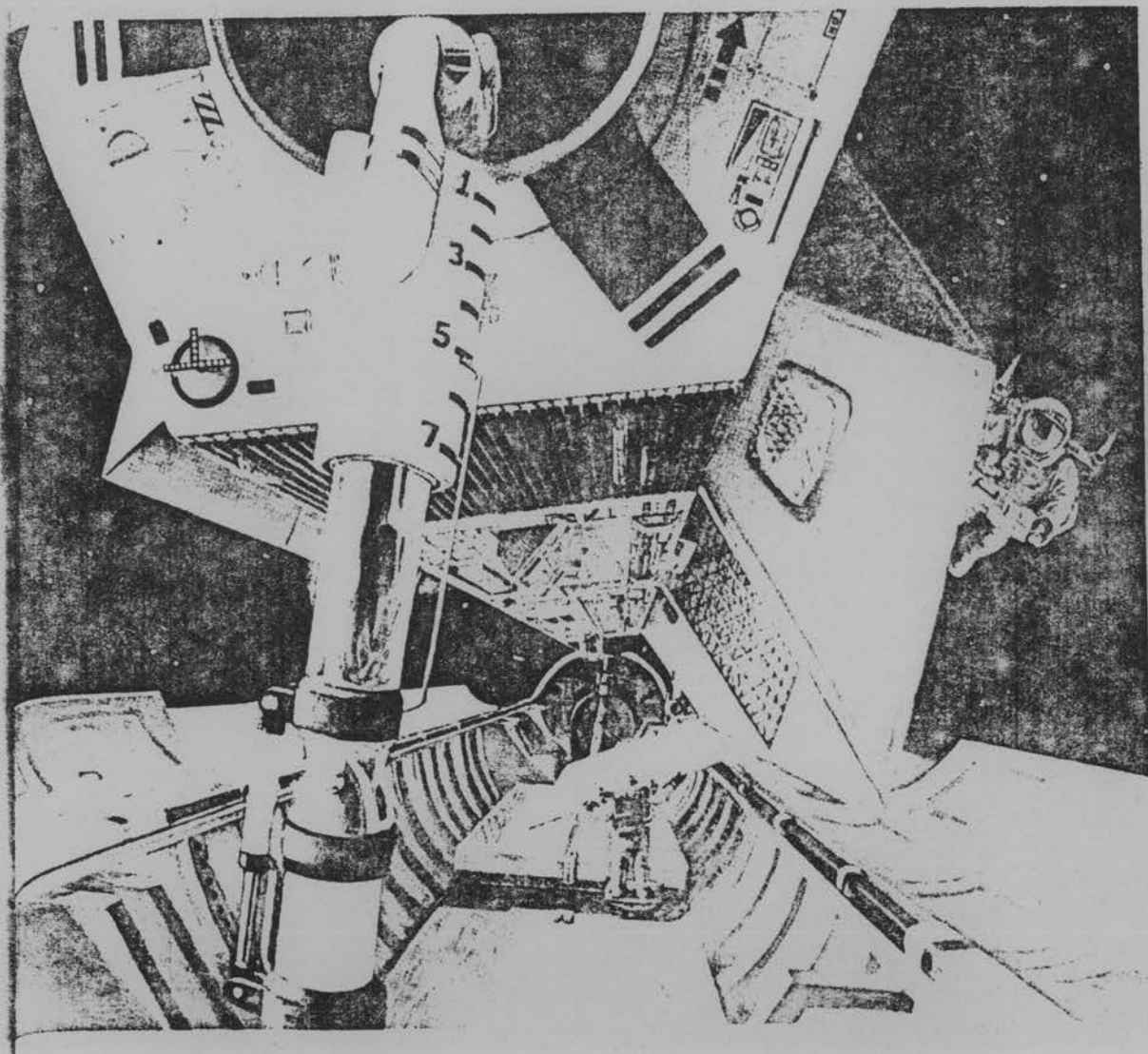
Since space activities are exciting the Center should be dynamic in form.

Since the Center's purpose is to educate the public about the immediacy of space activities its form should emphasize the man in spaceman.

Since the site is at the west edge of the nearly "invisible" cultural center along a busy traffic route the Center's form should indicate the cultural center's existence to passersby.

Since space activities are developing and growing at an accelerating pace the Space Center should adapt to that change through time.

Since the zoo study proposes a people mover system connecting all cultural facilities the center should potentially accommodate a connection.



bibliography

Basic Museum Management edited by George Macbeath and S. James Gooding
Canadian Museums Association, Ottawa Ontario, 1969

A primer for museum operation, it gives a good discussion of the principles involved. Chapters on staff, building, purpose, etc.

Museums and Monuments: No. 9 "Organization of Museums Practical Advice"
UNESCO, 1960

A step by step cookbook to museum administration, design, and operation.

Your Future in Museums by William A. Burns MA. Ed.D., Richard Rosen Press,
29 E. 21, New York, NY 10010, 1967.

A detailed account of jobs and careers in museums, source of typical organization chart.

American Association of Museums Publications New Series 1-10
Robinson: "The Behavior of the Museum Visitor" 1928

A landmark study referred to in all the other sources.

Aviation and Space Museums of America by Jon L. Allen, Arco Publishing Co.,
219 Park Avenue South, New York, NY, 1975.

A bibliography with photos and short descriptions.

Recommendations of the Science Center Planning Committee
Science Center Planning Committee, Oklahoma Science and Arts Foundation, August 1976.

A preliminary program for the Omniplex.



Al Bean urinating in Skylab II. Just in front of his knee is the air-flushed fecal containment system, which you back up to. There's no particular "up" in this picture. The surface nearest Al's head was the floor when the spacecraft was launched. Note soap floating by sink.

appendix

The appendix is comprised of photocopies of articles related to the project, Oklahoma City zoning law, excerpts from the 1968 Northeast Oklahoma City Development Study and Zoo Plan, and the preliminary studies for the Alabama Space and Rocket Center.

THE APPENDIX IS UNDER SEPARATE COVER.

THE FOLLOWING IS ESSENTIAL SITE DATA FROM THE APPENDIX.

