



MUNICIPAL CENTER FOR TEMPE, ARIZONA

by

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of the Requirements for the
Degree of Bachelor of Architecture
at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

June, 1965

Author _____
Department of Architecture, April 5, 1965

Certified by _____
Thesis Supervisor

Accepted by _____
Chairman, Departmental Committee on Theses

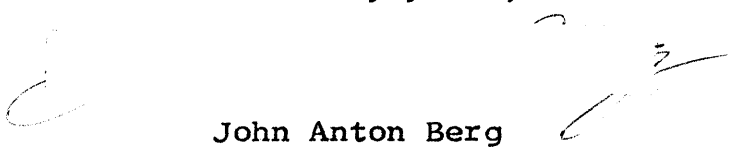
5 Westgate, Apt. E-1
Cambridge, Massachusetts
April 5, 1965

Pietro Belluschi
Dean of the School of Architecture
and Planning
Massachusetts Institute of Technology
Cambridge, Massachusetts

Dear Dean Belluschi:

In partial fulfillment of the requirements for the degree of Bachelor of Architecture, I respectfully submit my thesis, "A Municipal Center for Tempe, Arizona."

Sincerely yours,


John Anton Berg

ACKNOWLEDGEMENTS

I would like to acknowledge the following people for their work and support in the development of this thesis:

Mr. Louis C. Cooper, City Manager of Tempe
Mr. Harry Higgins, City Planner, Tempe
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ABSTRACT

This thesis is a study of the needs of the City of Tempe, Arizona for the development of their proposed Civic Center. There are five major parts of this study. First, an analysis of the City's general problem of development which includes a description of the City, organization of the government, population projection, and scope of this study. Second, the site is studied from the general point of view of the climate and landscape material, to the specific site selection and traffic conditions around the site. The third part is a comprehensive study of spaces needed including; a description of the function, space allocation, and list of facilities. Fourth is a statement of the conclusion of the author about the data and of why he made the design choices that comprise the fifth part of this thesis.

I. STATEMENT OF THE PROBLEM

A. GENERAL

I selected the Tempe Municipal Center as a project for several reasons. First, Tempe is a city that is faced with a problem that is common to many small cities today. It is a city that is tangent to another large city and is surrounded by other smaller cities, all of which are growing and becoming more dense. This has the effect of taking a once clearly defined city and submerging it in a morass of growth that tends to make it an obscure entity. It will become less and less possible to clearly see or experience its extremities. For this reason, I believe we must develop clearly defined nodes or places in the city in order that its citizens can identify with it and establish a sense of ownership. I believe that a good deal of citizen apathy and consequent irresponsibility is due to the fact that no longer can they identify with their town other than in the sense that they live out in that general direction. In addition to the morass of houses that have been developed around the older city, they also are in danger of losing a sense of significance due to the growth of Arizona State University which is located in Tempe. I believe Tempe and cities like it need to give special care to the development of their civic center and other nodes, such as the main street, in order to overcome this problem. I have not tried

to propose a monument that will give importance to the center by simple punctuation, but rather try to develop a unique area that produces a vital piece of environment for functions of civic government as well as a place for the public function of the Tempe citizens. I have concentrated on the experience of the participant in this environment rather than the design of a beautiful object for tourists' entertainment.

B. DESCRIPTION OF CITY

In 1964, Tempe was a city of 43,445 undergoing a fantastically rapid growth. Most of this growth has taken form of a large increase in residential development rather than the development of an expanding business community. Its major economy is based on retail sales and the providing of services to a rapidly growing university and a large tourist trade. Its major attraction is its very pleasant climatic conditions through the winter months. Tempe Councilmen and businessmen are vitally interested in rejuvenating their business street, Mill Avenue, in order that they may better compete with the surrounding towns for the tourist trade, as well as attract a projected 30,000 student enrollment, plus faculty, that forms the university community, into their market place. They feel that this community center complex will play an important role in beginning this reconstruction.

C. POPULATION PROJECTION

Tempe, in 1964, exceeded a prediction of its population made by the College of Business Administration, Arizona State University, by 3,445 people. This projection predicts that Tempe will have 60,000 people in 1970 (see figure 1). Figure 2 demonstrates graphically what this means in actual physical growth from 1894 to 1964. The City predicts that by 1980 it will have a population of 80,000 people. This project has been designed for a population of 96,000 people. The City feels that their growth will level off at about this number. This total population does not include students and faculty who do not live in Tempe, which is a large part of the projected student enrollment. This optimism about growth is based primarily on the comparative ratio of growth in Arizona and the United States generally (see figure 3). Figure 4 shows the projected population growth of Arizona from 1945 to 1970.

D. ORGANIZATION OF GOVERNMENT

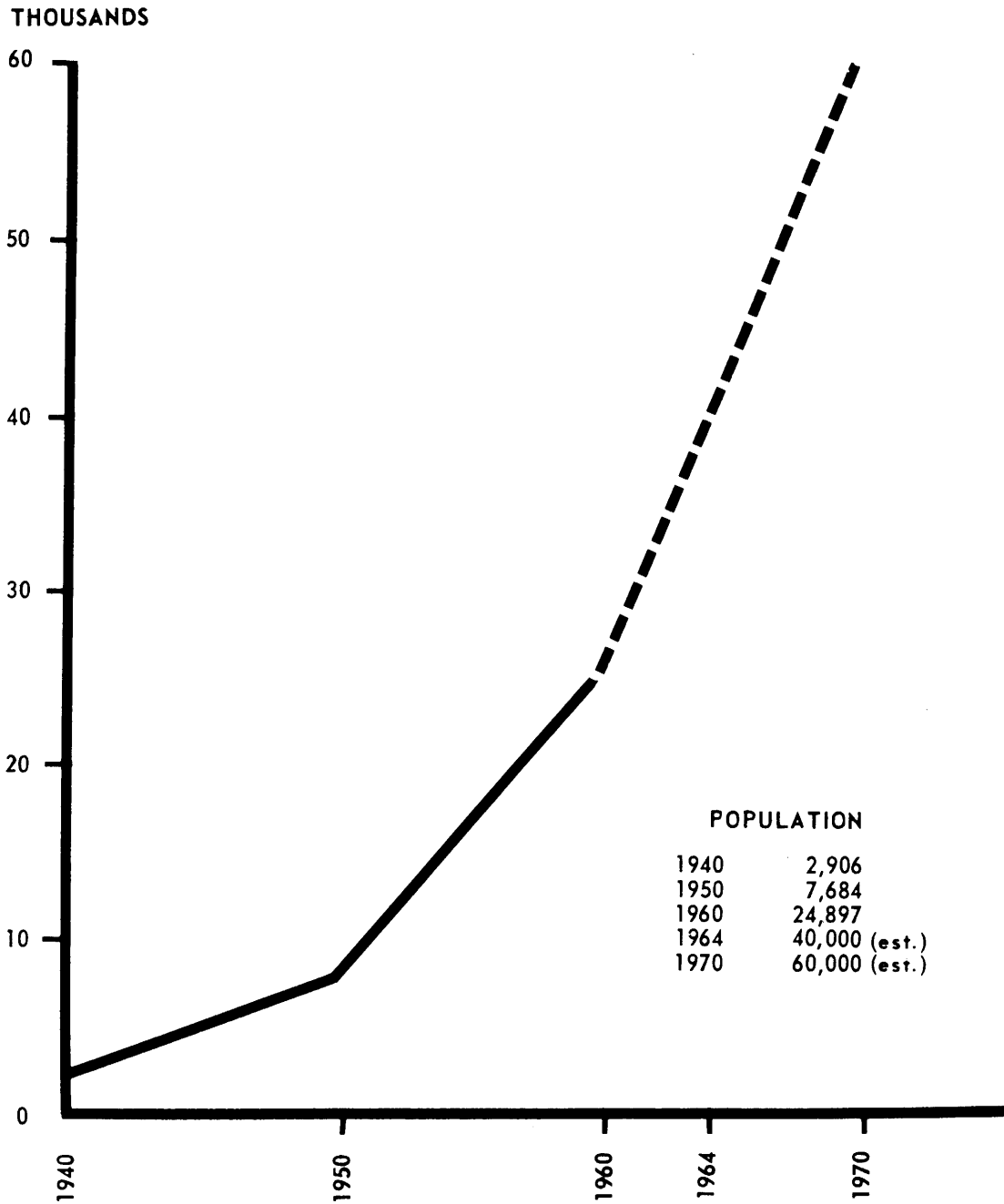
Tempe has a City Manager form of government. The Manager is responsible for the administration of the government, while the City Council and Mayor form the primary policy making body. (See figure 5 on the Organization of the Government)

E. SCOPE OF PROBLEM

This project will accommodate all of the functions of the municipal government with the exception of the Fire Department, i.e., Mayor and City Council, City Manager, Municipal Court, City Clerk, Finance, Personnel, Law, Planning, Building Inspection, Parks and Recreation, Public Works Administration, Public Works - Engineering, Public Works - Construction, Public Works - Property Service, Police. In addition, a public library facility, a little theater, post office, general lounge, and health office are part of this complex. I have added to the complex, space to accommodate exhibits both for the police station and the library, also, general exhibit space, commissary facility, cafeteria, and barber shop. In addition, I have provided office, as well as activity space, for such functions as 4H, Boy Scouts, Junior Achievement, Junior Chamber of Commerce, the Chamber of Commerce, and General Civic Club Spaces. I have not provided for a convention facility that the city is entertaining as part of this complex.

Fig. 1

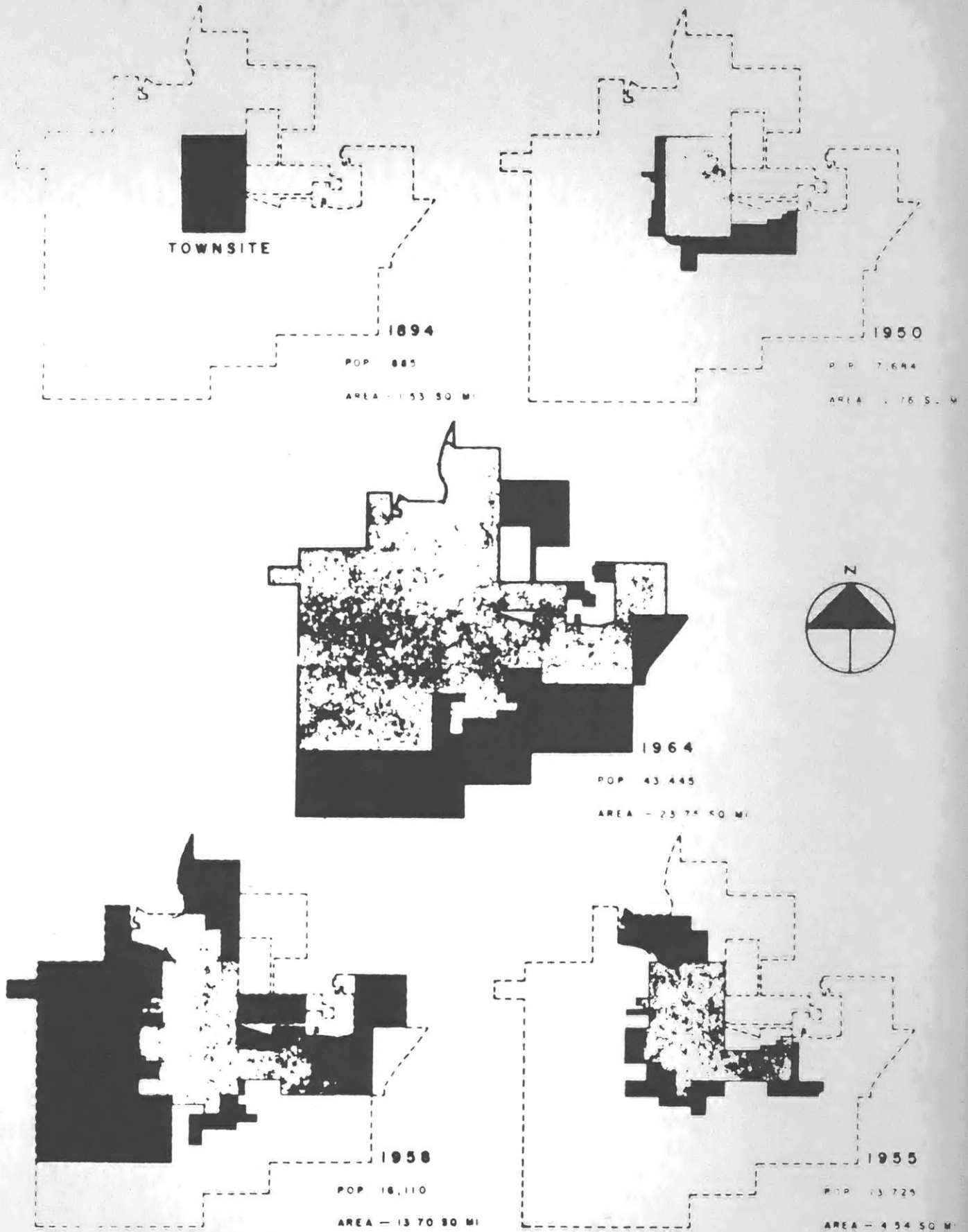
TEMPE, ARIZONA POPULATION CHART



Sources: U.S. Bureau of the Census, U.S. Census of Population: 1960, Number of Inhabitants, Arizona, Final Report PC (1)-4A (Washington: Government Printing Office, 1960), Table 8, p. 9.