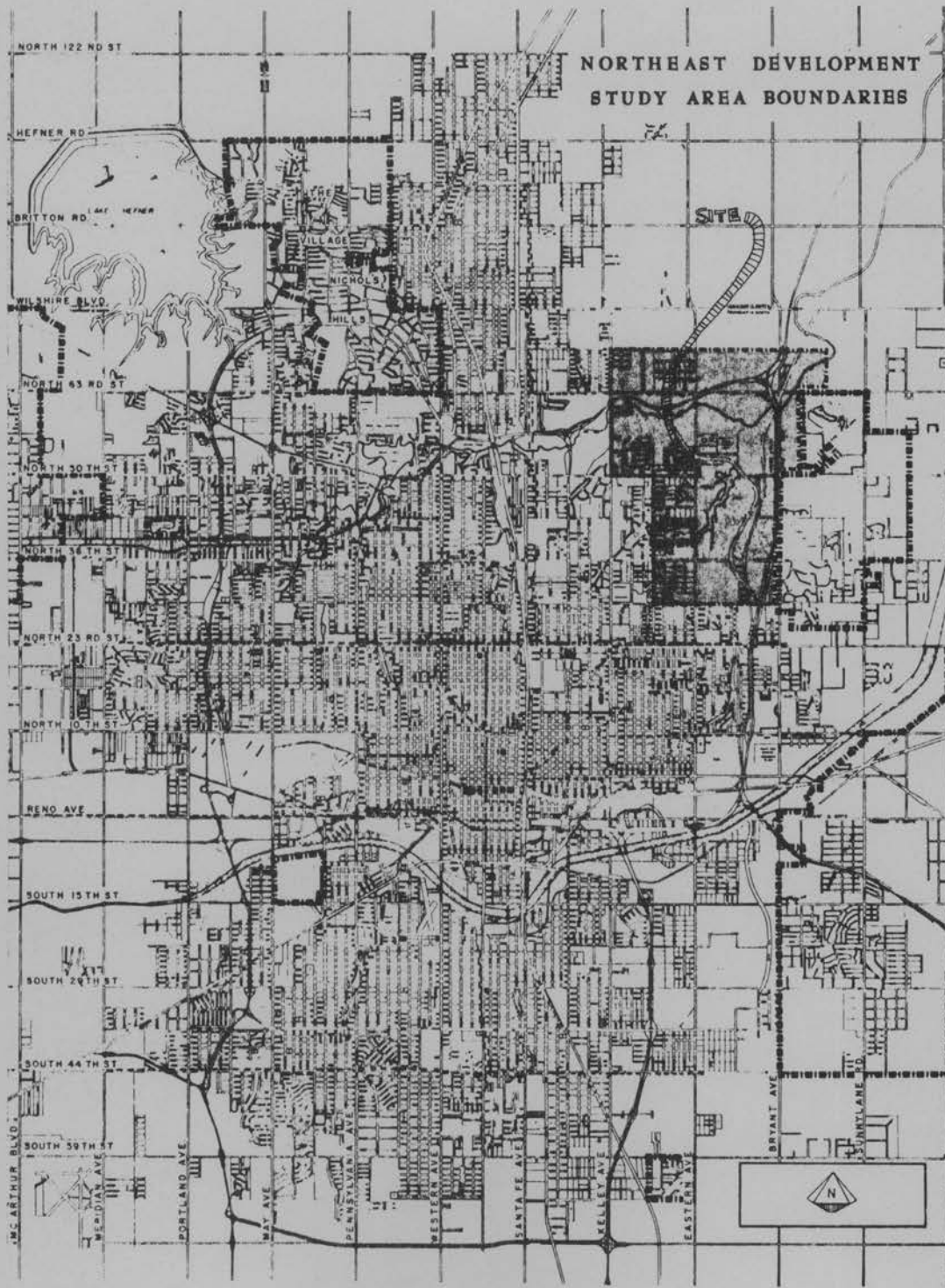


Figure 1

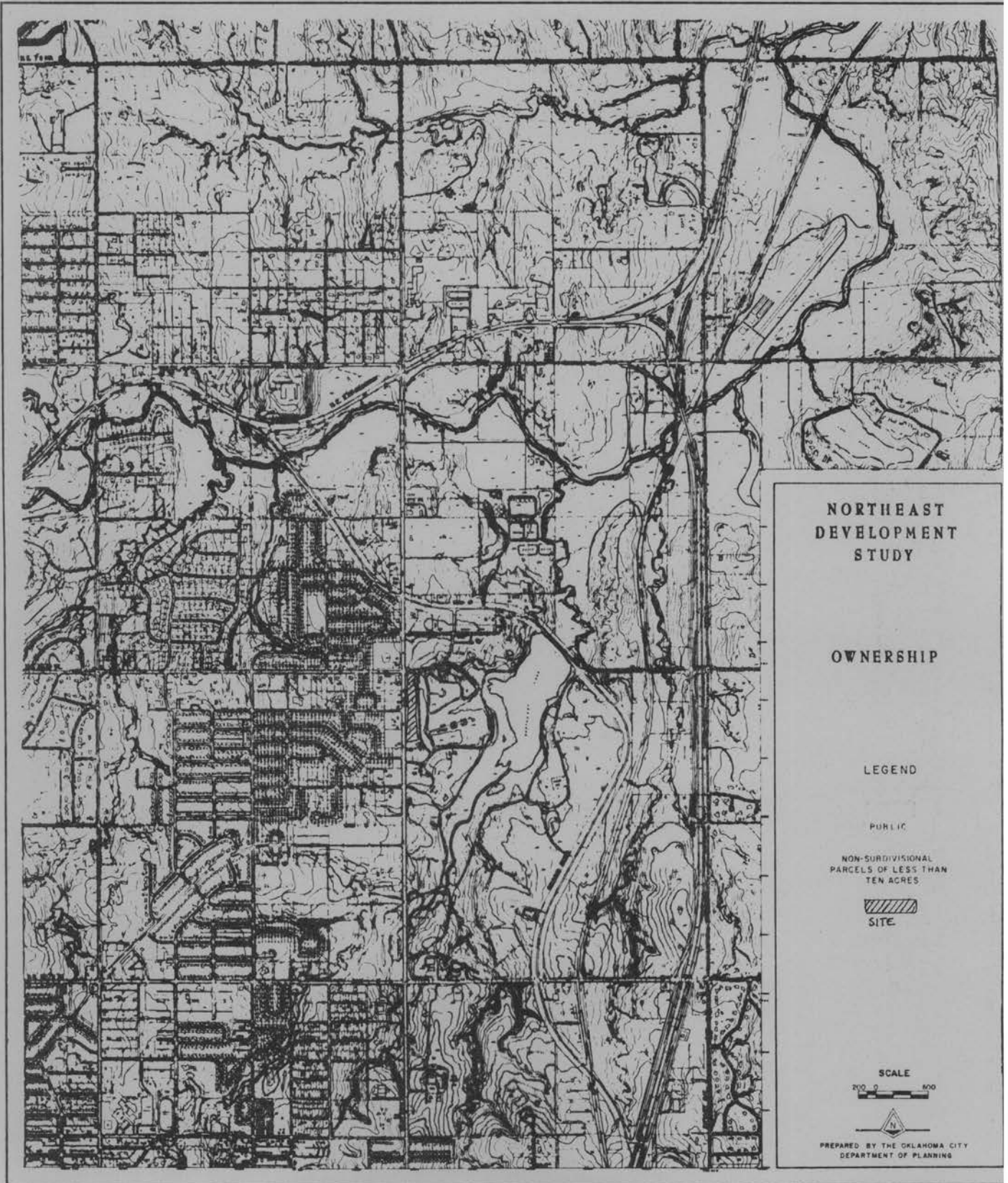


Figure 2

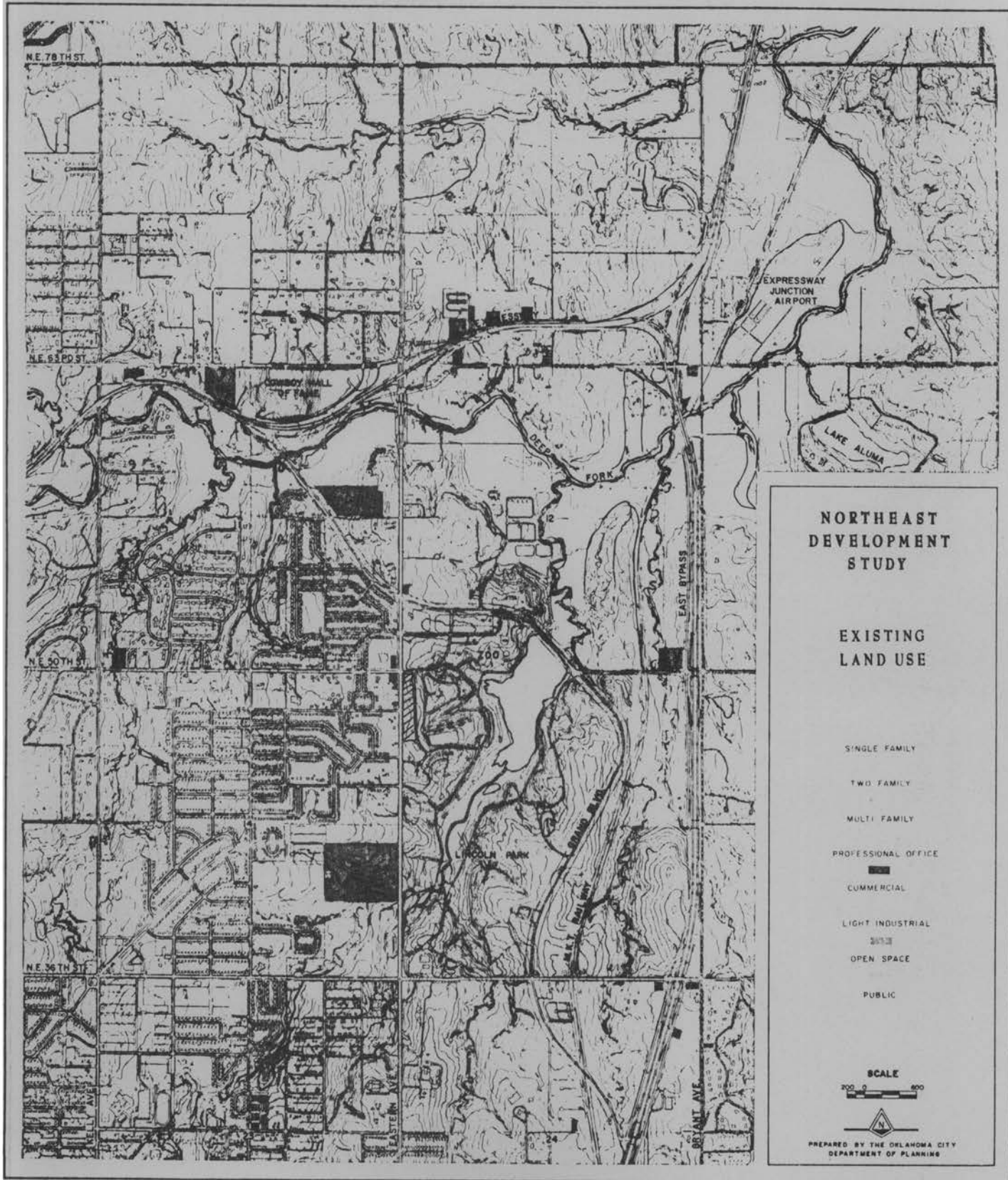


Figure 3

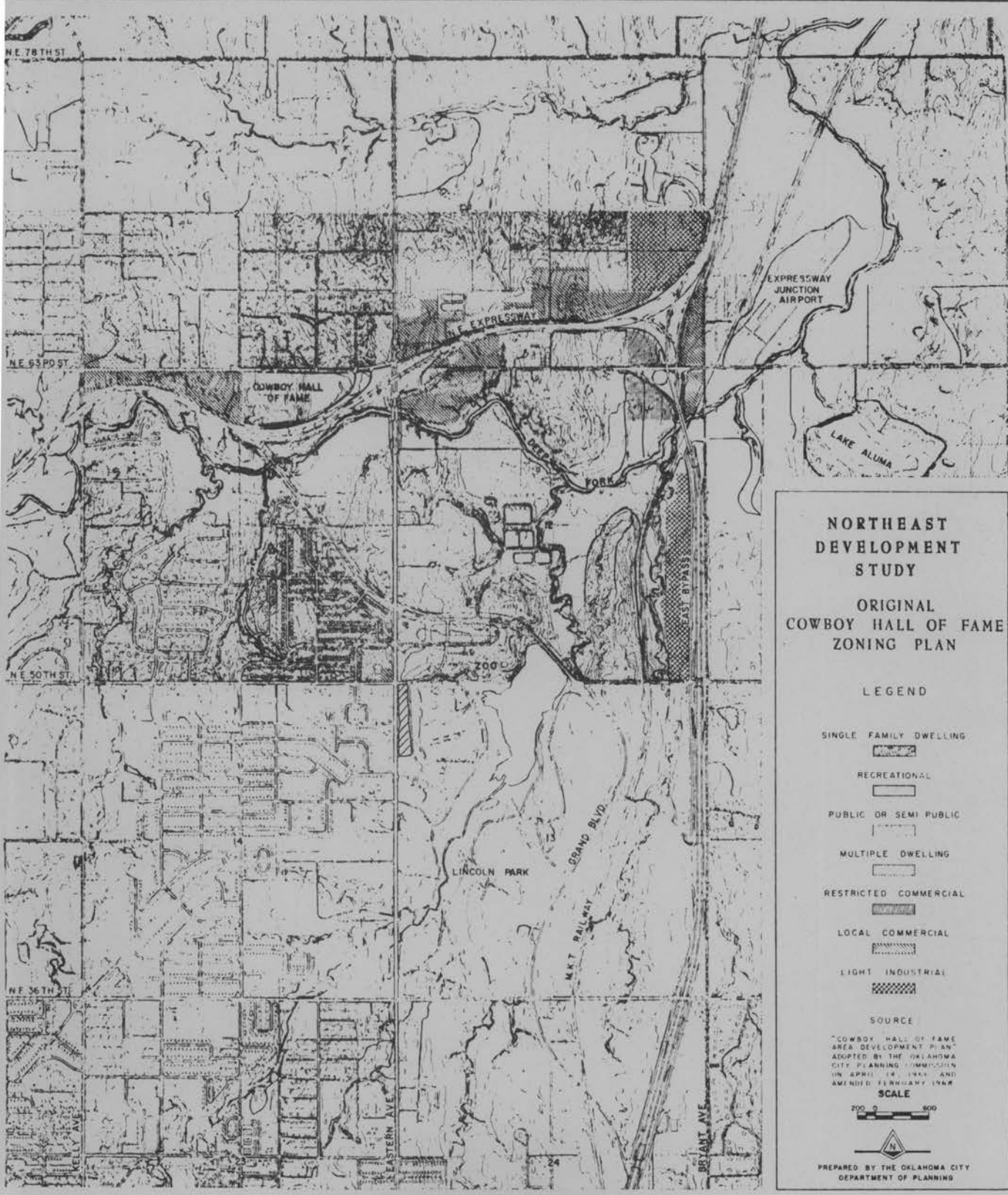


Figure 4

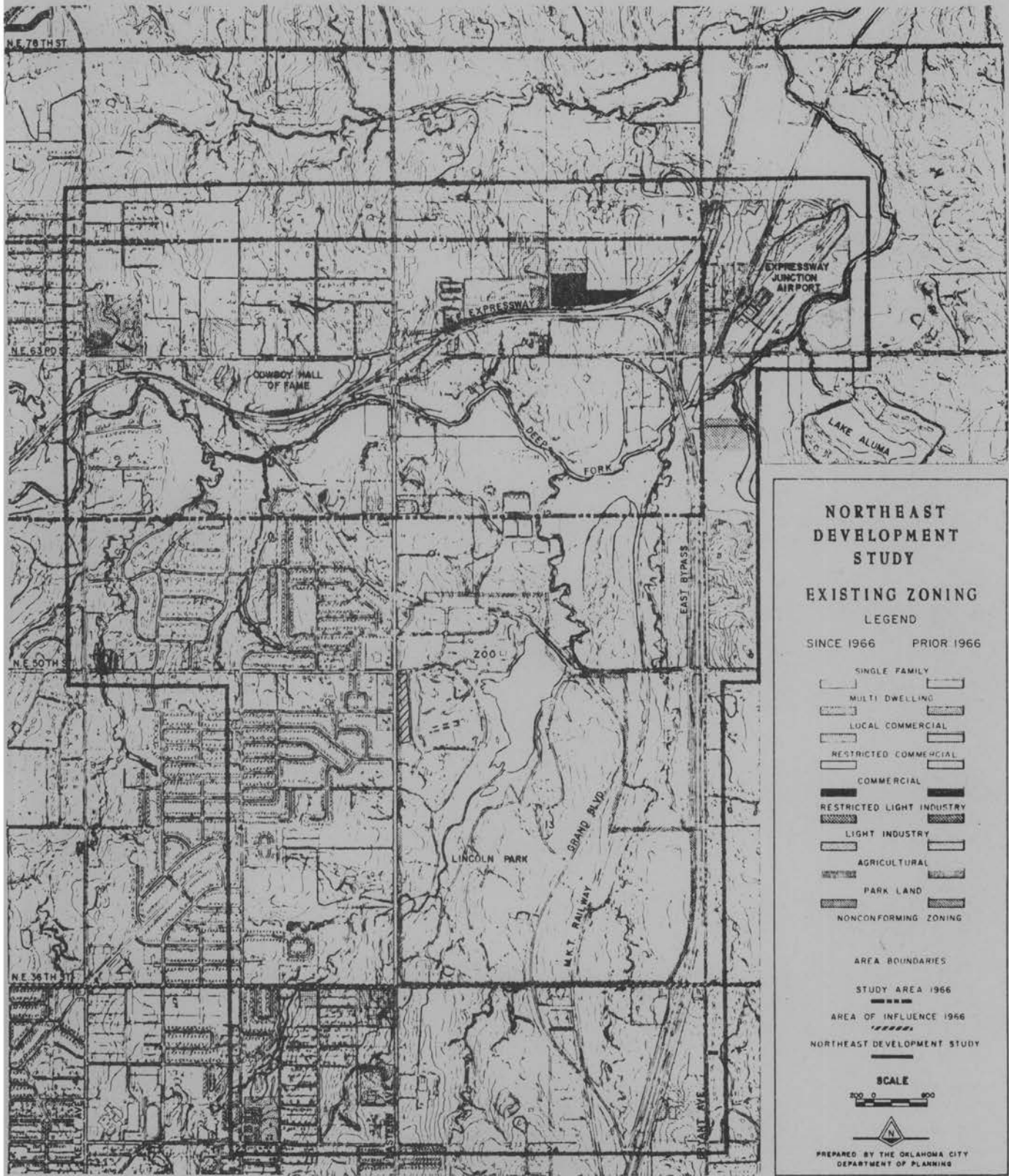


Figure 5

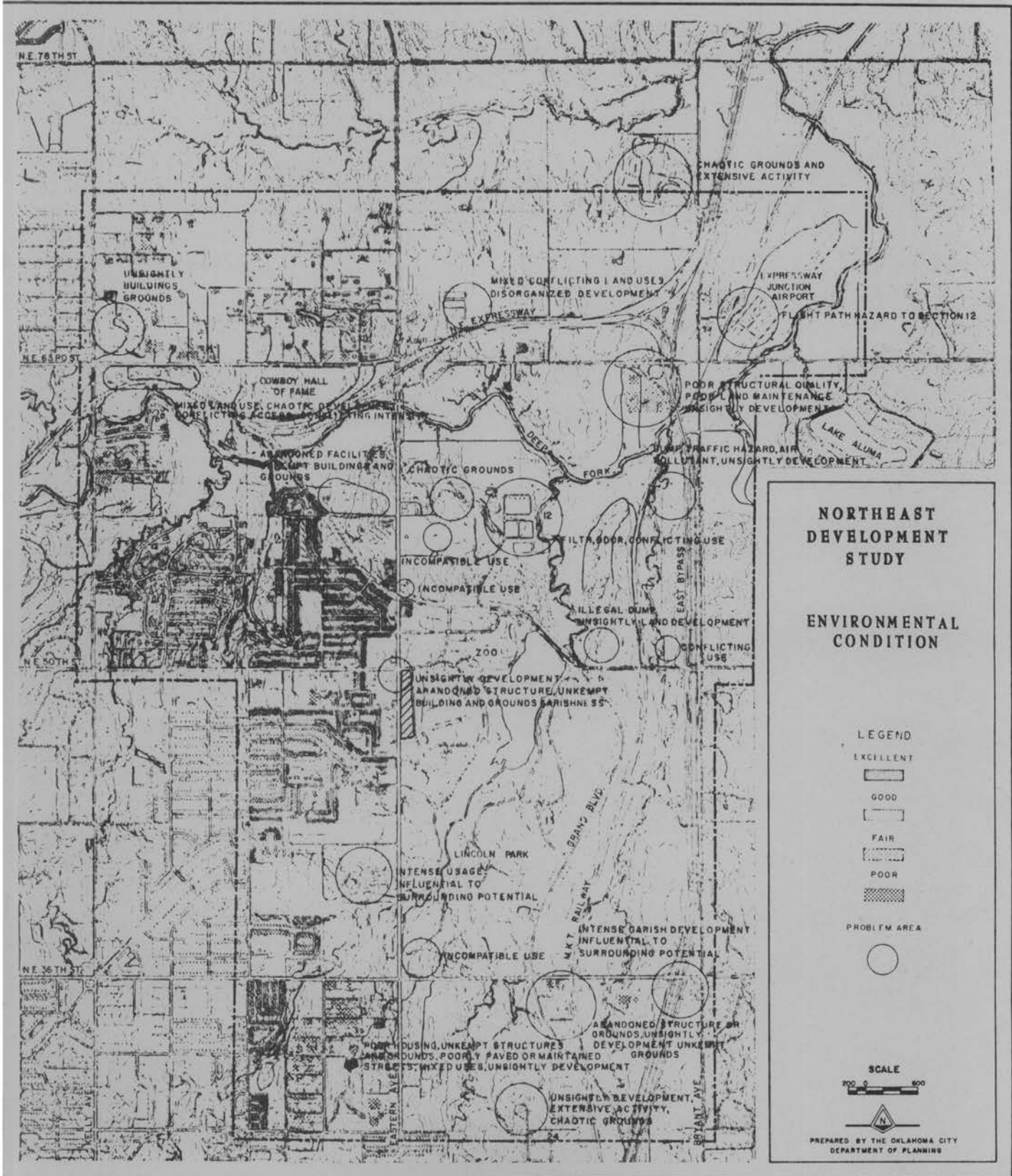


Figure 6

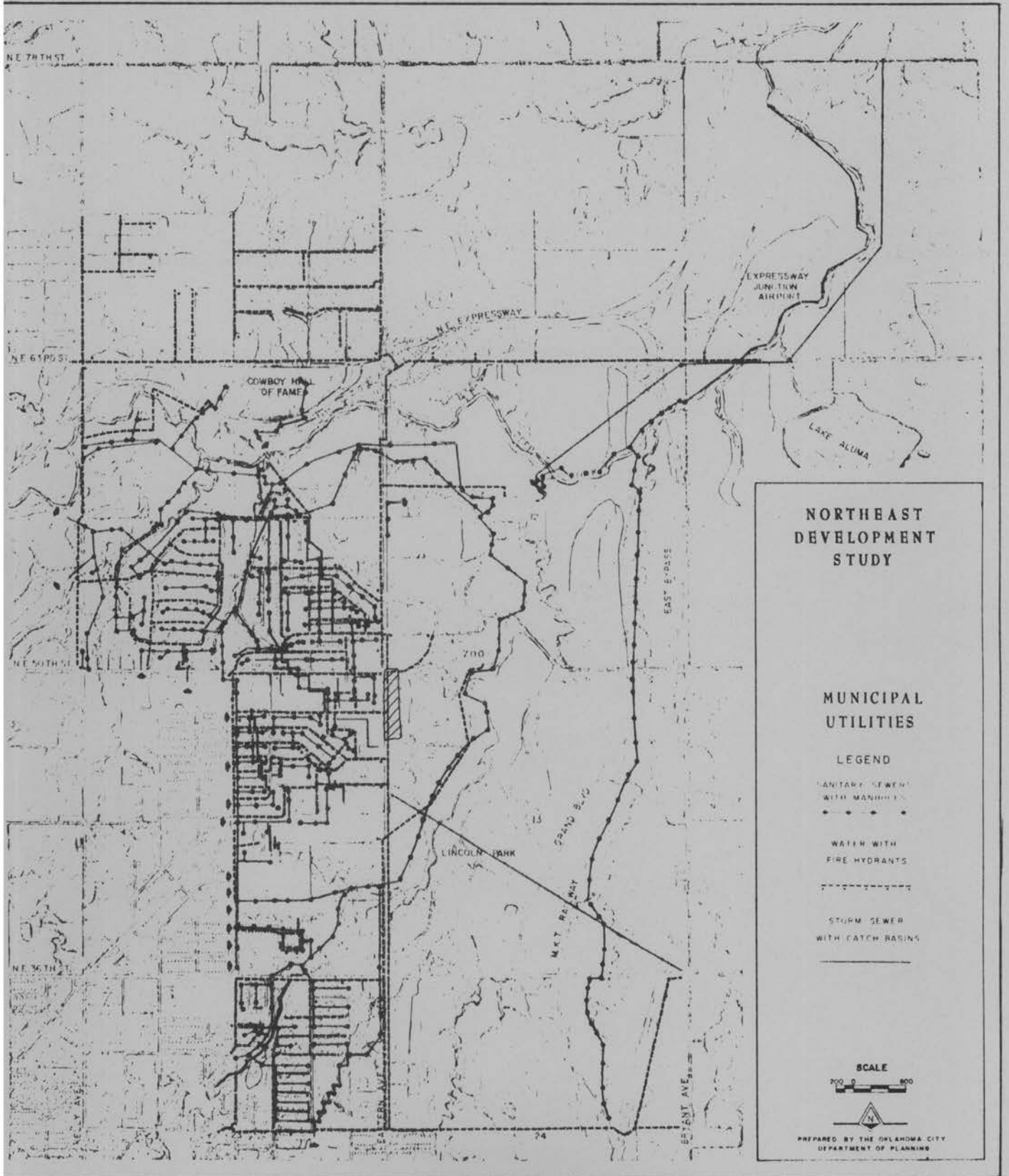