1964 and 1970 Estimates, Bureau of Business Services, College of Business Administration, Arizona State University.

Fig. 2



TEMPE, ARIZONA
70 Years of Growth

Fig. 3

POPULATION — ARIZONA vs. UNITED STATES (Ratio Scale.)

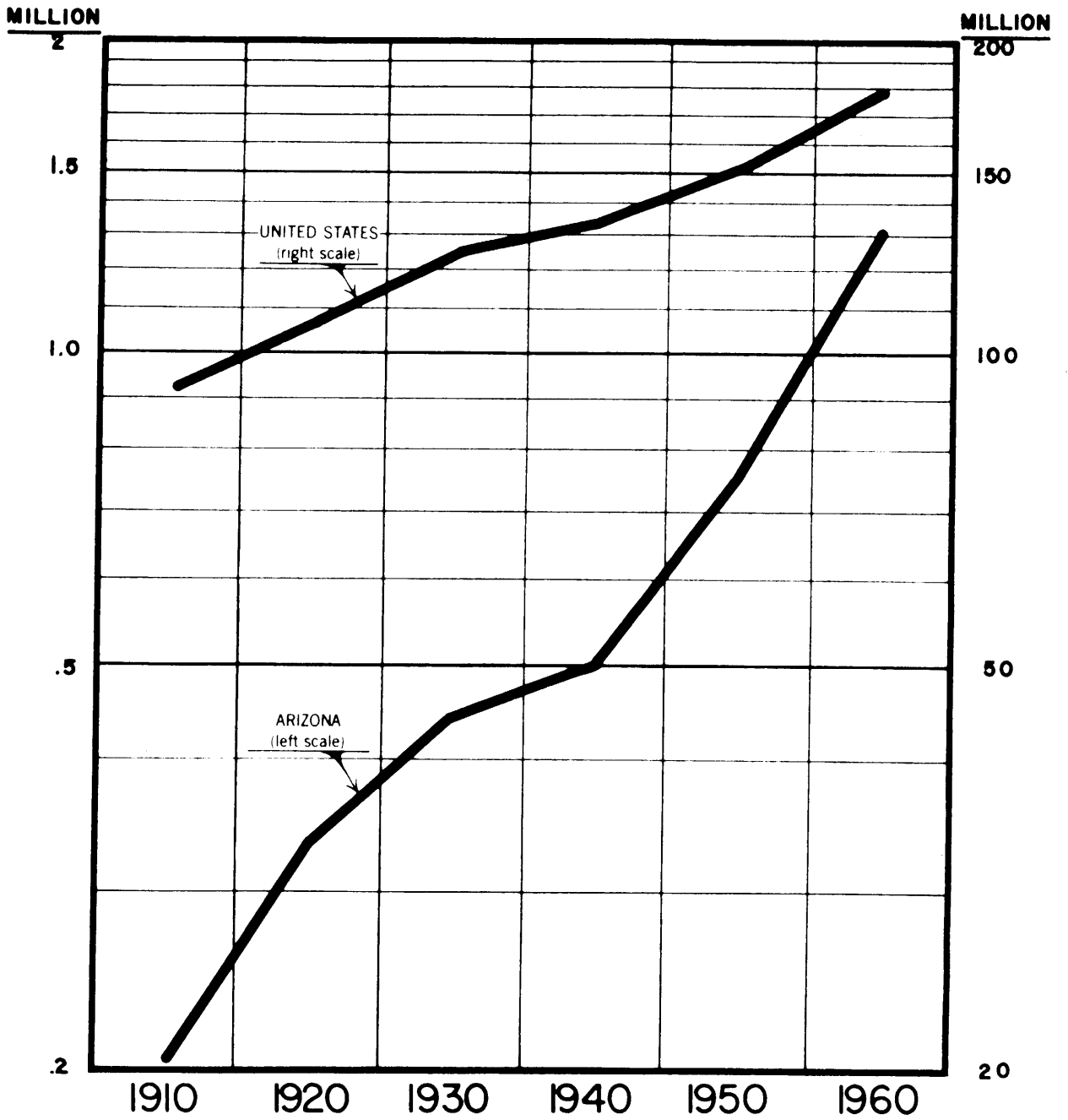
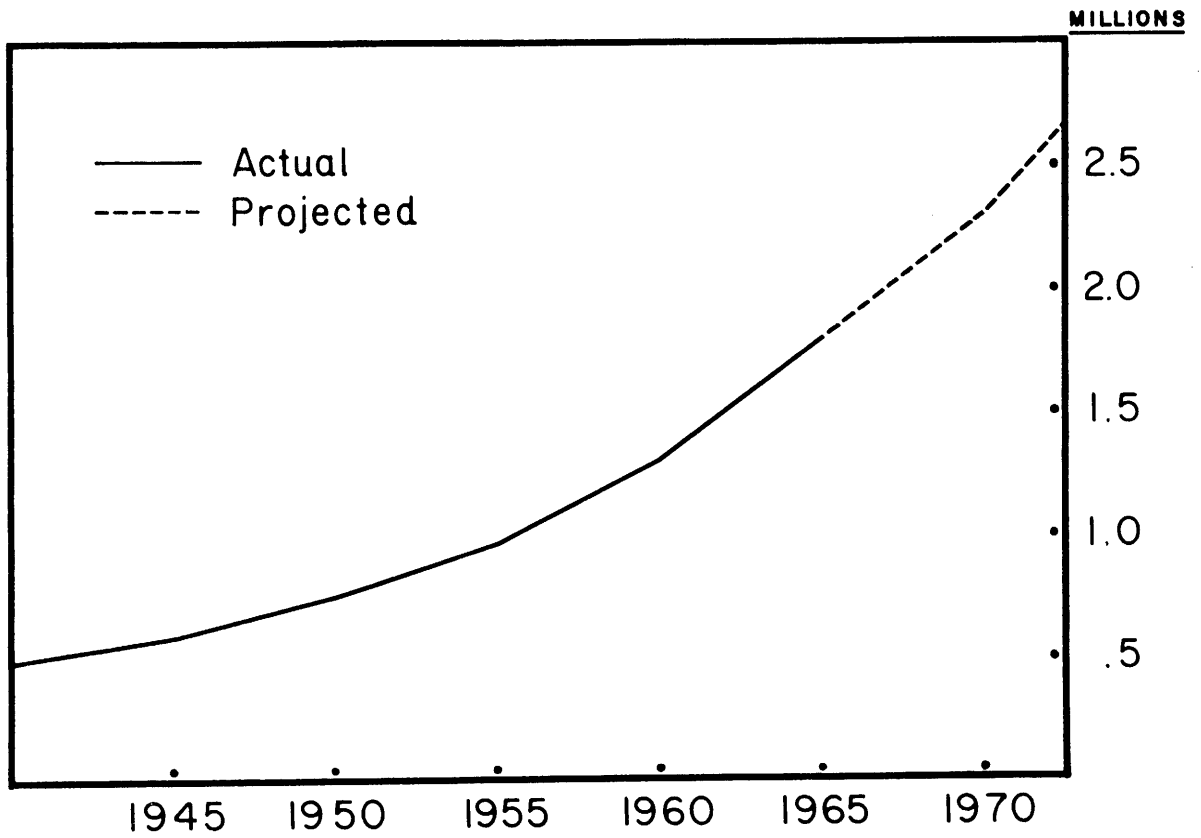
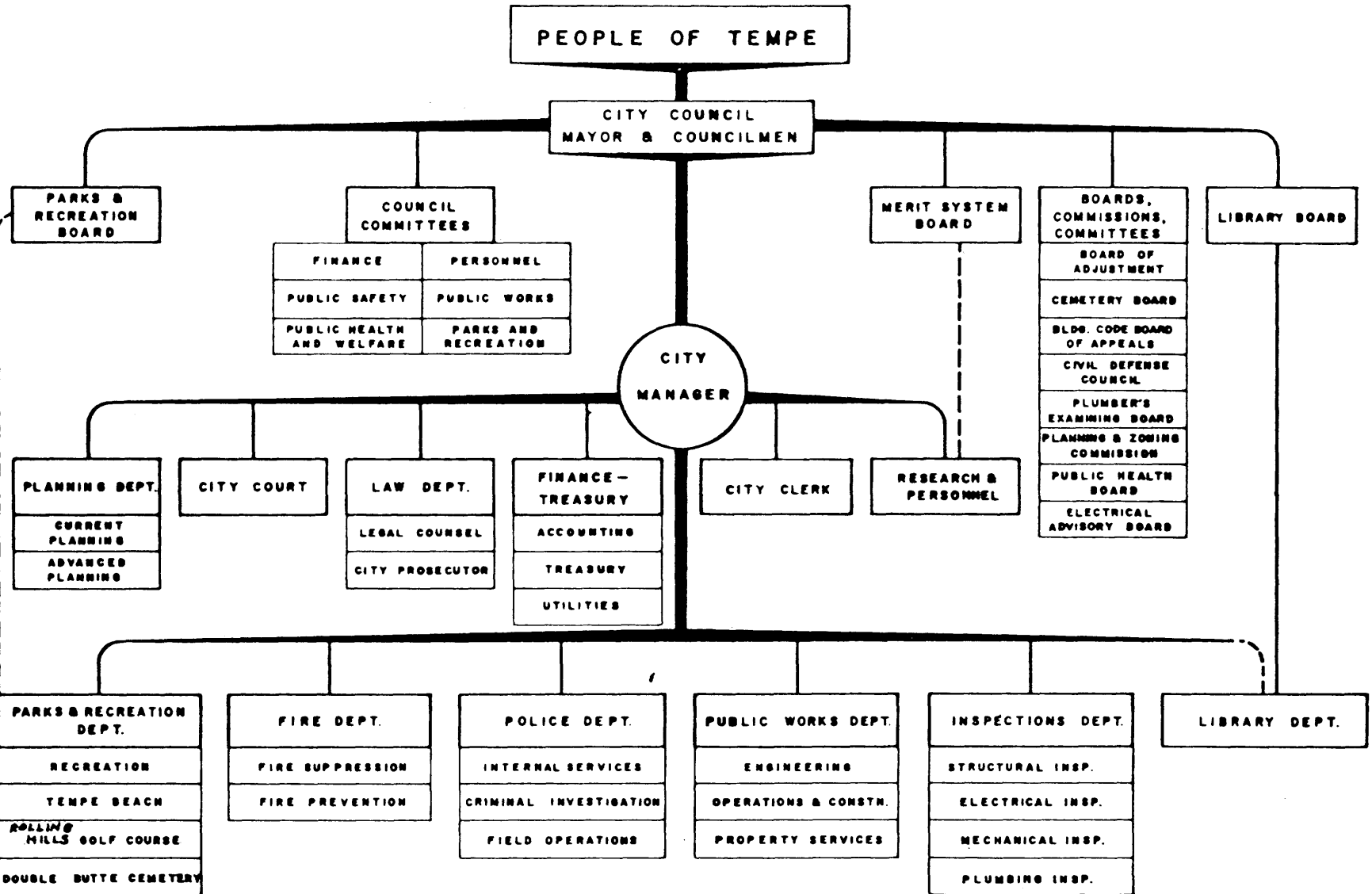