Figure 7

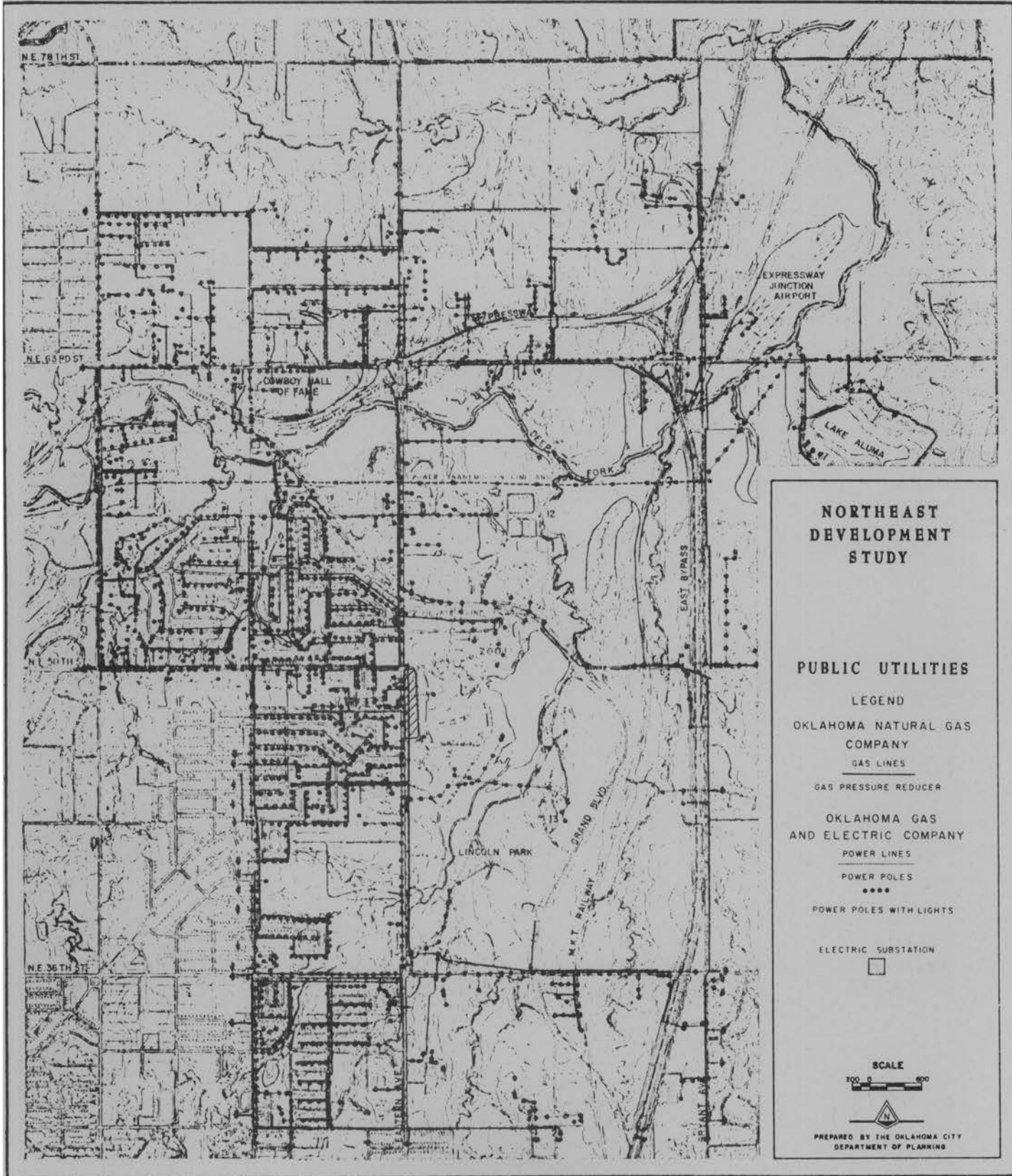


Figure 8

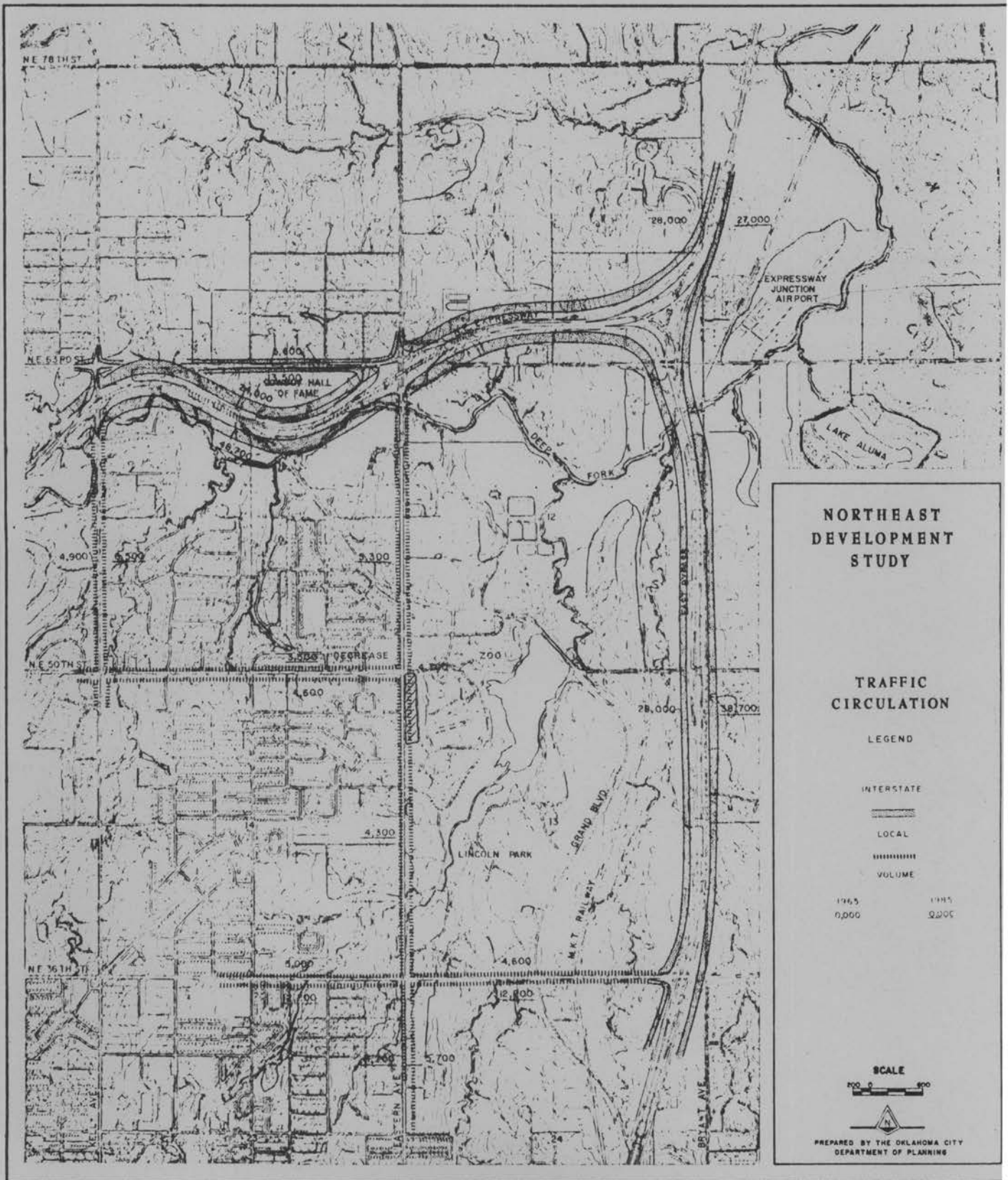


Figure 9

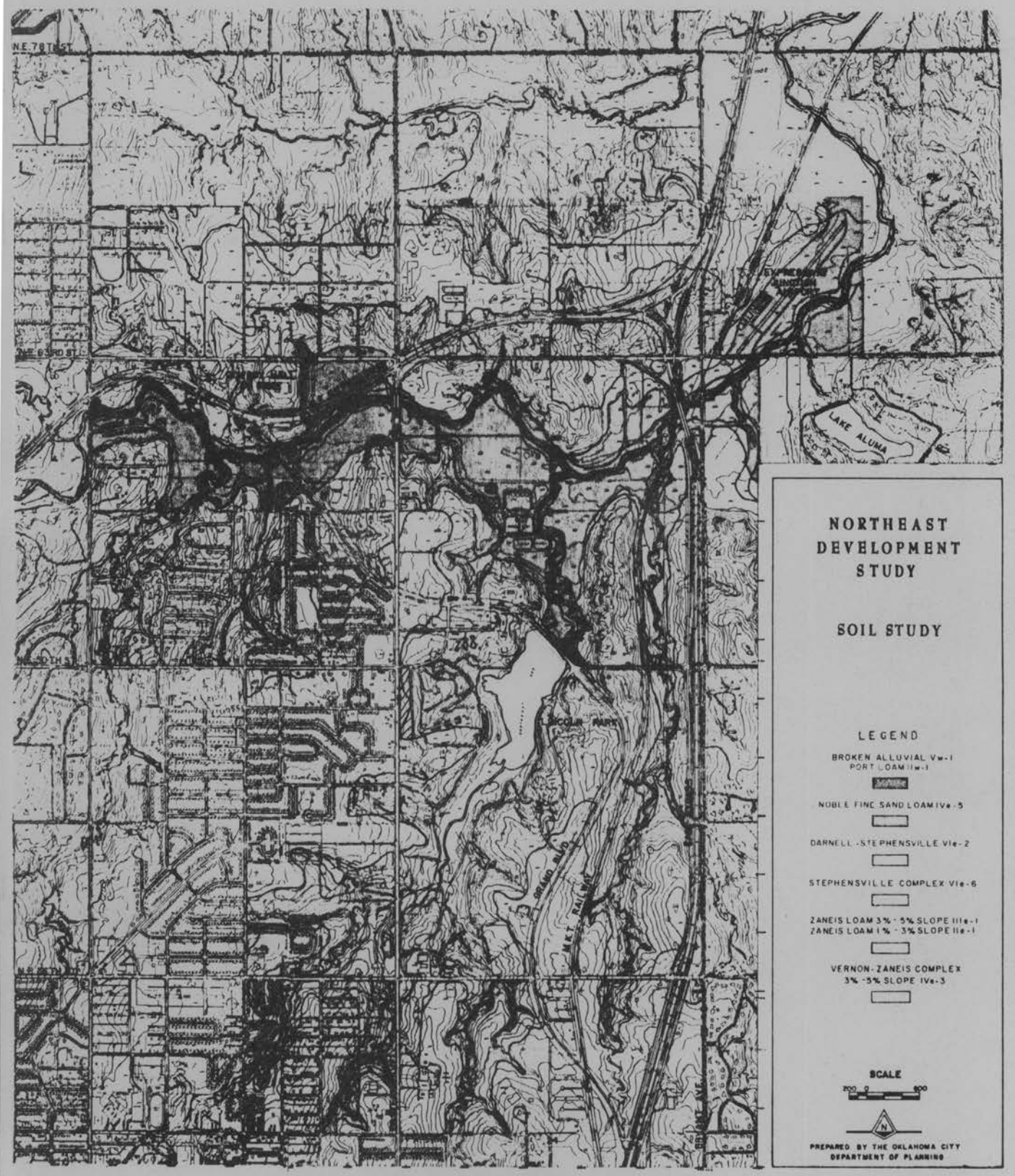


Figure 10

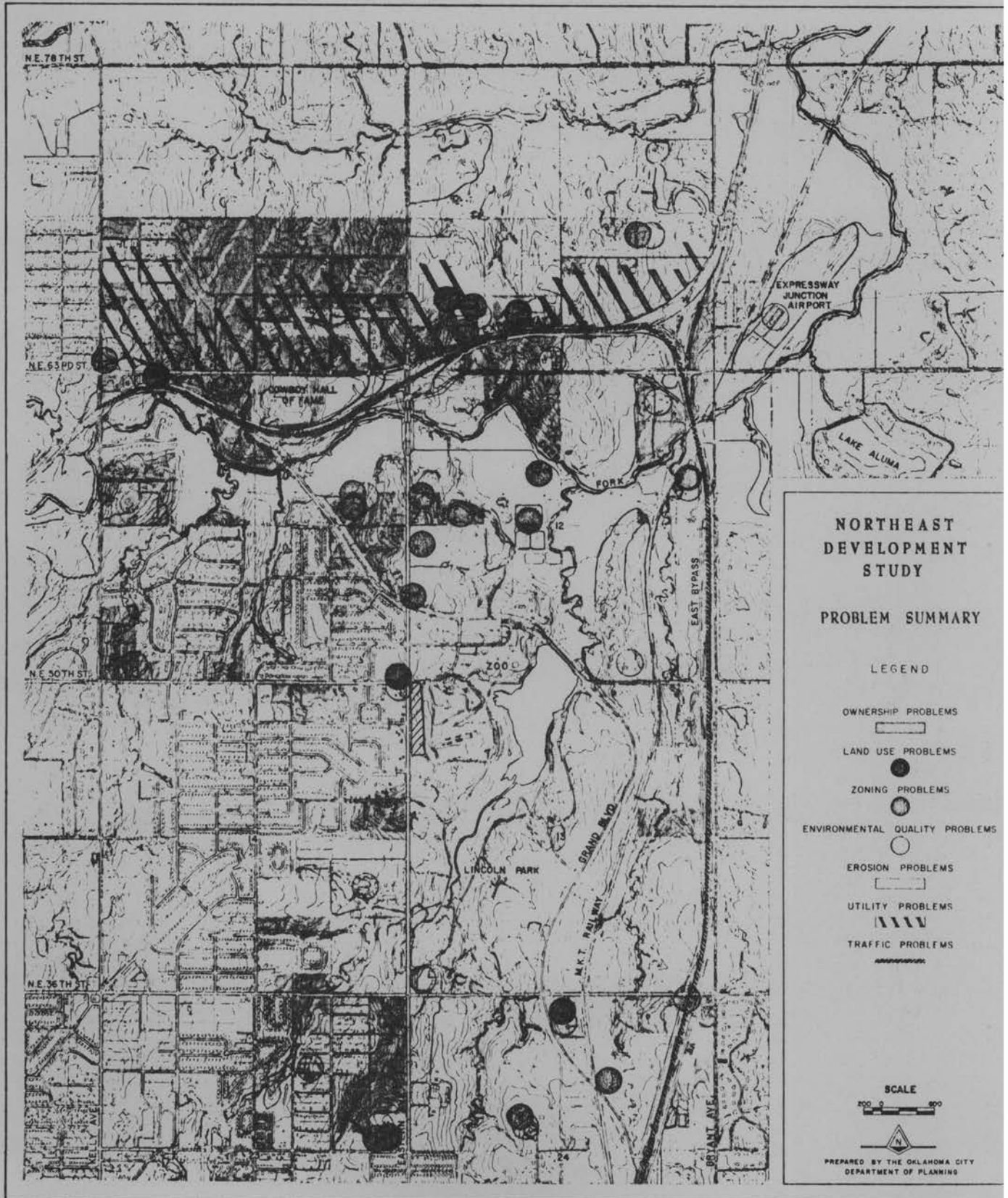


Figure 12

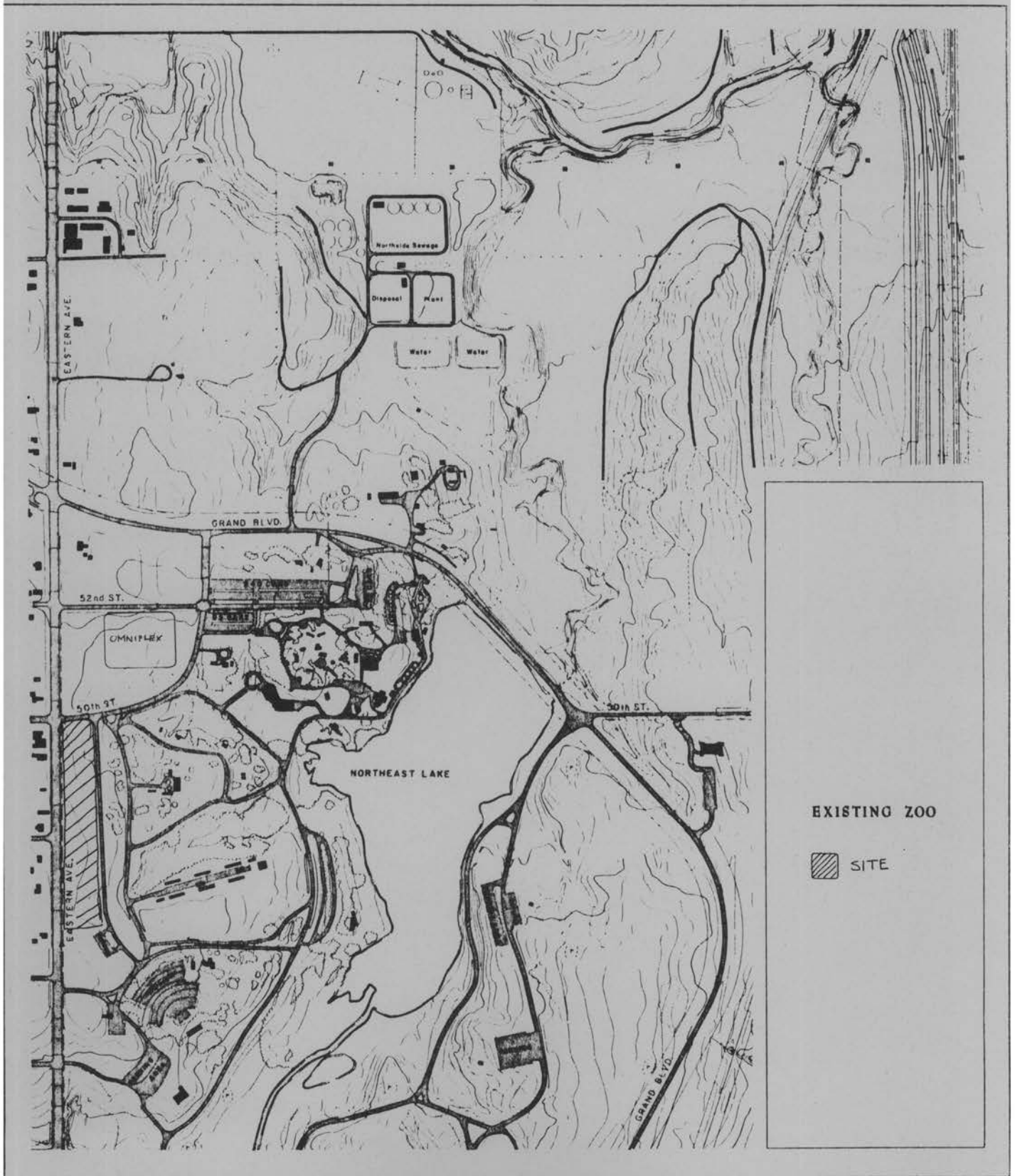


Figure 14

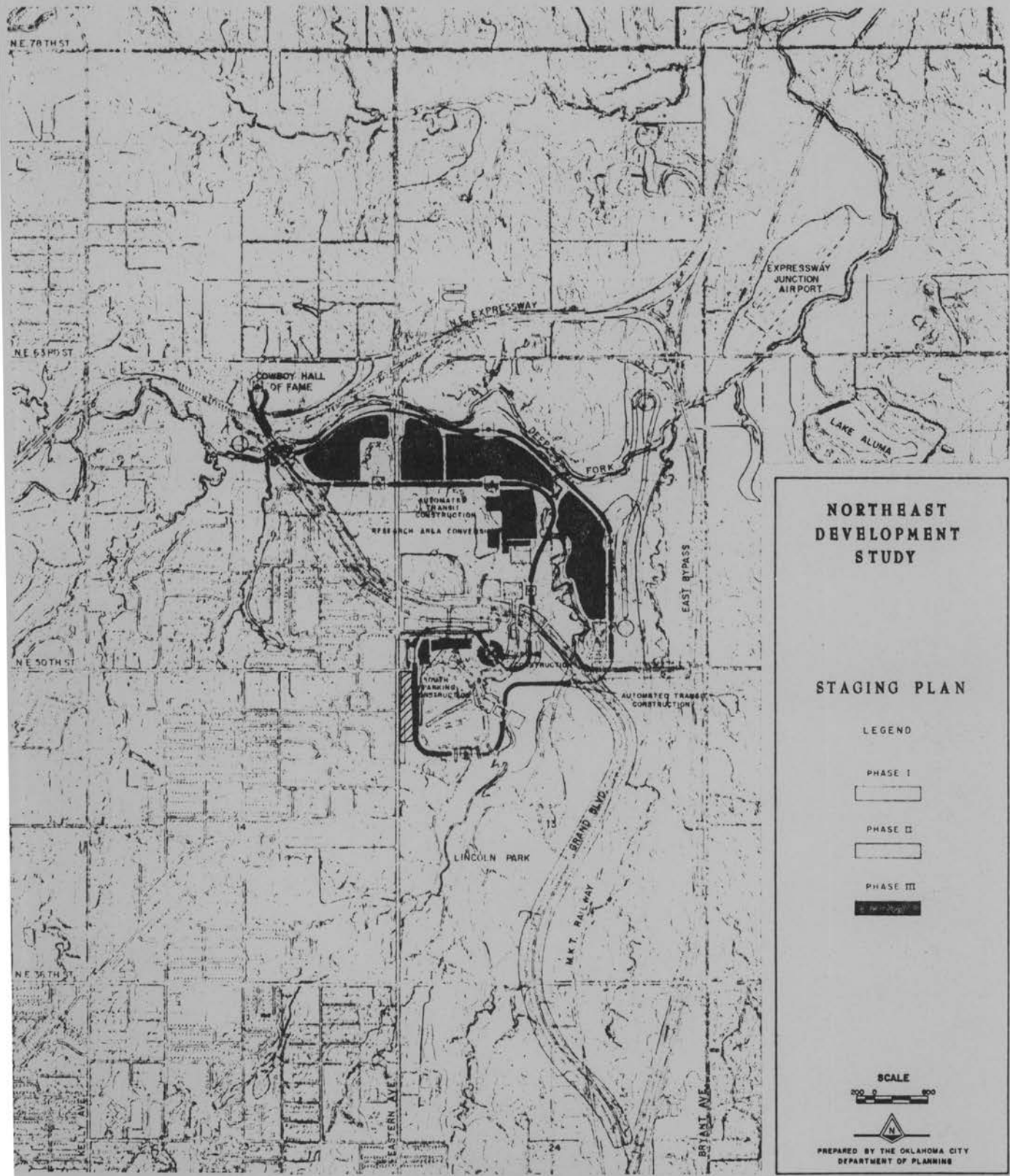
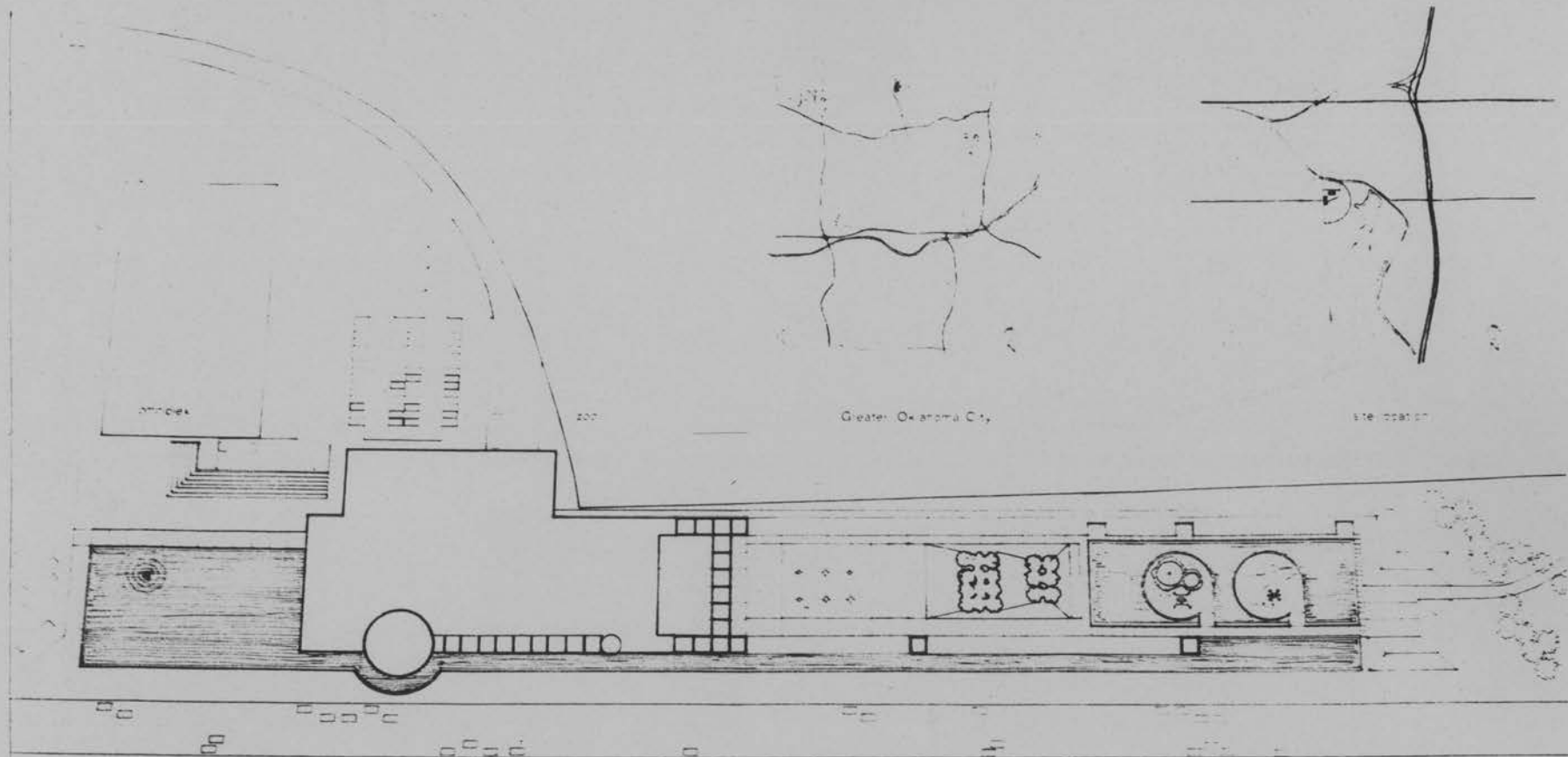