Fig. 4

ACTUAL AND PROJECTED POPULATION GROWTH IN ARIZONA —



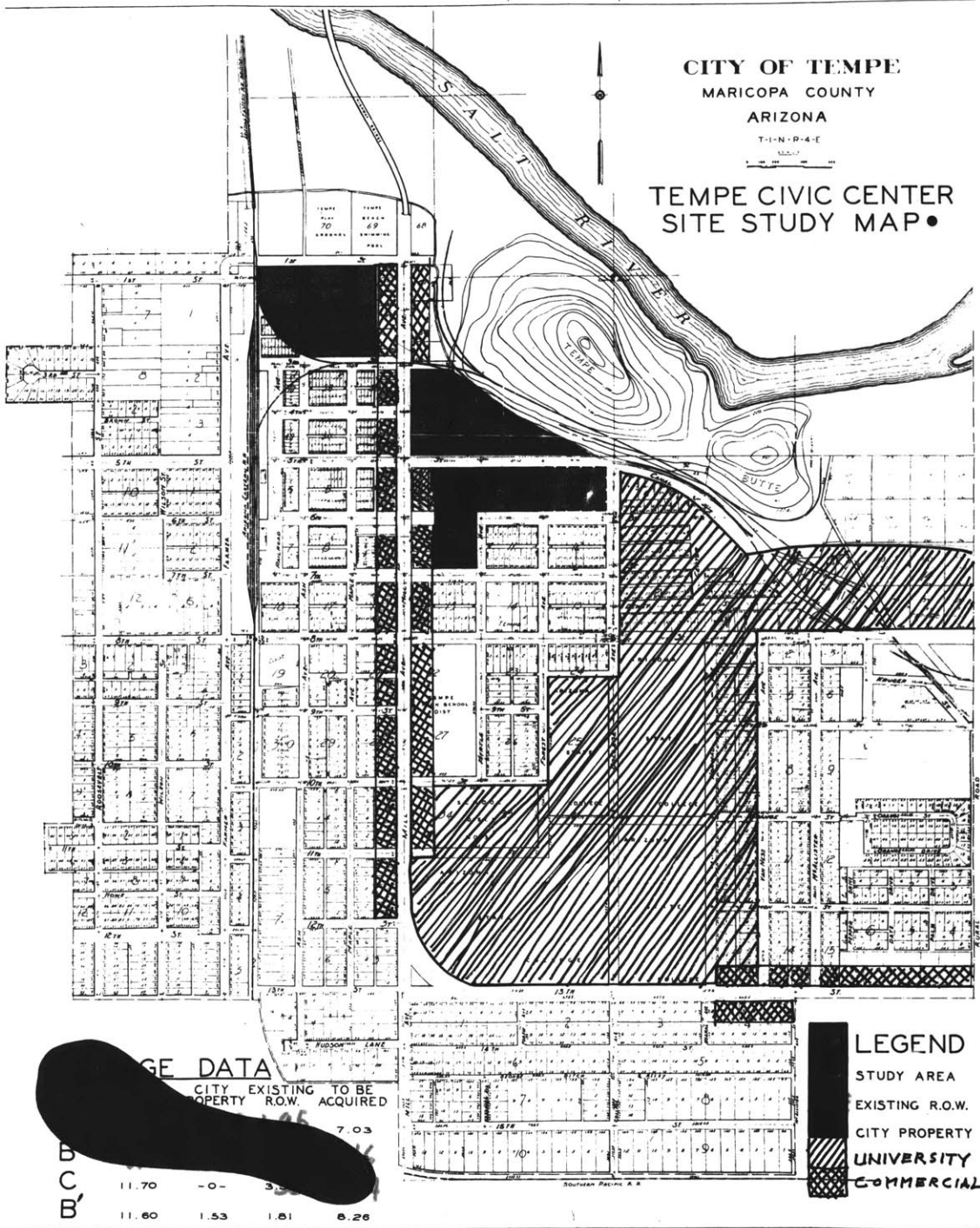


II. SITE ANALYSIS

A. SITE SELECTION

The City of Tempe has appointed a committee to investigate possible sites for their Center. They have proposed three alternative sites, A, B & B', and C (see figure 6). Site C is located by the existing Tempe recreation area. This site offers the possibility of integrating the complex with those recreation facilities. The existing City municipal building is on site B & B prime. B prime is that section that contains the present city library. This site does not offer the possibility of using older structure as part of the scheme. These structures are not capable of being rejuvenated to serve their needs. This site, however, has the advantage that it is mostly owned by the City (see figure 6). Neither site C nor B has a frontage on Mill Avenue, the main business street. However, B & B' does have frontage on Fifth Street which is an important link to the University (see figure 6). I have chosen site A because I believe it has advantages of considerable merit over the other two sites. First, it is bordered on the north and southeast by Tempe Butte which is the most prominent visual form of the City. I believe that the complex can draw strength from this Butte as a visual backdrop for its own development. Secondly, site A has a frontage on both Mill Avenue and Fifth Street. The intersection of these streets forms the boundries of the site on the south

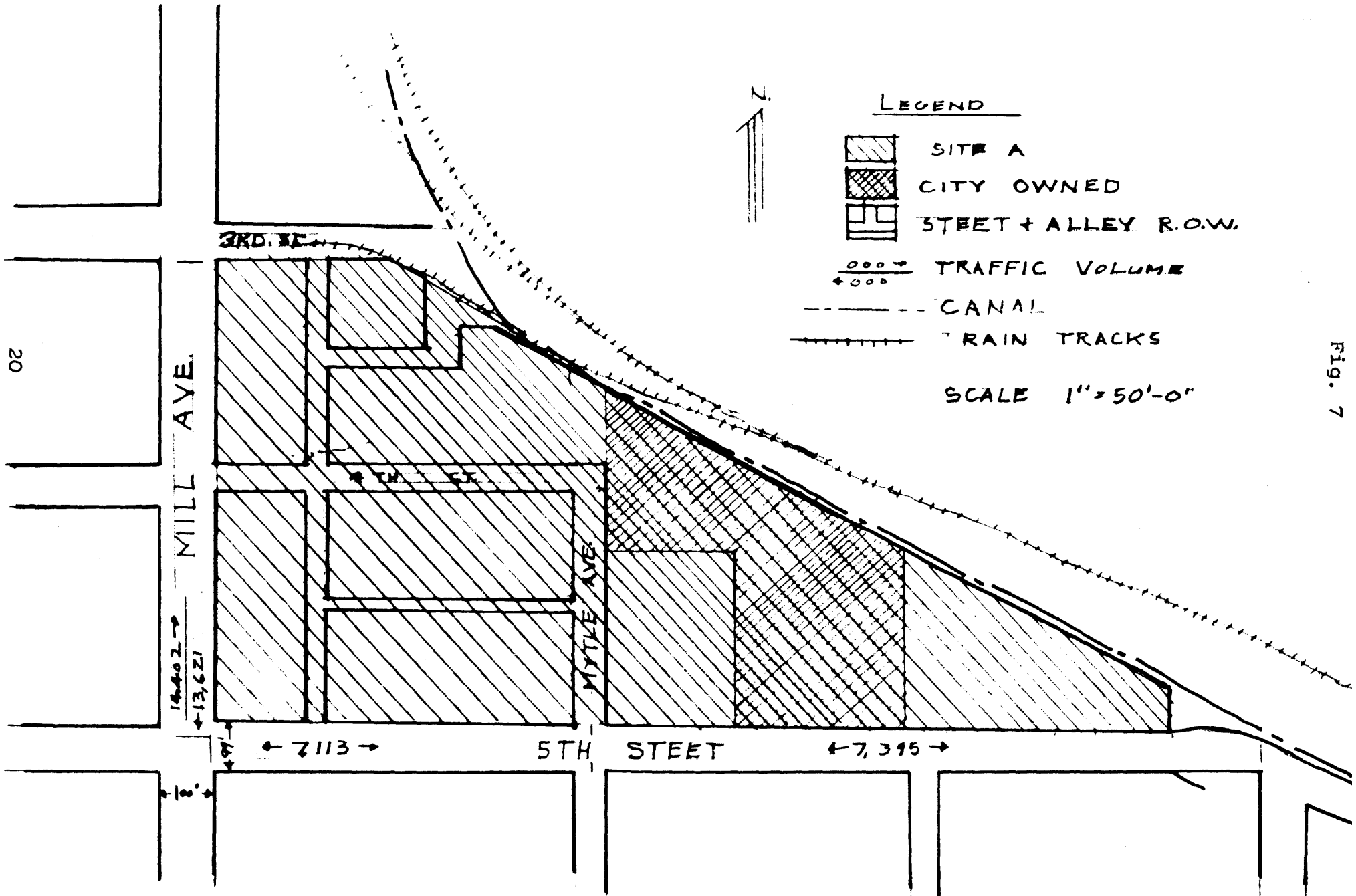
Fig. 6



and west. The complex is therefore in the presence of the major traffic flow in and out of the City. This also will help strengthen Mill Avenue and begin the rejuvenation of the business district. In addition, site A contains a large section of the Hayden Canal. This canal could provide irrigation for the site as well as be developed into an important part of the landscape development. Site A is also the location of the most depressed part of the older city, and its usage for the City provides an excellent opportunity to revitalize this area. Site A is partially owned by the City (see figure 7). In addition to the lots that the City owns, they have control over the streets and alleys and rights-of-way in this area which is a large percent of the site. Also, a large part of this site is not presently occupied by structures.

B. TRAFFIC ANALYSIS

Both Mill Avenue and Fifth Street are heavily traveled streets. Mill Avenue is the major connecting link to Phoenix and Mesa. It carries the traffic of Highway 60, 70, 80, 89, 93. Fifth Street is the major link to the campus, which has a large off-campus student body. Also, it is a link to Transmission Road, a major link to Mesa, and Scottsdale Road, a major link to Scottsdale (see figure 8). Mill is about 100 feet wide, and Fifth is 99 feet wide. Mill's average daily traffic in this section is 14,402 cars



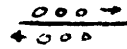
LEGEND



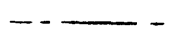
SITE A

CITY OWNED

STREET + ALLEY R.O.W.



TRAFFIC VOLUME



CANAL



TRAIN TRACKS

SCALE 1" = 50'-0"

Fig. 7

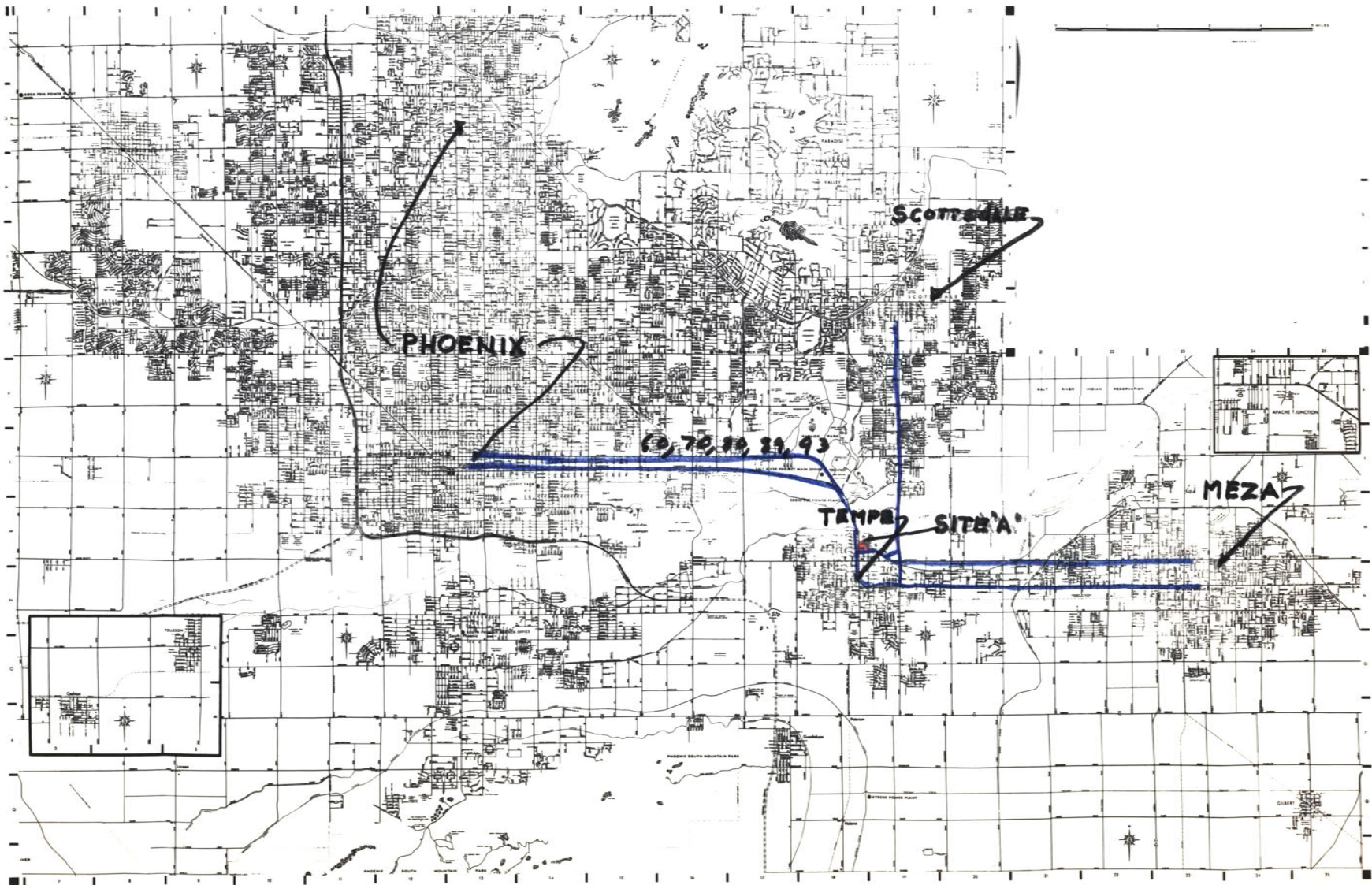


Fig. 8

going north and 13,621 cars going south (see figure 7). Fifth Street carries approximately 7,400 cars both ways. This site offers the possibility of bringing cars and services into the site both at Third Street and its most eastward boundry (see figure 7). This allows for an easy access to the public parking facilities and services.

C. CLIMATE

Arizona is divided into three distinct geographic areas-- a high northern plateau, central mountains, and a low southern desert. Each has its own typical flora and founa. Tempe is located in the desert region. This area is relatively low in elevation and dry, with hot summers and mild winters. Clear weather predominates, with most areas averaging 80 to 83 percent of the possible sunshine. Average rainfall in this desert area ranges from 3 to 10 inches a year (see figure 9). From the desert rise several substantial mountain ranges, and the broad river valleys lying between are irrigated. It is these valleys that contain 80 percent of the state's population. The irrigated areas produce exceptional yields in the fertile soil and have a long growing season.

1. Temperature

Temperature in Tempe is characterized by extreme heat intensity. The problem for the architect is to counter the heat that penetrates into the building.

There are several things that can be done to minimize penetration. First, careful consideration must be given to the time lag characteristics of different materials and types of screening walls, in that, different walls conduct heat through them at different rates. If the architect can design a wall that will slow down heat penetration during the heat of the day, then when the temperature change occurs, penetration will reverse itself and the main body of heat will never enter the interior spaces. The following are examples of time lags of various materials:

8" block wall	4 hours
8" brick wall	6 hours
16" stone wall	12 hours

A cavity wall has little value other than the material characteristic itself in alleviating the penetration problem unless the exterior side of the interior wall is covered by a reflective surface such as aluminum foil, or unless there is a movement of air through the cavity to prevent the heat from entering the interior wall.

Second, heat penetration depends on the angle at which heat rays strike a surface. The maximum heat is transferred when the rays strike a surface at a 90° angle. So, if one can minimize the area of any surface that will be at 90° to the sun at any time, heat penetration will be minimized. This problem can be handled by the creation of an infinite amount of small

surfaces on either exterior walls or roofs; such as rocks or rough textured wall materials. The use of battered walls and changing wall planes would also minimize that area that would be at 90° to the sun at any one time.

Third, the color of a surface will influence heat penetration. A light smooth surface reflects the most heat where a dark coarse surface absorbs the most heat.

Fourth, glass is a good conductor of heat, so a minimum of glass should be used on the walls that have the most exposure to the sun.

Fifth, a maximum of shadow cast on the building, especially over penetrated areas, will serve to cut down heat penetration. Shadow may be the result of overhangs, recessed glass, proximity to other exterior structures or the proper location of vegetation.

2. Sunshine

Sunshine in Tempe is characterized as being exceptionally bright and hot in the summer. The problem of sunlight is primarily one of shelter and glare, and exposure to the sunlight in Tempe is often a source of discomfort. Shelter from sunshine can be handled by properly orientating areas with respect to time of day, of maximum use, and angles of sun during those times of day. Glare poses a more serious problem in that

reflected glare off of exterior surfaces will serve to increase undesirable exposure. Rough textured surfaces such as mentioned when discussing heat penetration, on ground cover and adjacent buildings, in accordance with location of the sun, will eliminate the problem somewhat, both internally and externally (see figures 9 & 10).

3. Atmospheric Pressure

Atmospheric pressure, in itself, poses no particular architectural problem other than it determines the direction of wind, as stated previously.

4. Winds

Winds in Tempe are characterized by frequent wind and dust storms. Because of this, careful consideration must be given to the direction of the wind and the controlling of dust infiltration into the structure. All outside court areas must be oriented in such a way as to be protected from the winds. Careful detailing of doors and windows will help eliminate the dust problem (see figure 9).

5. Humidity

The relative humidity in Tempe varies from normal to abnormal conditions. From April to July the air is extremely dry, and it is because of this fact that the control of humidity is important, relevant to Tempe. This extremely dry air can be a source of discomfort for

the occupant if it is not controlled. Any type of air conditioning system to be used must be capable of controlling the humidity (see figure 9).

6. Cloudiness

The lack of cloudiness only serves to intensify the problems due to sunshine and temperature in the Tempe area.(see figure 9).

7. Precipitation

The amount of precipitation for any day, week, month or year, is very small for Tempe. Therefore, the control of moisture penetration is not critical. However, this fact allows for the use of materials, structural systems and details that would not otherwise be possible. For example, the control of water drainage for a roof is a small problem. Synthetic and organic materials may combine and few, if any, problems will arise due to moisture. Also, drainage from the under side of a concrete slab or retaining wall is not difficult (see figure 9).

D. GEOLOGICAL CONDITIONS

The soil in this valley, which is bordered by Camelback Mountain, Four Peaks Mountains, South Mountain, and the Superstition Mountains, is considered to be Valley Fill. It is a mixture of sand, gravel, and conglomerate. Since this valley was formed by the Salt River, the soil was distributed

Fig. 9

CLIMATE FOR TEMPE, ARIZONA

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
TEMP.	Min.	38	42	46	52	61	69	75	70	57	46	39
	Max.	63	68	74	81	91	101	101	98	87	75	68
% SUNSHINE	77.5	75.1	78.6	87.2	93.7	93.8	89.7	83.8	86.9	84.6	73.9	83.4
WIND	A.M.	E.	--	--	W.	--	--	S.E.	--	--	S.E.	--
	P.M.	W.	--	--	S.E.	--	--	W.	--	--	W.	--
HUMIDITY	34	33	28	18	14	15	24	29	28	29	35	42
MEAN PRECIP.	.8	.7	.7	.45	.2	.1	1.1	1.1	.8	.4	.6	.75

NOTE:

1. Atmospheric pressure in Tempe, Arizona is 14.11074# at an elevation of 1083 feet above sea level.
2. The percent of cloudiness is determined by subtracting the percent of sunshine, as shown in the above chart, from 100 percent.

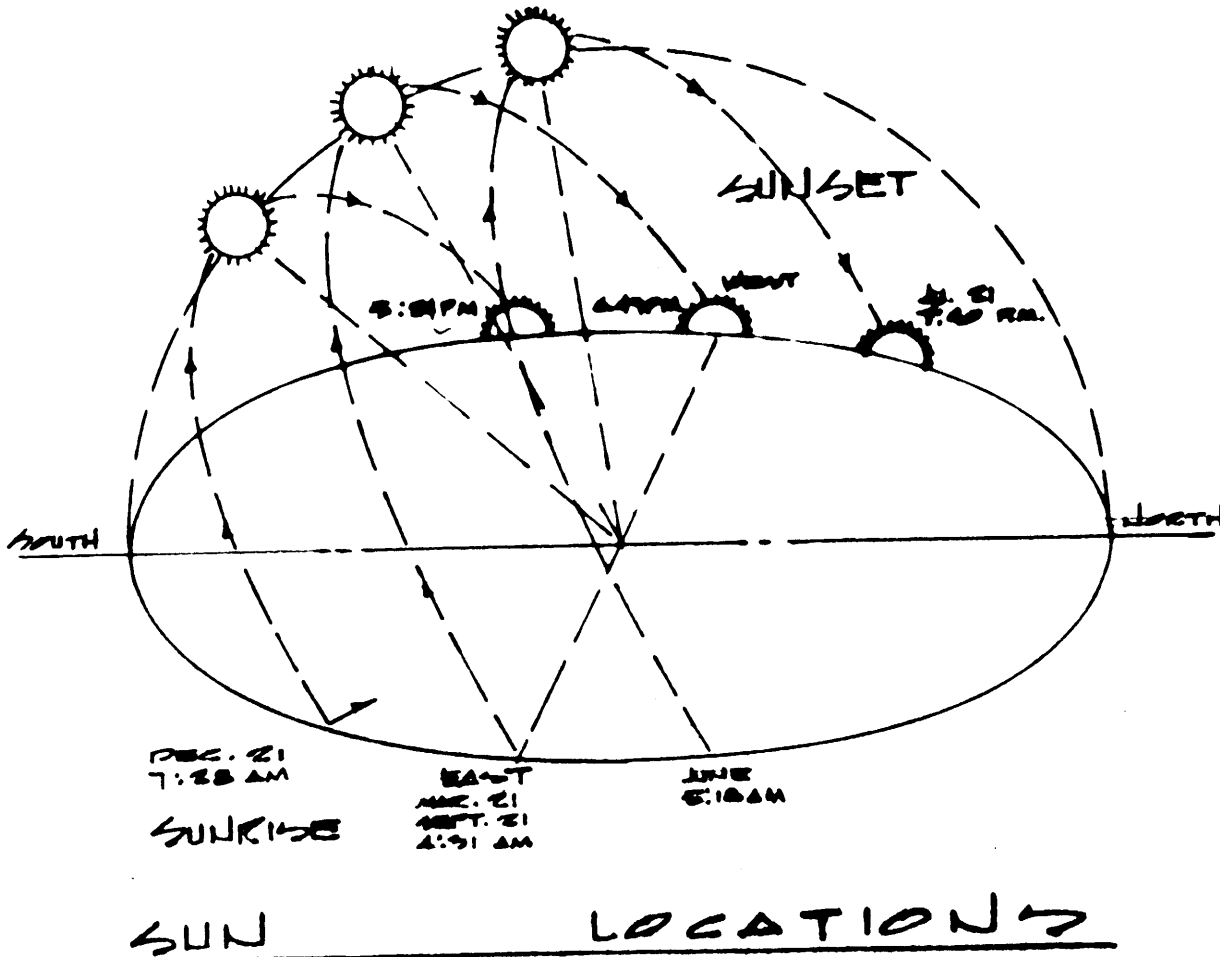


Fig. 10

<u>SUN ANGLES</u>			
Date	Time	Altitude	Azimuth
June 21	Sunrise	0 degrees	28 degrees north of east
	6:00 AM	12 "	21 " " " "
	7:00 AM	24 "	13 " " " "
	8:00 AM	37 "	7 " " " "
	9:00 AM	50 "	due east
	10:00 AM	63 "	10 degrees south of east
	11:00 AM	74 "	28 " " " "
	Noon	81 "	due south
	1:00 PM	74 "	28 degrees south of west
	2:00 PM	63 "	10 degrees " " "
	3:00 PM	50 "	due west
	4:00 PM	37 "	7 degrees north of west
	5:00 PM	24 "	13 " " " "
	6:00 PM	12 "	21 " " " "
	Sunset	0 "	28 " " " "
December 21	Sunrise	0 degrees	28 degrees south of east
	8:00 AM	10 "	36 " " " "
	9:00 AM	20 "	46 " " " "
	10:00 AM	28 "	59 " " " "
	11:00 AM	33 "	73 " " " "
	Noon	35 "	due south
	1:00 PM	33 "	73 degrees south of west
	2:00 PM	28 "	59 " " " "
	3:00 PM	20 "	46 " " " "
	4:00 PM	10 "	36 " " " "
	Sunset	0 "	28 " " " "

in the following layers starting at the top: sand and gravel, caliche and gravel, cobbles, boulders, and bedrock. Each of these layers runs from 6" to 15' depending on the location. Since the soil is very dry and dense and some caliche exists, some areas have extremely high bearing capacities. In all cases, however, soil tests of any particular site are necessary to determine actual soil bearing values.