Figure 20

a
design
solution

drawings

1. Site
2. Lower Level Plan
3. Upper Level Plan
4. Mechanical Diagram/Structural Grid
5. Roof Plan
6. Elevations
7. Elevations
8. Sections
9. Sections
10. Details
11. Exterior Perspective
12. Interior Perspective



annex

200

Greater Oklahoma City

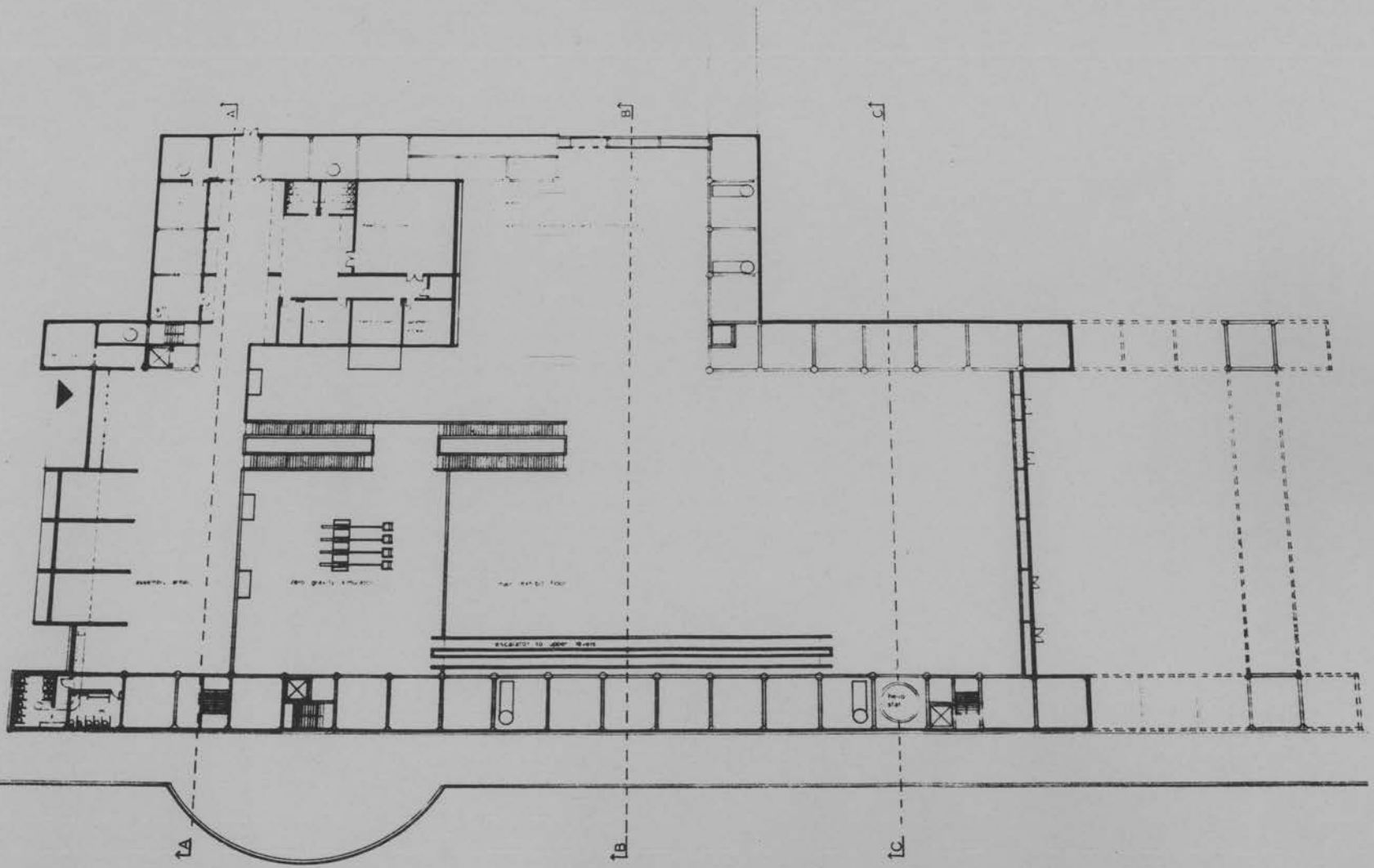
site location

site plan



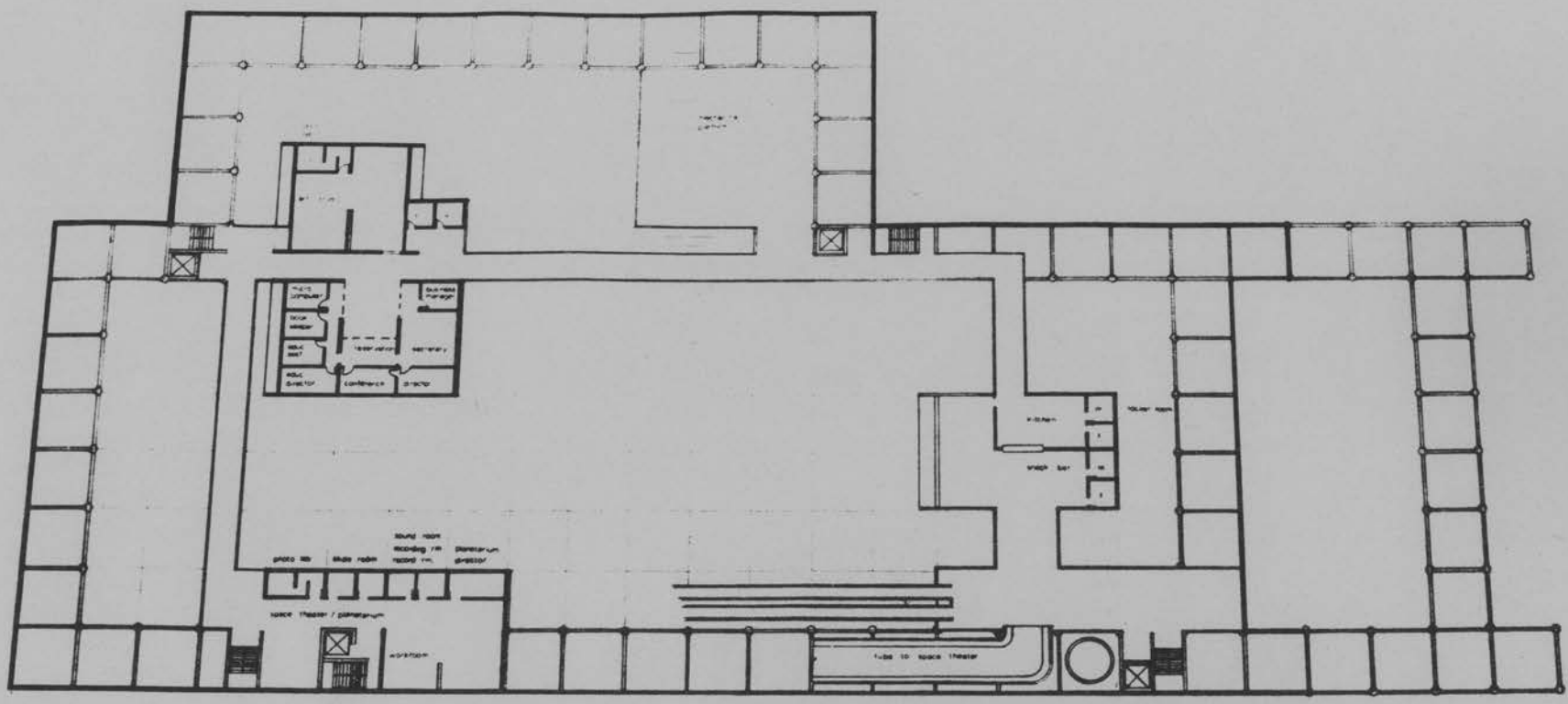
site section

scale ft 1" = 10' 0"



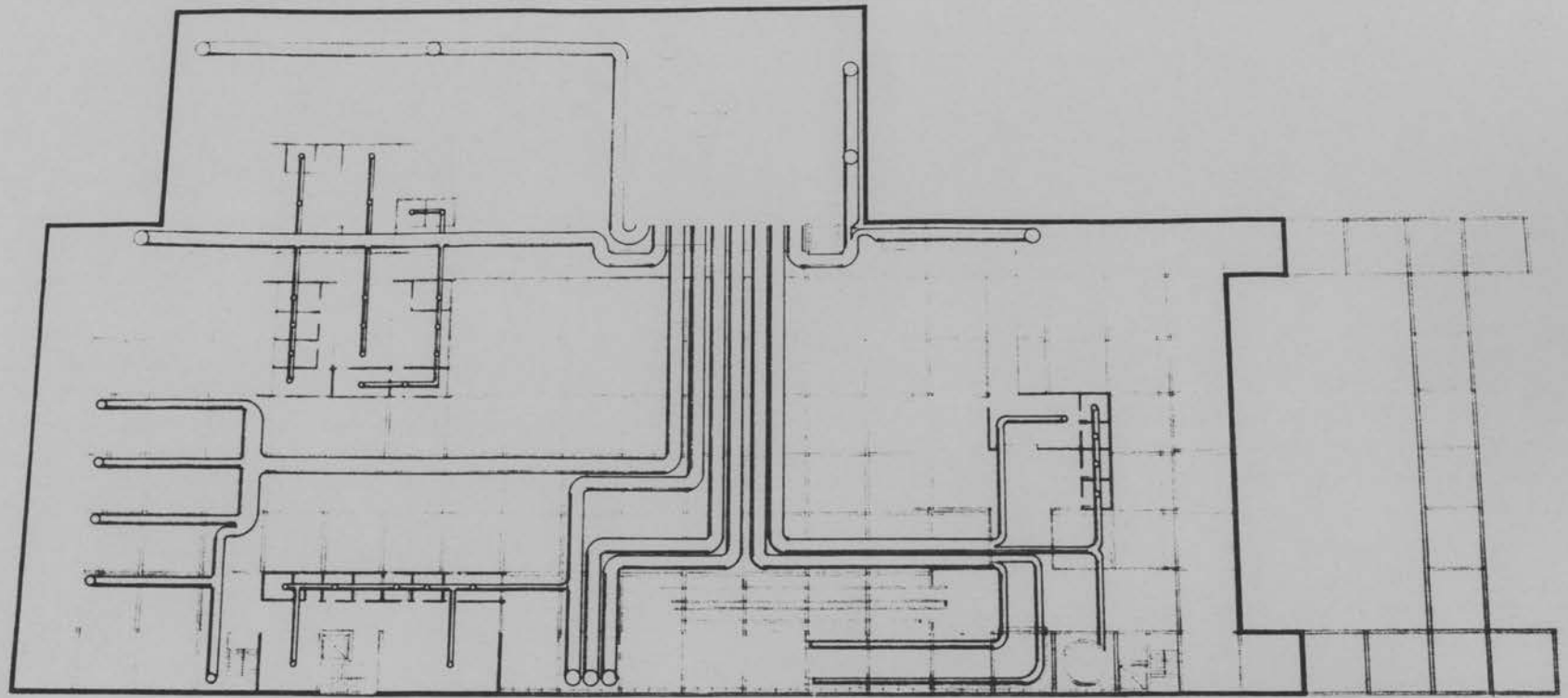
lower levels plan

scale ft.



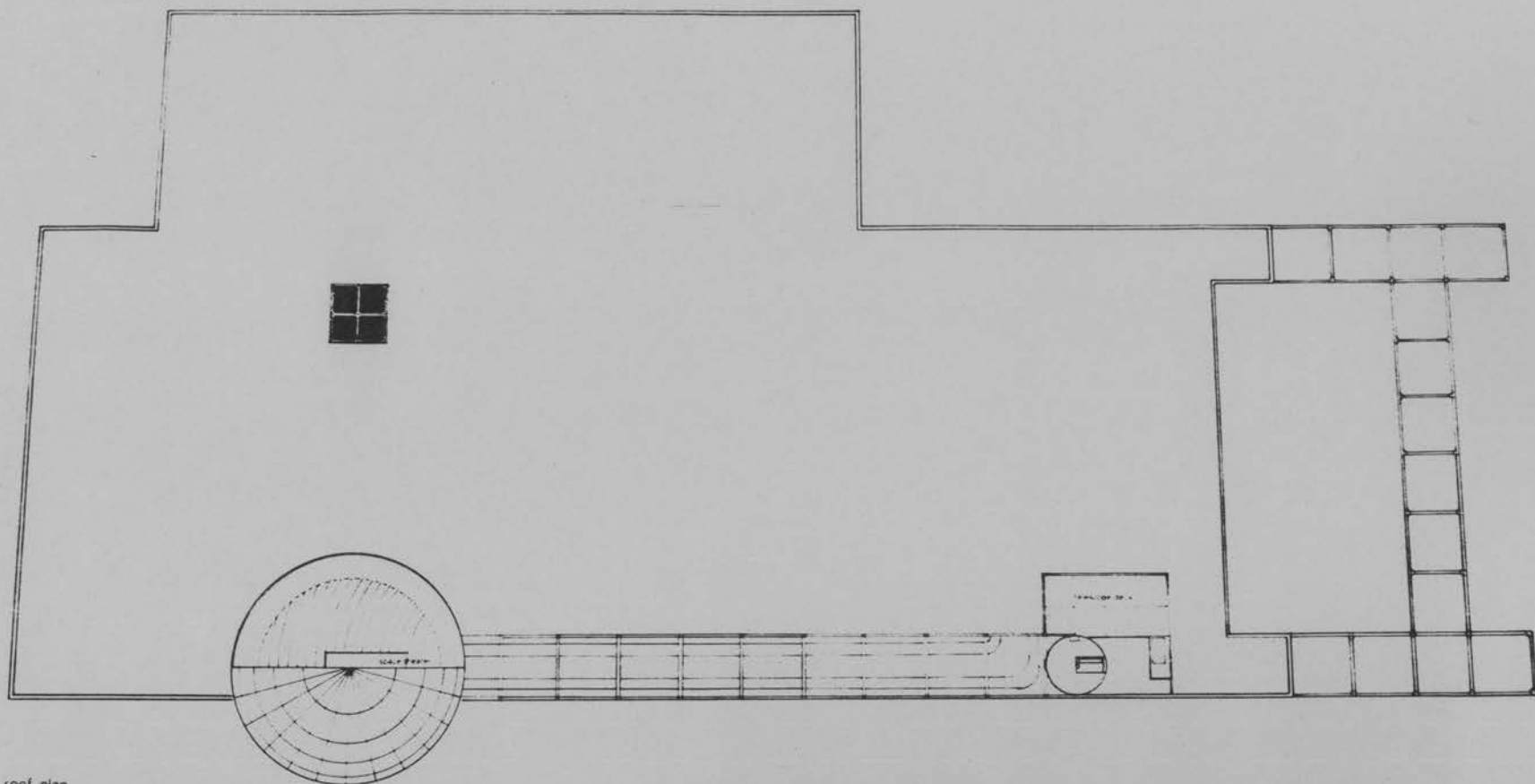
upper level plan

scale ft. 1/8" = 1'



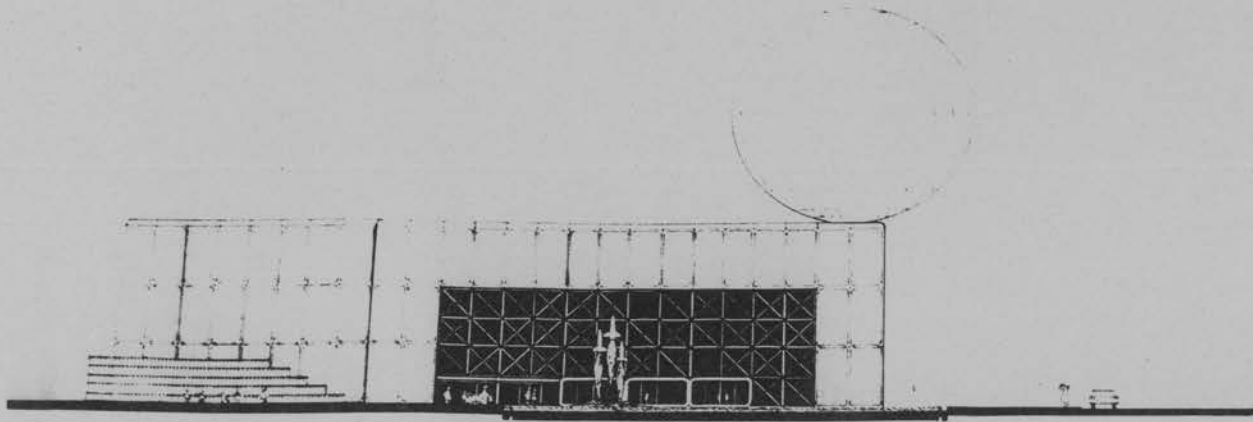
mechanical layout-structural grid

scale ft.  0 10 20 30 40



roof plan

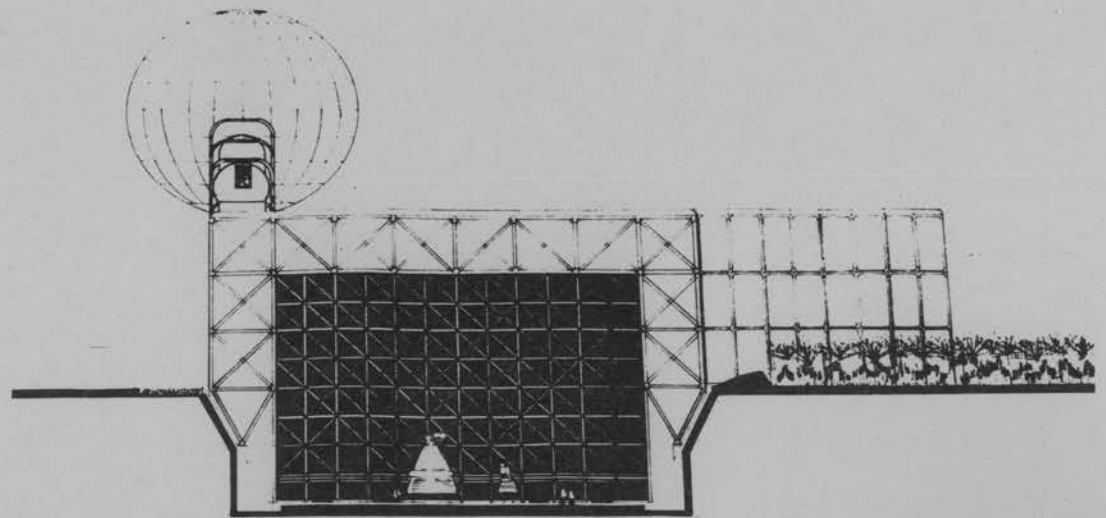
scale ft. 1/8" = 1'-0"