E. LANDSCAPE MATERIALS

Since Tempe is an area under irrigation, almost any kind of plant will grow provided it is protected from the sun according to its resistance to sunlight. Also, plants must be protected from frost if necessary, but not from any sustained freezing.

The indigenous landscape material of the area is all desert plants such as the saguaro, prickly pear, ocotillo, cholla, and fish hook cactuses, palo verde tree, etc. In addition to these plants, many plants such as the date palm, fig, and citrus trees have been developed as part of the city landscape. In addition, the university campus has a wide range of plant development. Here is a list of some of those, categorized into tall, medium, and low plants:

Tall: Olive Tree
Carob Tree
Victorian Box Tree
Fan Palm Tree

Medium: Crape Myrtle
Brazilian Pepper
Latifolia
Bird of Paradise
Yew Pine
Loquat
Pyracantha
Peruvian Pepper

Low: Sago Palm
Bamboo Palm
Flax
Pampous grass
Blue Pescue
Tamarix Juniper
Heavenly Bamboo
Natal Plum
Evansii
Mock Orange

III. SPACIAL ANALYSIS

The projections of number of employees and space needs are based on a study made by the City of Tempe. This study is based on the projection of each department of their own needs. The study is summarized on figure 11. This data was then compared to similar requirements of other western cities (see figure 12). The study shows a rather significant increase in personnel which seems to be substantiated by a study made by the Employment Security Commission of Arizona (see figure 13). For functions other than the municipal government and police, the space requirement is an estimate made by the City. The parking requirement is based on what the City feels is a minimum site area to total floor area ratio of 2.5:1. Spacial requirements of functions such as cafeteria and exhibit and unassigned space which are not part of the City's program are estimates made by the designer. The listing of equipment is only an indication of some of the essential equipment of those departments. All floor area is given in square feet.

A. MUNICIPAL DEPARTMENT

1. Mayor and City Council

a. Description of Function

The Mayor is the presiding officer of the Council and is recognized as head of the City government for all ceremonial purposes and by the governor for purposes of military law and civil defense. Neither the Mayor nor any Council member has any administrative duties. Policy making and all other powers of the City are vested in the Council.

SUMMARY SHEET
EMPLOYEE AND SPACE DATA
TEMPE MUNICIPAL COMPLEX

Compiled by the City of Tempe Planning Department - October 1964

DEPARTMENT (DIVISION)	NO. OF EMPLOYEES		SPACE ALLOCATIONS** (SQ. FT.)		REMARKS
	EXISTING	PROJECTED*	EXISTING	PROJECTED	
GENERAL GOVERNMENT					
Council Chambers	--	--	792	2,510	
City Manager	4	8	552	1,875	
Personnel	0	4	0	630	
Lobby and Receptionist	1	3	326	2,200	
City Clerk	3	6	580	1,300	
Finance and Purchasing	22	45	1,887	6,583	
Legal Department	3	7	440	1,575	
Planning Department	3	7	525	1,650	
TOTAL GEN'L GOVERNMENT	<u>36</u>	<u>80</u>	<u>5,102</u>	<u>18,323</u>	
BUILDING INSPECTION	7	13	475	1,650	
MUNICIPAL COURT	3	7	980	4,050	
PARKS AND RECREATION	6	13	835	4,275	
POLICE	41	154	2,040	15,000	
PUBLIC WORKS					
Administration	3	8	450	1,500	
Engineering	10	22	550	3,380	
Construction	1	6	150	650	
Property Service	1	4	150	450	
TOTAL PUBLIC WORKS	<u>15</u>	<u>40</u>	<u>1,300</u>	<u>5,980</u>	
LITTLE THEATRE	--	--	0	18,000	This would be a multi-purpose facility, seating 500, for cultural presentations, public meetings, etc.
HEALTH OFFICE	--	--	0	500	This would be a City Health Service with a visiting nurse.
GRAND TOTAL	108	307	10,732	67,778	

*Figures based upon an estimated population of 96,000 persons by 1980.

**Figures do not include rest rooms, corridors, closets, mechanical equipment rooms, etc.

Tabulation of Data From
SUMMARY SHEET
MUNICIPAL COMPLEX SURVEY
Conducted by the City of Tempe Planning Department - October 1964

CITY	POPULATION		NO. OF EMPLOYEES	FLOOR AREA (SQ. FT.)	SITE AREA (ACRES)	OFF-STREET PARKING SPACES	
	CURRENT	PROJECTED*				VISITORS	STAFF
1 Albuquerque, N. M.	240,000	500,000	1,725	103,820	3.04	128	123
2 Alhambra, California	61,000	120,000	427	49,600	3.21	139m	31
3 Arlington Heights, Ill.	40,000	55,000	280	34,000	4.50	50	40
4 Barstow, California	14,500	25,000	102	27,000	24.00	54	38
5 Bellevue, Washington	18,000	30,000	126	17,250	8.00	87	34
6 Buena Park, California	63,000	88,000	241	15,598	12.28	134	NA
7 Clovis, New Mexico	27,000	70,000	189	12,000	1.00	NA	NA
8 Concord, California	62,000	90,000	434	12,200	1.25	40	28
9 Fillmore, California	5,475	7,500	38	3,850	1.75	NA	NA
10 Fullerton, California	70,000	130,000	493	46,274	3.75	25	95
11 Golden, Colorado	8,500	15,000	60	17,279	4.82	81	33
12 Hemet, California	8,000	20,000	56	13,924	2.00	39	—
13 Henderson, Nevada	18,100	35,000	127	13,000	2.50	32	58
14 La Mesa, California	32,800	50,000	230	12,120	1.50	32	25
15 Los Altos, California	23,300	NA	163	7,000	10.00	58	57
16 Los Altos Hills, Calif.	3,472	10,000	24	2,000	3.00	NA	NA
17 Mesquite, Texas	45,000	70,000	315	17,700	12.55	62	33
18 Mountlake Terrace, Wash.	13,143	20,000	92	17,800	19.52	40	20
19 Palm Springs, Calif.	18,520	NA	127	17,487	8.00	100	50
20 Paso Robles, California	7,000	15,000	49	6,250	2.50	NA	NA
21 Prescott, Arizona	15,000	30,000	105	19,000	1.00	41m	—
22 Redondo Beach, Calif.	54,000	NA	378	33,415	4.13	60	70
23 San Jose, California	320,000	400,000	2,240	154,000	30.00	50	600
24 Santa Paula, Calif.	15,050	20,000	105	12,050	1.60	33	12
25 Saratoga, California	18,550	40,000	130	7,500	7.00	100	20
26 Tacoma, Washington	151,300	250,000	1,059	358,368	8.73	251	258
27 Torrance, California	126,000	None	880	232,410	51.00	187	214
28 Tarlock, California	10,200	30,000	71	8,600	10.00	70	25
29 Westminster, Colorado	18,000	25,000	126	6,810	4.5	40	25
TEMPE, ARIZONA (existing)	44,000	—	300	10,732	1.66	32	50
TEMPE, ARIZONA (proposed)	—	96,000	670	67,778	—	—	—

*Estimate of population which could be served by existing facility without expansion.

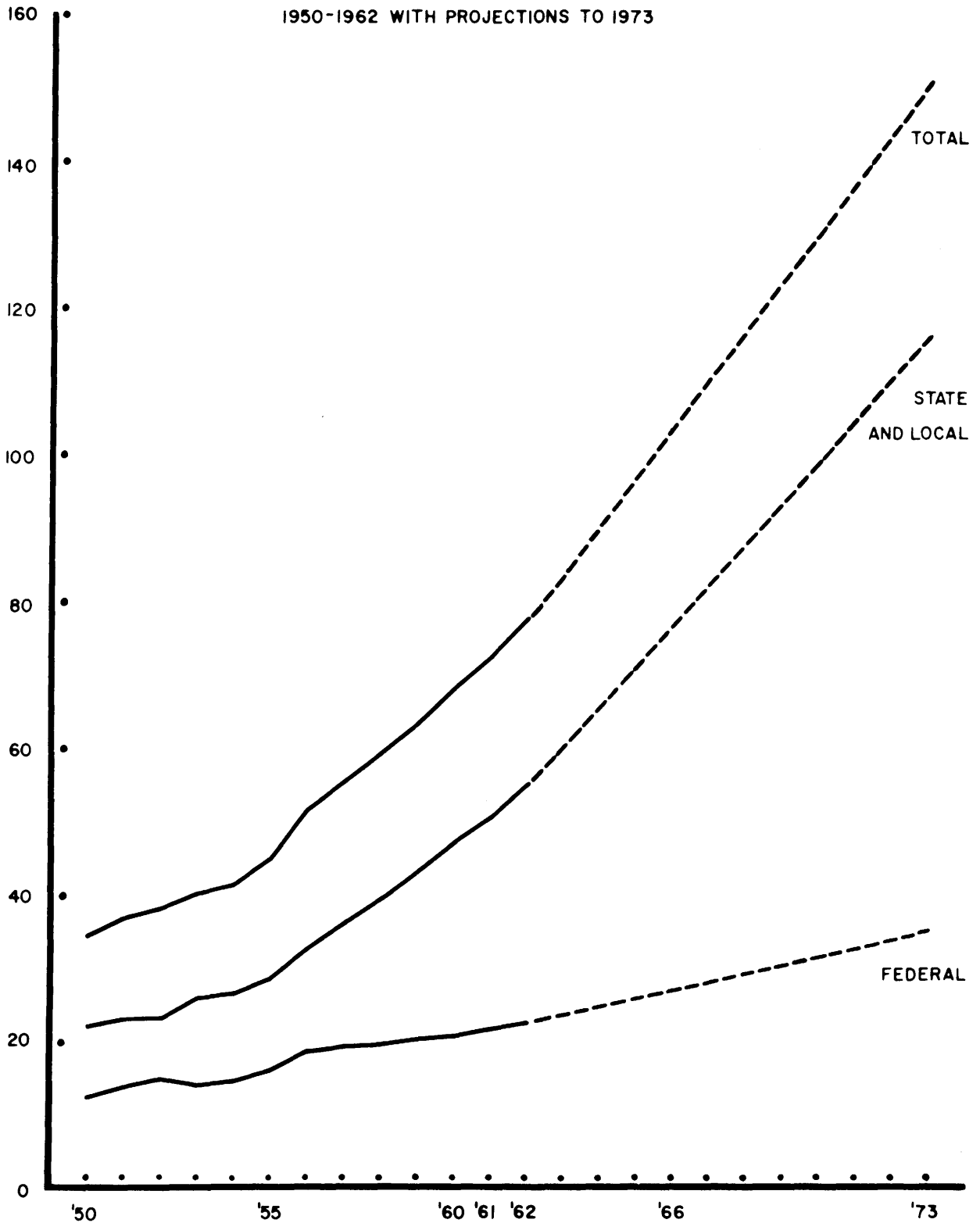
"m" indicates metered parking

Fig. 13

FEDERAL, STATE AND LOCAL GOVERNMENT EMPLOYMENT IN ARIZONA

THOUSANDS

1950-1962 WITH PROJECTIONS TO 1973



b. Personnel

- Mayor
- Council Members (6)
- Staff (5)
- Guests (150)

c. Spaces

- (1) Council Chamber- - - - - 2,010
 - Council seating - 260
 - Staff seating - - 150
 - Guest seating - 1,600

Equipment: Posting Board
 Blackboard
 Storage Cabinet
 Custom built Council raised platform & table combination plate glassed tops for 7 people in semi-circular pattern with on & off switches
 Dynamic Cardioid Microphones
 Name Plates (7)
 Arizona State Flag, pole & stand
 U.S. Flag, pole & stand
 MX6 Power Supply Units (2)
 Bogen Amplifier - 2 speakers
 Wall Clock
 Thermo-Fax Overhead Projector
 Picture Screen with Stand

- (2) Mayor's Office - - - - - 200

Equipment: 3 Drawer File Cabinet (legal)

- (3) Conference Room- - - - - 500
- (4) Foyer- - - - - 300
- (5) Public Toilets - - - - - 115

d. Total Space Requirement - - - - - 3,125 Sq. Ft.

2. City Manager

a. Description of Function

The City Manager's Office is responsible for the proper administration of the affairs of the City Government. This office must be continually aware of the activities, needs, and programs within the City Organization as well as related activities, needs and programs of the community and its environs.

- b. Personnel
 - City Manager
 - Assistant City Manager
 - Secretaries (2)
 - Administrative Assistant
 - Administrative Intern (2)
 - Clerk

- c. Spaces
 - (1) Manager's Office - - - - - 400
 - Equipment: Bookcase
 - Posting Board

 - (2) Assistant Manager's Office - - - - 200

 - (3) Manager's Secretary- - - - - 100
 - Equipment: 4 Drawer Files (7)
 - 6 Drawer Cardex

 - (4) Assistant Manager's Secretary- - - 100

 - (5) Administrative Assistant - - - - - 150
 - Equipment: 4 Drawer File (legal)

 - (6) Administrative Interns - - - - - 200

 - (7) Clerk- - - - - 100

 - (8) Conference Room- - - - - 625

 - d. Total Space Requirement- - - - - 1,875 Sq. Ft.

3. Municipal Court

- a. Description of Function

Responsible for the administration, establishment and control of all Municipal Court functions. Included is adjudication and deposition of all misdemeanor charges originating within the City limits of Tempe.

- b. Personnel
 - Magistrate
 - Clerk-Steno
 - Steno (2)
 - Secretary
 - Clerk
 - Prosecuting Attorney

c. Spaces

(1) Courtroom- - - - - 1,500

Equipment: Blackboard (wall)
American Flag
Arizona State Flag
Wall Clock

(2) Prosecutor - - - - - 200

(3) Fines Clerk- - - - - 350

Equipment: Legal Size Files
Adding Machine

(4) Judge's Chambers - - - - - 250

(5) Stenographer - - - - - 200

(6) Clerk- - - - - 200

(7) Stenographer - - - - - 200

(8) Foyer- - - - - 150

(9) Jury Room- - - - - 400

(10) Conference Room - - - - - 300

(11) Interview Room- - - - - 300

d. Total Space Requirement- - - - - 4,050 Sq. Ft.

4. City Clerk

a. Description of Function

The City Clerk's primary duty is that of secretary to the City Council. Also, the City Clerk is the official recordkeeper of City documents.

b. Personnel

City Clerk
Assistant City Clerk
Secretary
Clerk/Steno
Clerks (2)

c. Spaces

(1) Foyer/Reception- - - - - 400

- (2) City Clerk - - - - - 200
- (3) Assistant City Clerk - - - - - 150
- (4) Clerks - - - - - 200
- (5) File Room, etc.- - - - - 300

Equipment: Cabinets to line walls above file cabinets; these are to house volumes of minutes, ordinances, supplies, etc.

- (6) Walk-in Vault- - - - - 50

Equipment: File Cabinets to house election files, formal bids, etc.

- d. Total Space Requirement- - - - - 1,300 SQ.FT.

5. Finance Department

a. Description of Function

The Finance Department is responsible for the accounting, billing, collection of revenue, and expenditures of the City pertaining to utilities, improvement assessments, permits, licenses and taxes.

b. Personnel

Finance Director
 Administrative Intern
 Clerk-Steno (2)
 Clerks (10)
 Accounting Clerks (6)
 Clerk Typists (12)
 Custodial Service Representatives (2)
 Meter Readers (8)
 Purchasing Agent
 Assistant Purchasing Agent
 Auditor

c. Spaces

- (1) Lobby, PBX - Control System Area - 196
- (2) Billing Clerks - - - - - 550
- (3) Duplicating & Office Supplies- - - 340

(4) Machine Accounting - - - - - 2,100
(Humidified & Soundproofed)

Equipment: Printing Calculator (2)
Electric Adders (4)
Bookkeeping Machines (2)
Posting Machine
Addressograph Machines (2)
Feeder Frame for Addressograph
70 Drawer file cabinet for
Addressograph plates
4 Drawer File
Files on Wheels (3)
Mail Opener
Stamp Machine
Metal Table on Rollers
Wall Clock
Sectional Files
Protectograph Signer
Counter, Knee Hole Type
(30" x 80" x 42")
Counter, Open type pigeon hole
(30" x 160" x 42")
Master Safe on Wheels
4 Drawer Files (legal) (2)
Cashier Counter, solid front,
raised top in middle (11' x 36")

(5) Clerk, Assistant & Auditor - - - - - 250

(6) Cashiers & Lobby - - - - - 592

Equipment: Counters - 50 lineal feet

(7) Accounting - - - - - 480

(8) Steno- - - - - 200
Equipment: Files

(9) Finance Director's Office - - - - - 200

Equipment: Bookcase
4 Drawer Files (2)

(10) Safe, Walk-In (Humidified) - - - 200

(11) Archives & Storage (Humidified)- 675

(12) Microfilming (Humidified) - - - - 300

(13) Conference & Meter Readers- - - - 500

d. Total Space Requirement- - - - - 6,583

6. Personnel

a. Description of Function

Responsible for interviewing prospective personnel and keeping personnel records.

b. Personnel

Personnel Officer
Assistant
Secretary
Clerk

c. Spaces

(1) Personnel Officer- - - - - 200

(2) Assistant- - - - - 150

(3) Secretary, Clerk, and Interview
Cubicles- - - - - 280

d. Total Space Requirement- - - - - 630 Sq. Ft.

7. Law Department

a. Description of Function

The City Attorney is a full-time appointed official whose primary functions are to advise the City Council and the Administrative Staff on legal matters; to represent the City of Tempe in all court actions; to review proposed ordinances, contracts, etc. from the standpoint of legality; to draft all legal documents and to perform such other legal duties as may be required.

b. Personnel

City Attorney
Assistant City Attorney (3)
Secretaries (2)
Clerk-Receptionist

c. Spaces

(1) City Attorney- - - - - 225

Equipment: Calculator
Built-in Credenze

- (2) Assistant City Attorney- - - - - 600
 Equipment: Built-in Credenzas
- (3) Secretaries- - - - - 200
 Equipment: Filing Cabinets
- (4) Reception and Foyer- - - - - 300
- (5) Law Library and Conference - - - - 255
- d. Total Space Requirement- - - - - 1,575 Sq. Ft.

8. Building Inspection

a. Description of Function

The Building Inspection Department functions principally for the purpose of regulating efficiently all building construction within the municipality in the interest of public safety, health, property and welfare through the administration of the Municipal Building Code, Electrical Code, Plumbing Code, and Zoning Ordinance.

b. Personnel

Director
 Building Inspectors (6)
 Plans Examiner (2)
 Clerk-Stenographer
 Clerk-Typist (3)

c. Spaces

- (1) Director - - - - - 200

Equipment: 4 Drawer File
 Plan Hold Files
 Book Shelves (3)

- (2) Inspectors - - - - - 600

- (3) Plan Examiners -- - - - 250

- (4) Clerk-Stenographer - - - - - 100

Equipment: Counter (30" x 120")
 Adding Machines (2)
 Tray on Wheels
 Bulletin Board for Zoning maps

(5) Public and Clerical- - - - - 500

d. Total Space Requirement- - - - - 1,650 Sq. Ft.

9. Planning Department

a. Description of Function

The Planning Department administers the Zoning Ordinance and Subdivision Ordinance, assists the Planning Commission and Board of Adjustment, and prepares reports and planning presentations for the City Manager and other Department Heads.

b. Personnel

Director
Planner
Planning Analyst
Planning Aides (2)
Secretary-Receptionist
Clerk-Steno

c. Spaces

(1) Director - - - - - 200

(2) Planner- - - - - 150

(3) Drafting - - - - - 300

Equipment: Drafting Table

(4) Analyst - - - - - 100

(5) Clerical and Public- - - - - 400

(6) Files- - - - - 200

d. Total Space Requirement- - - - - 1,650 Sq. Ft.

10. Parks and Recreation

a. Description of Function

Operates Tempe Beach Swimming Pool, golf course, cemetery and parks. Offers arts and crafts programs, particularly for senior citizens and children, cultural program for children and adults, etc.

- b. Personnel
 - Director
 - Assistant Director
 - Clerk-Steno
 - Clerk-Typist (3)
 - Recreation Supervisor (3)
 - Recreation Specialist
 - Aquatic Supervisor
 - Maintenance Supervisor
 - Landscape Architect

- c. Spaces
 - (1) Director's Office- - - - - 250
 - (2) Assistant Director - - - - - 150
 - (3) Clerk-Steno- - - - - 125
 - (4) Recreation Supervisor and
Specialist - - - - - 300
 - (5) Clerk-Typists- - - - - 500
 - (6) Recreation Supervisors and Aquatic
Supervisors- - - - - 225
 - (7) Maintenance Supervisor - - - - - 125
 - (8) Landscape Architect- - - - - 150
 - (9) Conference Room- - - - - 600
 - (10) Crafts Area - - - - - 1,500
 - (11) Storage Room- - - - - 350

- d. Total Space Requirement- - - - - 4,275 Sq. Ft.

11. Public Works Administration

- a. Description of Function
 The Public Works Department is responsible for providing such services as construction and maintenance of water and sewer lines, maintenance of sewerage treatment plant, street maintenance, irrigation, refuse collection, maintenance of all City properties including parks, vehicles, and buildings and grounds. It also has the responsibility of checking and inspecting all installations and facilities on City property and within street

rights-of-way so that they meet with the numerous City requirements.

b. Personnel

Director
Assistant
Administrative Assistant
Secretary (2)
Clerks (3)

c. Spaces

(1) Director's Office- - - - - 200

Equipment: Bookshelf

(2) Assistant- - - - - 150

(3) Administrative Assistant - - - - - 150

(4) Secretaries- - - - - 200

Equipment: Files, legal & letter size

(5) Clerks - - - - - 300

(6) Conference Room- - - - - 300

d. Total Space Requirement- - - - - 1,500 Sq. Ft.

12. Public Works - Engineering

a. Description of Function

The Engineering Office is responsible for the checking of final plans and the inspection of all new subdivisions, and in some instances initial planning and design for all types of construction performed within City of Tempe rights-of-way, such as streets, sewers, water lines and off-site improvements for commercial developments.

b. Personnel

City Engineer
Assistant City Engineer
Civil Engineer (3)
Engineer Aides (9)
File - Engineer Aide
Blueprint - Engineer Aide
Lab - Engineer Aide
Field Crews - Engineer Aides (3)
Small Office - Engineer Aides (2)

- c. Spaces
 - (1) City Engineer- - - - - 200
 - (2) Assistant City Engineer- - - - - 150
 - (3) Civil Engineers- - - - - 450
 - (4) Office Engineer Aides- - - - - 1,000
 - (5) File Engineer Aides- - - - - 130
 - (6) Blueprint Engineer Aide- - - - - 150
 - (7) Lab Engineer Aide - - - - - 200
 - (8) Field Crews- - - - - 100
- d. Total Space Requirement- - - - - 3,380 Sq. Ft.