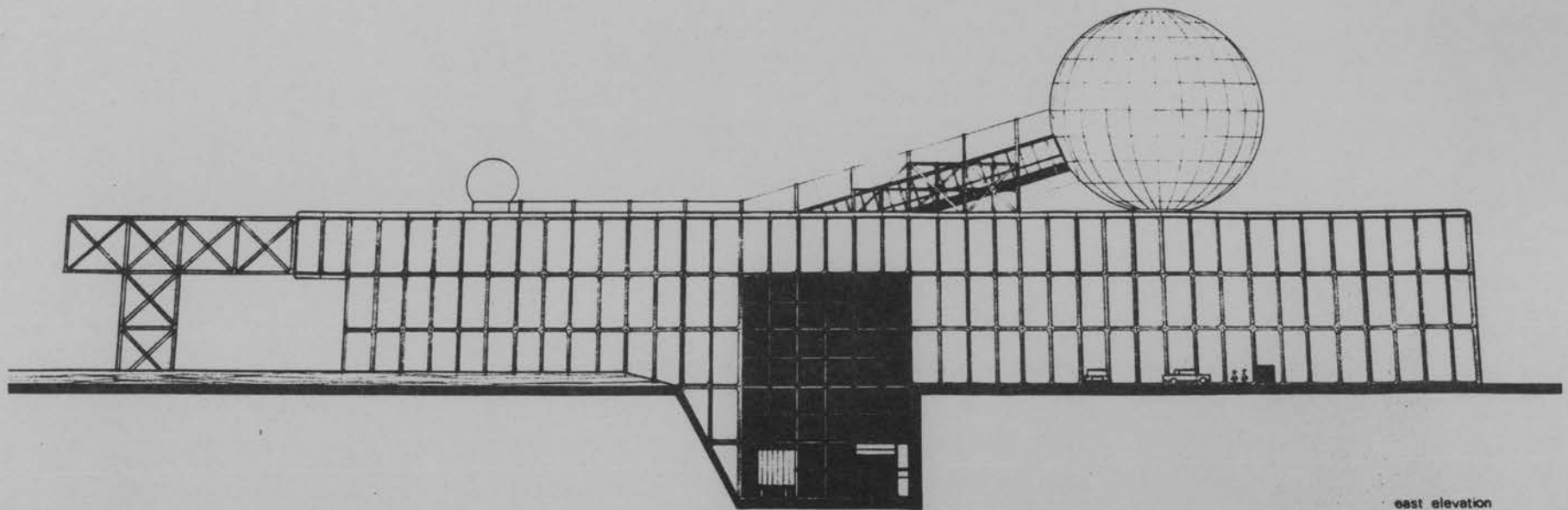
east elevation



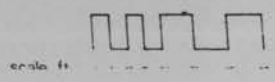
west elevation



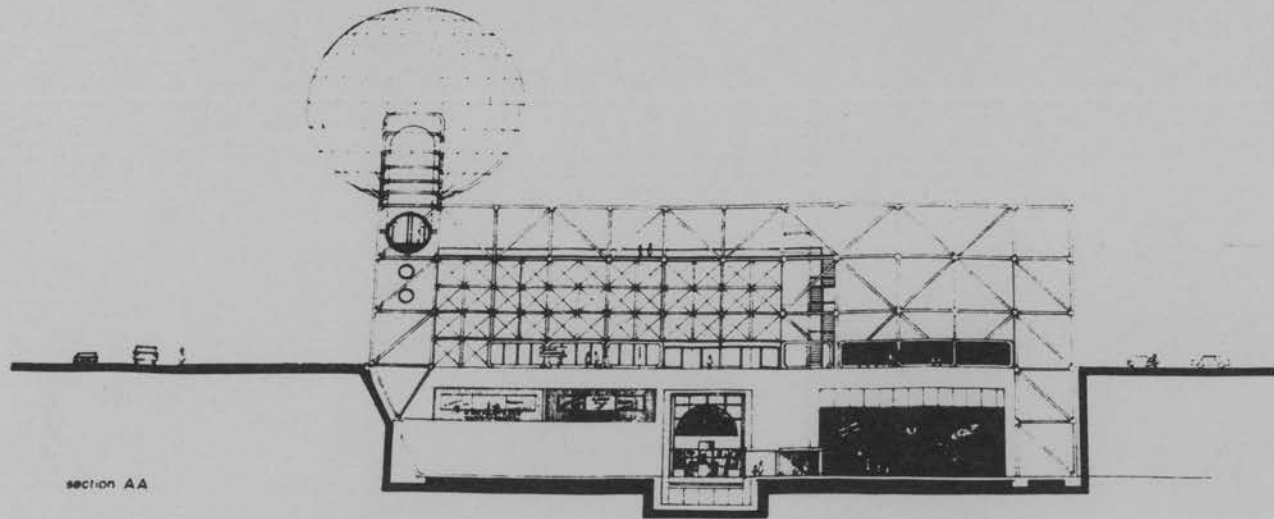
south elevation



east elevation

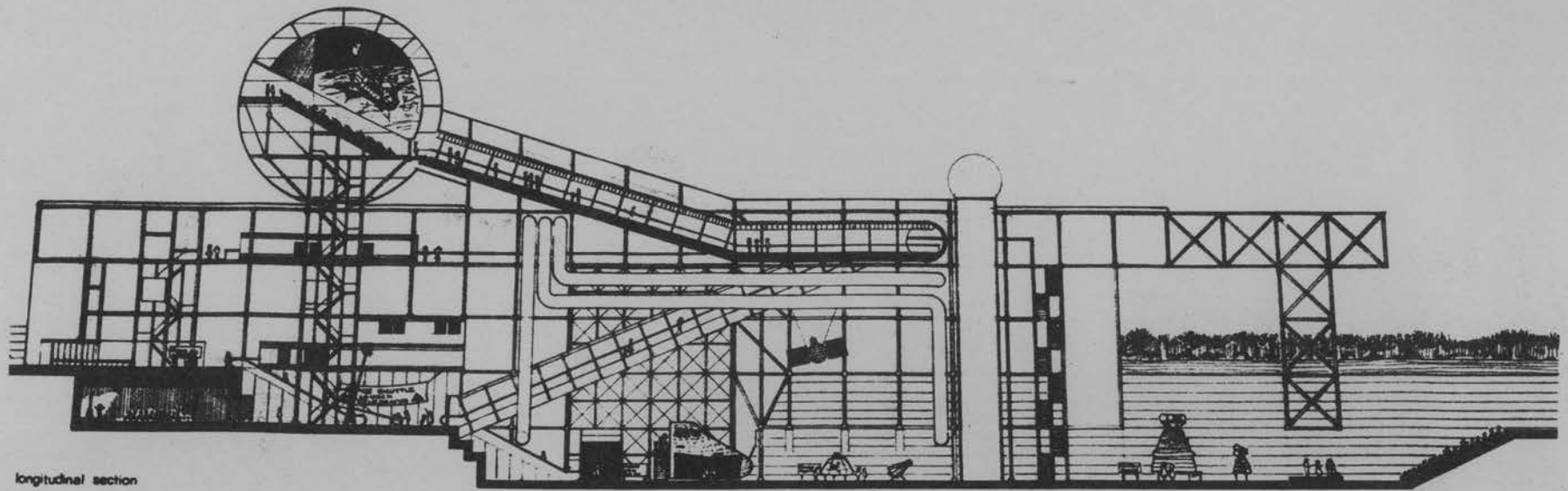


scale ft.

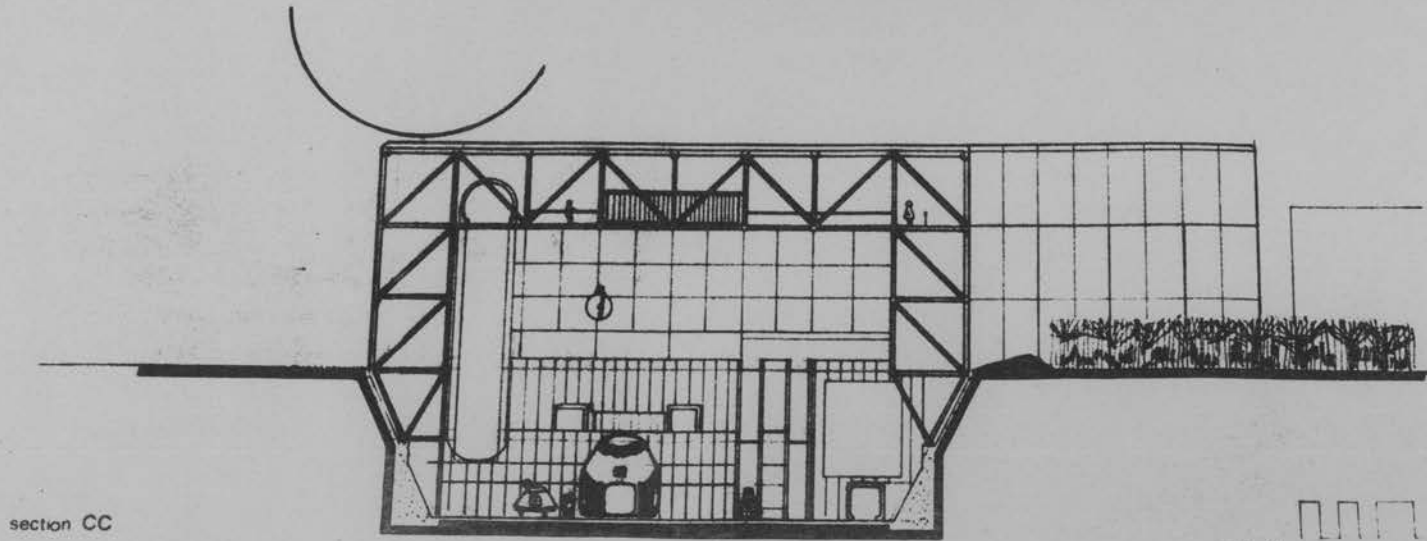
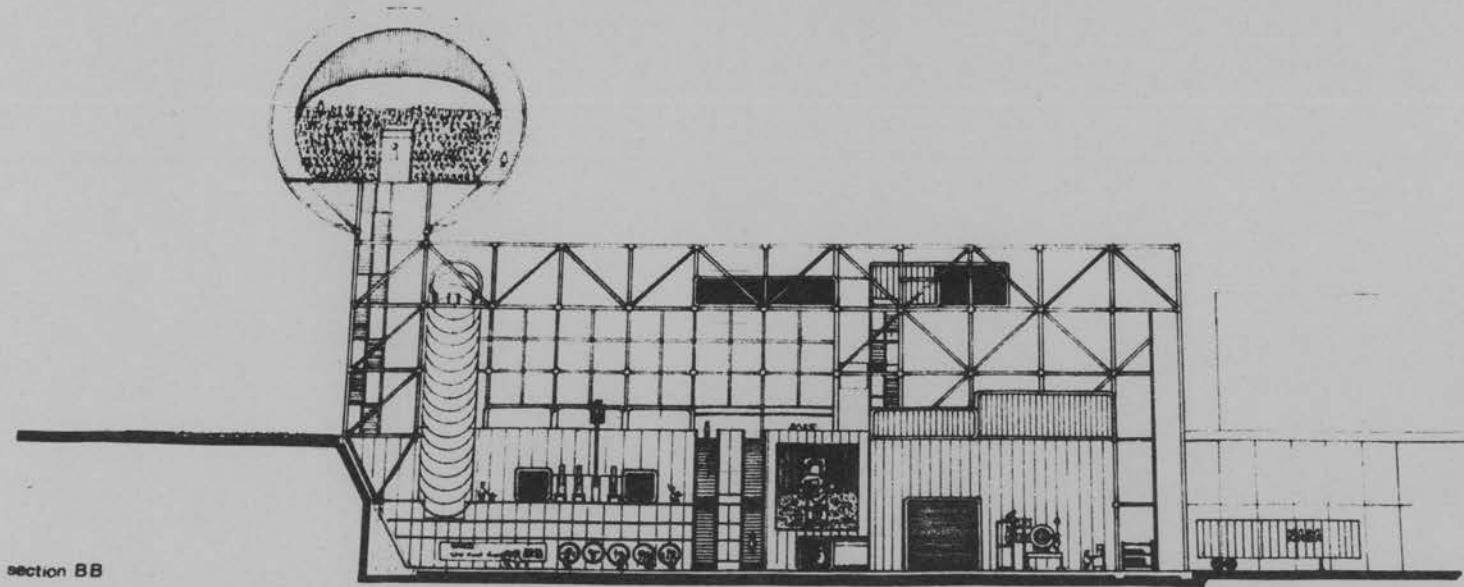


section AA

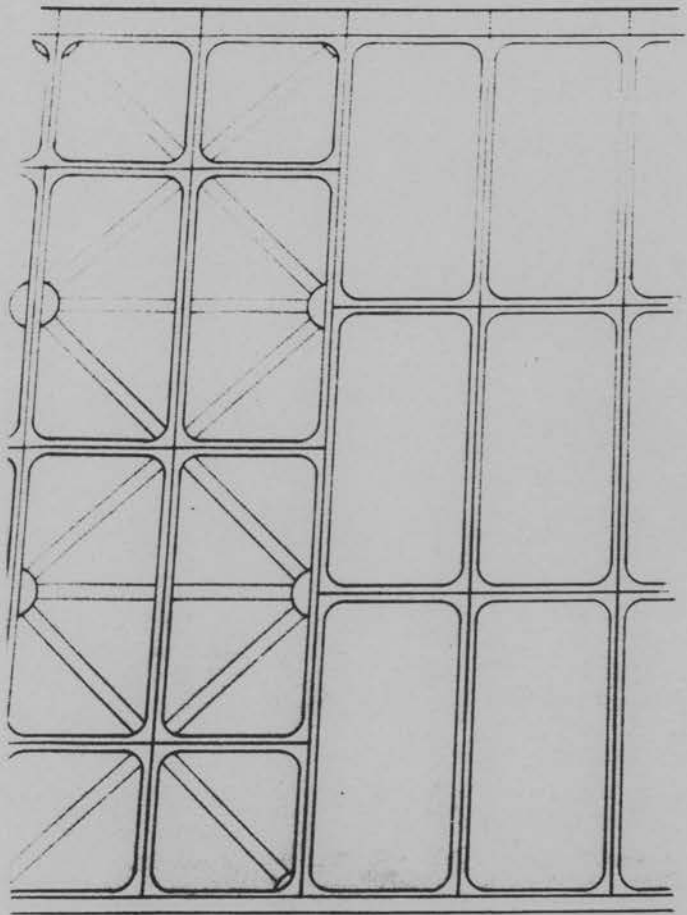
scale ft. 1" = 10'



longitudinal section

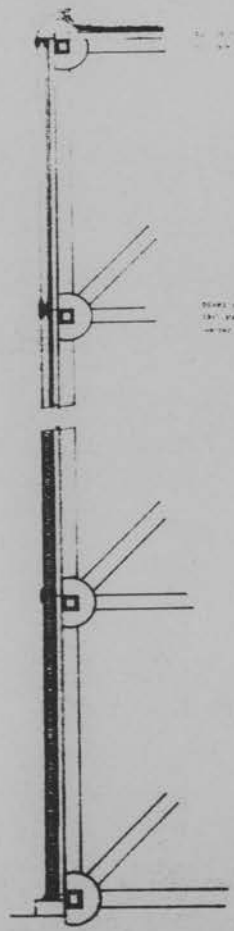


scale ft. 0 1 2 3 4 5 6

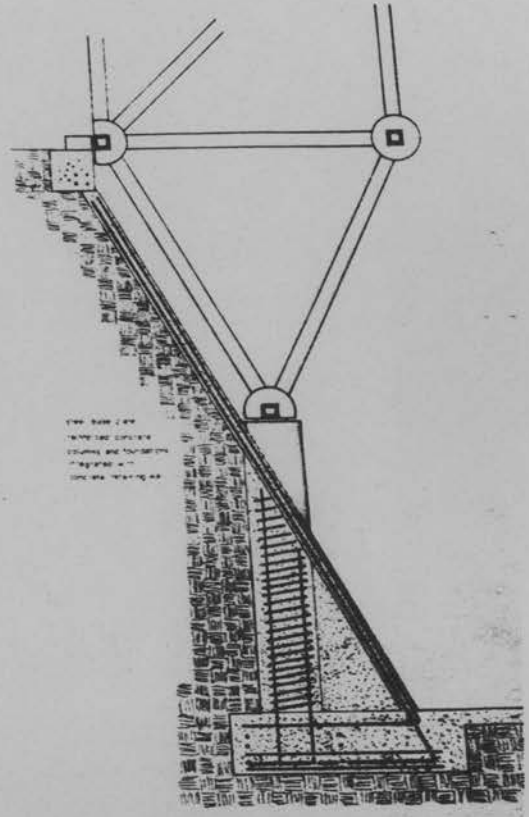


SECTION 1
 1/4" = 1'-0"

SECTION 2
 1/4" = 1'-0"



SECTION 3
 1/4" = 1'-0"



SECTION 4
 1/4" = 1'-0"

Details
 scale ft. 0 1 2 3 4