13. Public Works - Construction

- a. Personnel
 - Superintendent
 - Supervisors (4)
 - Secretary
- b. Spaces
 - (1) Superintendent - - - - - 150
 - (2) Supervisors- - - - - 400
 - (3) Secretary- - - - - 100
- d. Total Space Requirement- - - - - 650 Sq. Ft.

14. Public Works - Property Service

- a. Description of Function

Responsible for maintenance and janitorial services of the buildings within the City, and for the care of more than 60 acres of parks and grounds throughout the City. All vehicular primary maintenance for every department within the City organization is handled by this section.
- b. Personnel
 - Superintendent
 - Supervisors (2)
 - Secretary

- c. Spaces
 - (1) Superintendent - - - - - 150
 - (2) Supervisors- - - - - 200
 - (3) Secretary- - - - - 100
- d. Total Space Requirement- - - - - 450 Sq. Ft.

15. Police

a. Description of Function

The prime functions of the Police Department are the preservation of the public peace and order, the prevention and detection of crime, the apprehension of offenders, the protection of persons and property, and the enforcement of the laws of the State and the ordinances of the City.

b. Personnel

- Chief
- Captains (3)
- Lieutenants (4)
- Sergeants (14)
- Dispatchers (6)
- Clerks (10)
- Patrolmen (100)
- I.D. (4)
- Detectives (12)

c. Spaces

- (1) Chief's Office - - - - - 200

Equipment: Radio Monitor Receiver
Tape Recorder

- (2) Captains' Office - - - - - 450

Equipment: Files

- (3) Lieutenants' Office- - - - - 240

Equipment: Files (3)

- (4) Detectives Office- - - - - 400

Equipment: File Cabinet
Cabinet with Shelves

- (5) Interrogation and Viewing- - - - - 200

(6) Sergeants' Office-	200
Equipment: Storage Cabinet	
(7) Squad Room	750
(8) Records-	900
(9) Stenos	240
(10) Dispatcher-	120
(11) Evidence Room, Vault, Laboratory and I.D.	500
(12) Waiting Room-	700
(13) Classroom	750
(14) Additional Offices-	750
(15) Storage	200
(16) Show-Up	300
(17) Locker Room	1,500
(18) Gymnasium	4,000
(19) Cells	3,000
(20) Kitchen	200
(21) Miscellaneous	900
(22) Public Toilets-	336
(23) Staff Toilets	532
d. <u>Total Space Requirement-</u>	<u>-17,368</u>

B. OTHER FUNCTIONS

1. Central Library

a. Description of Function

The Library's primary responsibility is to provide reading material to the public. In addition, it will provide assistance in the use of the Library to adults as well as provide early library training for small children. It is responsible

for gathering and maintenance of library materials.

b. Personnel

Library Director
Librarian (5)
Librarian - Part time (2)
Clerk Typist (2)
Library Aid (2)
Page (2)

c. Equipment

Dictionary Stand
Magazine Rack
Book Stacks
Globe
Clocks
Auto-Page Book Depository
Card Catalogs
Book Truck
Filing Cabinets
Bulletin Board
Water Cooler
Adding Machine

d. Total Space Requirement - - - - - 50,000 Sq. Ft.

2. Little Theater

a. Description of Function

This theater would provide a multipurpose facility seating 500 people for cultural presentations, public meetings, etc.

b. Spaces

Lobby
Seating Area
Stage Area and scenery loft
Scenery shop back stage
Public Toilets

c. Total Space Allocation- - - - - 18,000 Sq. Ft.

3. Post Office

a. Description of Function

This is a Federal facility to provide post office business to the City. It requires good service and parking and loading space of approximately 30,000 Sq. Ft.

b. Total Space Allocation - - - - - 16,400 Sq. Ft.

3. Unassigned Space

a. Description of Function

This space is to be adjusted to the varying uses of different civic functions.

b. Typical Functions

Chamber of Commerce
Junior Chamber of Commerce
Veteran Groups
Service Groups
Professional Groups
General Civic Club Function
4H
Boy Scouts
Girl Scouts
Junior Achievement

c. Total Space Requirement- - - - - 2,000 Sq. Ft.

4. Health Office

a. Description of Function

Supervision of the general health problems of the community.

b. Total Space Requirement- - - - - 500 Sq. Ft.

C. COMMON USAGE

1. Lobby and Reception

a. Description of Function

This is the main lobby for the whole complex. It will provide information about the complex and city services to the public.

b. Personnel

Receptionist
Switchboard Operator
Communications Clerk

c. Spaces

(1) Lobby- - - - - 2,000
(2) Reception- - - - - 100
(3) Switchboard- - - - - 100

d. Total Space Requirement- - - - - 2,200 Sq. Ft.

2. General Lounge and Rest Rooms

a. Description of Function

This is a common facility for all staff members of the complex. It is a place for relaxation and social conversation.

b. Spaces

(1) Lounge - - - - - 3,250

(2) Rest Rooms - - - - - 750

c. Total Space Requirement- - - - - 4,000 Sq. Ft.

3. Cafeteria

a. Description of Function

Dining area for staff in the complex.

b. Spaces

(1) Dining - - - - - 1,500

(2) Kitchen - - - - - 1,100

c. Total Space Requirement- - - - - 2,600 Sq. Ft.

4. Staff Rest Rooms

a. There are two rest room/lounge areas integrated with the municipal administrative areas and unassigned space areas.

b. Total Space Requirement- - - - - 500 Sq. Ft.

5. Exhibition Space

a. Description of Function

Public exhibits for the enjoyment and instruction of the citizens.

b. Areas

Library
Police
General

c. Total Space Requirement- - - - - 3,000 Sq. Ft.

- 6. Circulation- 14,956 Sq. Ft.
- 7. Mechanical Equipment - - - - - - - - - - - - - - - - 19,742 Sq. Ft.
- 8. Parking
 - a. Municipal Parking
 - (1) Post Office- Approx. 30,000 Sq. Ft.
 - (2) Police - Approx. 60,000 Sq. Ft.
 - (3) Public Works - Approx. 30,000 Sq. Ft.
 - (4) Staff- Approx. 201,000 Sq. Ft.
 - b. Public Parking - Approx. 80,000 Sq. Ft.
 - c. Total Space Requirement- Approx. 401,000 Sq. Ft.

D. TABULATION OF SPACIAL REQUIREMENTS

- 1. City Council and Mayor - - - - - - - - - - - - - - - - - 3,125 Sq. Ft.
- 2. City Manager - 1,875 Sq. Ft.
- 3. Municipal Court- 4,050 Sq. Ft.
- 4. City Clerk - 1,300 Sq. Ft.
- 5. Finance Department - 6,583 Sq. Ft.
- 6. Personnel- 630 Sq. Ft.
- 7. Law Department - 1,575 Sq. Ft.
- 8. Building Inspection- 1,650 Sq. Ft.
- 9. Planning Department- 1,650 Sq. Ft.
- 10. Parks and Recreation - - - - - - - - - - - - - - - - - - - 4,275 Sq. Ft.
- 11. Public Works - Administration- - - - - - - - - - - - - - 1,500 Sq. Ft.
- 12. Public Works - Engineering - - - - - - - - - - - - - - 3,360 Sq. Ft.
- 13. Public Works - Construction- - - - - - - - - - - - - - 650 Sq. Ft.
- 14. Public Works - Property Service- - - - - - - - - - - - - 450 Sq. Ft.

15.	Police - - - - -	17,368 Sq. Ft.
16.	Central Library-- - - - -	50,000 Sq. Ft.
17.	Little Theater - - - - -	18,000 Sq. Ft.
18.	Post Office- - - - -	16,400 Sq. Ft.
19.	Unassigned Space - - - - -	2,000 Sq. Ft.
20.	Health Office- - - - -	500 Sq. Ft.
21.	Lobby and Reception- - - - -	2,200 Sq. Ft.
22.	General Lounge and Rest Rooms- - - - -	4,000 Sq. Ft.
23.	Cafeteria- - - - -	2,600 Sq. Ft.
24.	Staff Rest Rooms - - - - -	500 Sq. Ft.
25.	Exhibition Space - - - - -	3,000 Sq. Ft.
26.	Circulation - - - - -	14,956 Sq. Ft.
27.	Mechanical Equipment - - - - -	19,742 Sq. Ft.
	TOTAL INTERIOR SPACE - - -	183,939 Sq. Ft.
28.	Parking- - - - -	401,000 Sq. Ft.

IV. STATEMENT OF INTENT

The particular solution that I have proposed for this thesis project is primarily the result of a search for an image of civic government in general and specifically an image congenial to the needs of Tempe. This search was undertaken under the constraints of what I consider to be real and important design contingencies that have a direct bearing on the results that I have developed.

A. SYMBOLIC NEEDS

First, I felt that the bureaucratic or administrative function of this project should not dominate the project in importance by sheer size or by submerging the court and policy making and leadership functions into undifferentiated structure. I felt they needed to be given the importance they merit in regards to the gravity of their work and symbolic significance as the representative body of the people. I felt that the services of the City should form the supporting structure as they are the supporting functions.

B. CITIZEN PARTICIPATION

Secondly, I felt very strongly that there is a great need for the people of the City to have a sense of participation in this complex as they should in their government. This lead to the development of a shaded pedestrian street that locates the people in close proximity to the services that are offered. On one side of the street are the services and on the other are

The spaces where the citizens can actually be a part of functions going on in the complex. These functions are the exhibition spaces, the little theater, crafts area, club space, etc. So the complex has a band of spaces on the south and west periphery that are services and parallel to that are a band of social function spaces. I expanded the gymnasium facility of the police in order that the possibility would be present for the police to offer classes to the young men of the community so that a better relationship might be developed between the law enforcement and the future adult citizen. In addition, I felt it should be possible for the whole staff of the city to use that space.

C. STRENGTHENING THE BUSINESS STREET

Thirdly, as stated earlier, there is a need to strengthen the business street (i.e. Mill Avenue), so I located the major municipal function on that street. As one moves down Fifth Avenue east, the complex changes from municipal function to cultural function which are more congenial to the residential development in that area. This progression ends with the library which has a need for the quieter condition of that part of the site.

D. REGIONAL CHARACTER

Fourthly, there is the development of the regional character of the structure. Here the need for an image that was particularly characteristic of T mpe lead me to choose

the site that had the worst possible sun control problem. In site "A" (see figure 7), the orientation is to the major streets. The same direction that the most severe sun was coming from. This allowed for the development of the sun screen control to block out the sunlight and prevent severe heat penetration into the structure. In addition, it allows for a view through the louvers down to the street. An attempt was made to minimize flat roof area in order to give the maximum shelter with the sun control device. This form, in addition, aids the flow of air toward the top moving over the surface of the inclosed space. Since the inclosed space is generally free of direct sunlight, large glass area could be used. This eliminated the necessity for heavy masonry walls to slow down heat penetration that eventually carries the heat, in any case, into the structure. Since the glass area allows for immediate transfer of heat and in addition it offers the possibility of large opening surfaces, then heat could be removed from the structure by simple ventilation in the evening hours.

Since it is desirable to minimize the volume of air conditioned space, I developed a large percent of exterior circulation, thus cutting down on the interior corridor needs.

E. ACCESSIBILITY TO THE PUBLIC

Fifthly, a large covered parking area is provided in a location that encourages pedestrian movement through the

complex as well as makes the complex accessible to the public.

One of my classmates commented that my solution was more like a shopping center than a city complex, and indeed it is a shopping center for services provided by the City for its citizens.

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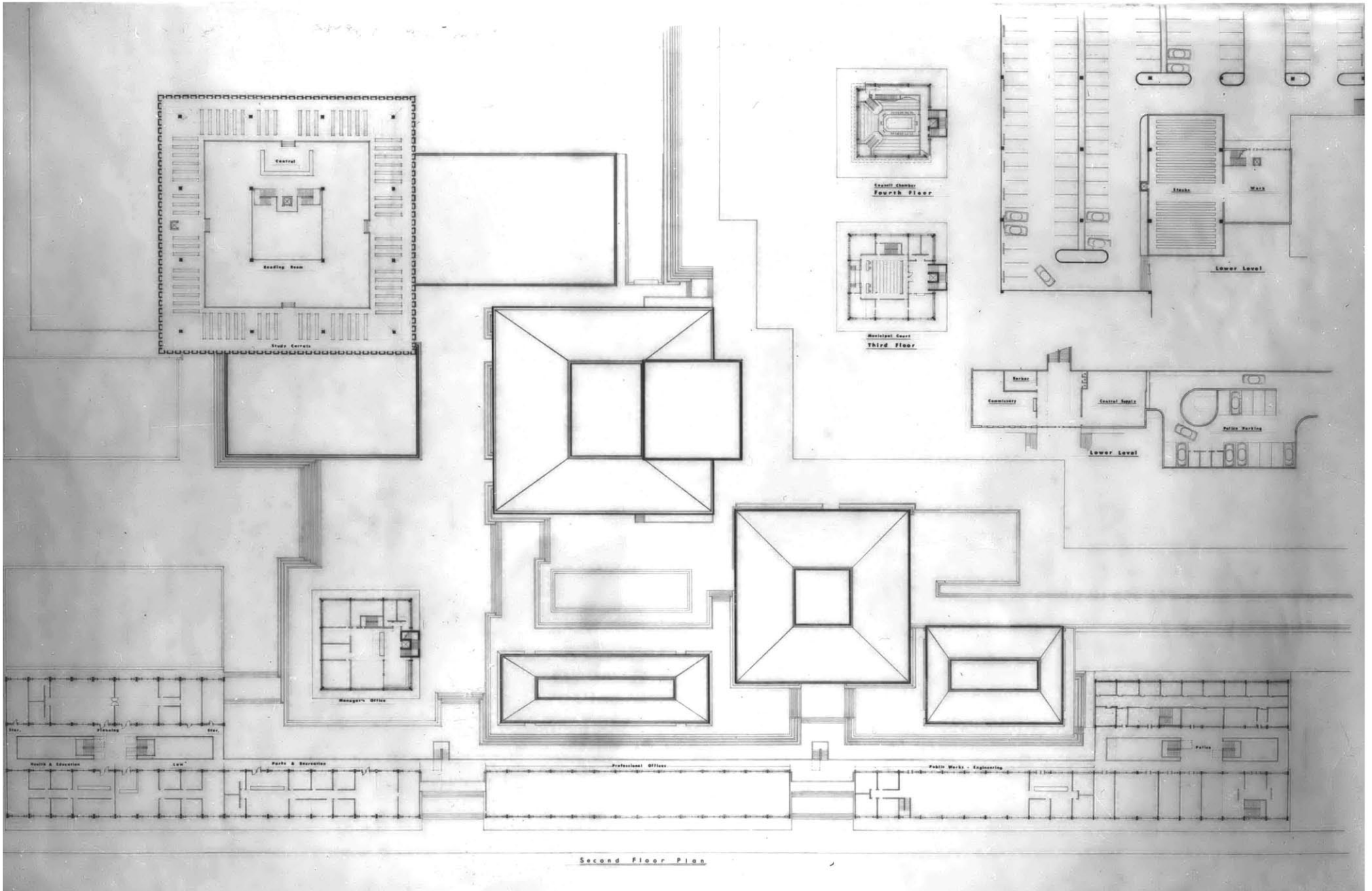
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Statistical Review

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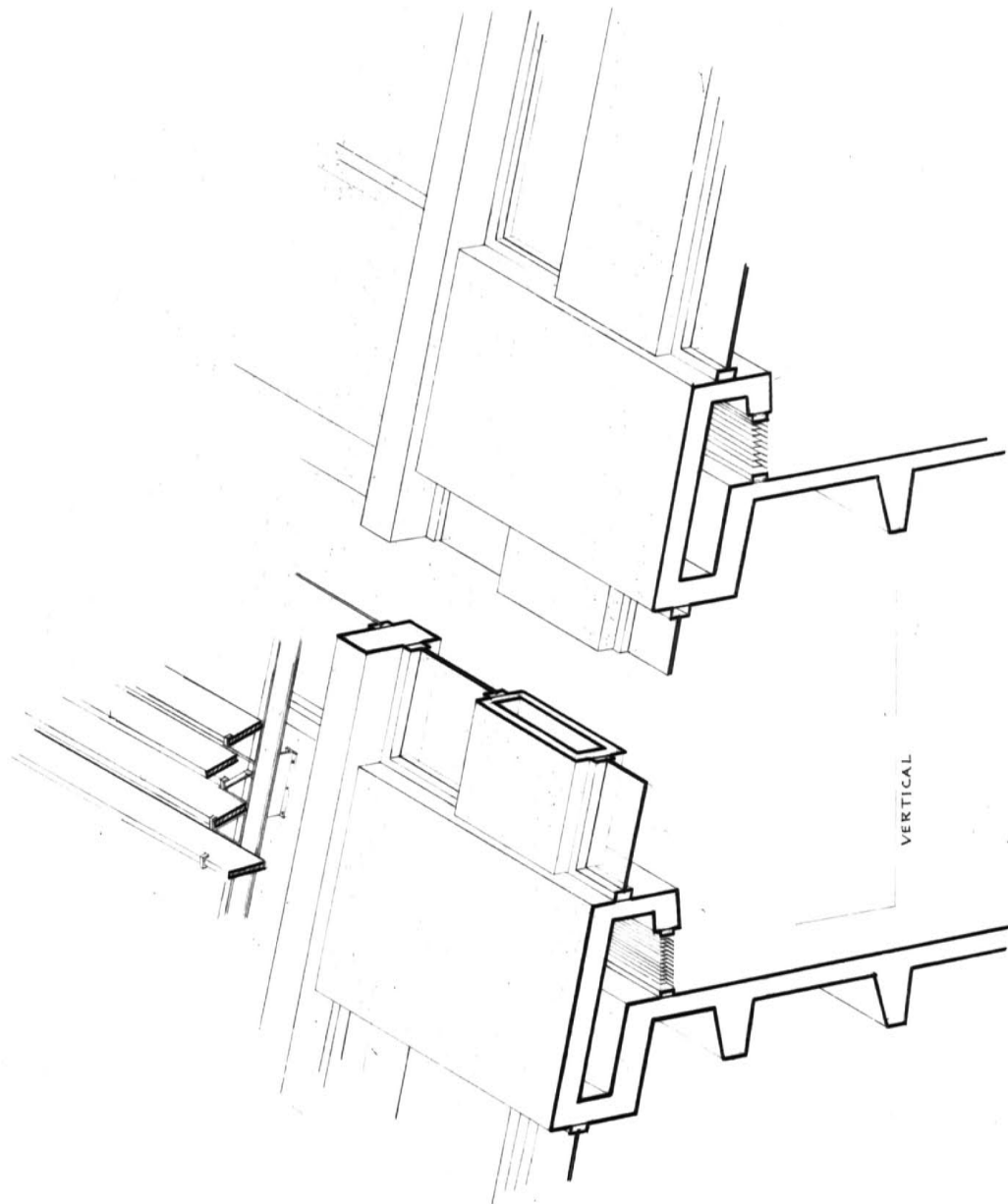
Bach. of Arch. Thesis
Winter, 1966
John Anton Berg



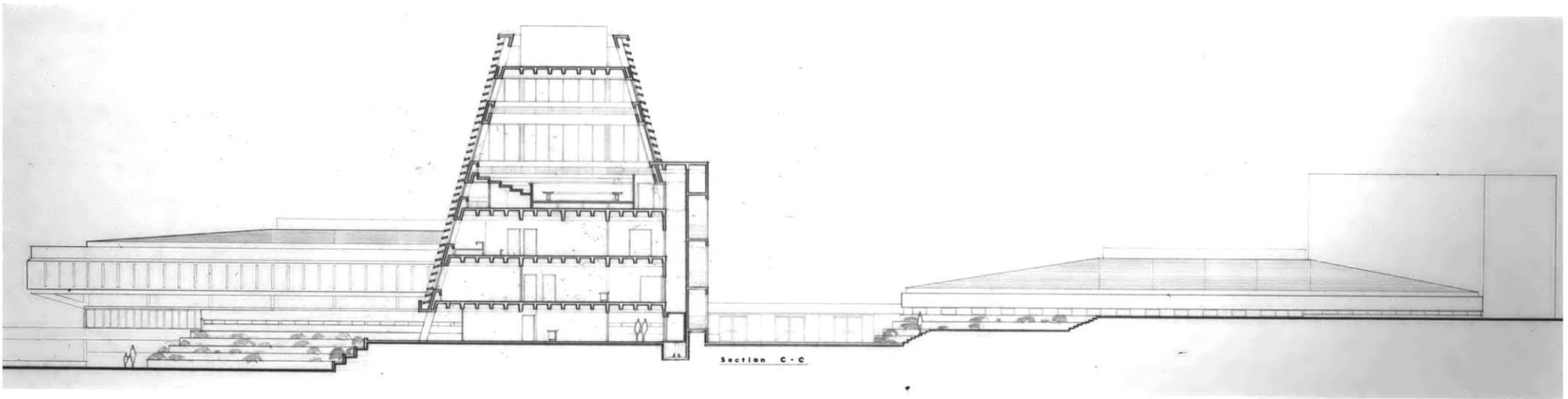
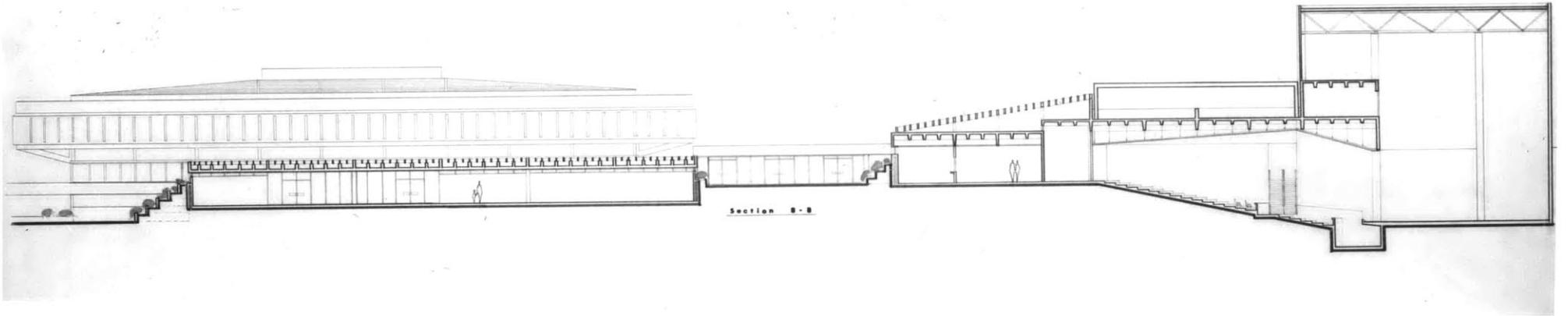
First Floor Plan

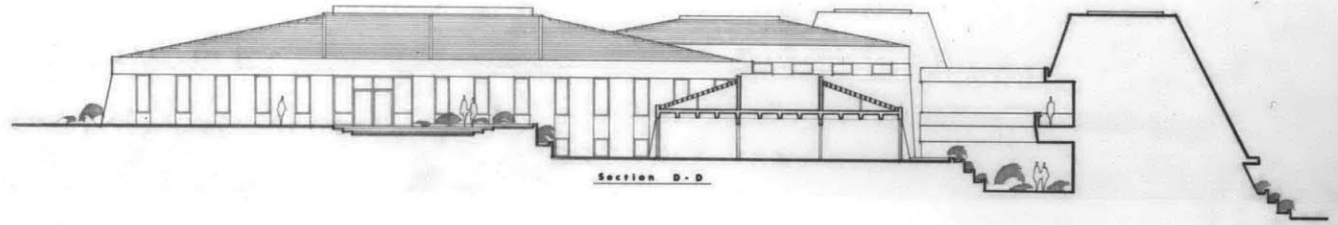


Second Floor Plan

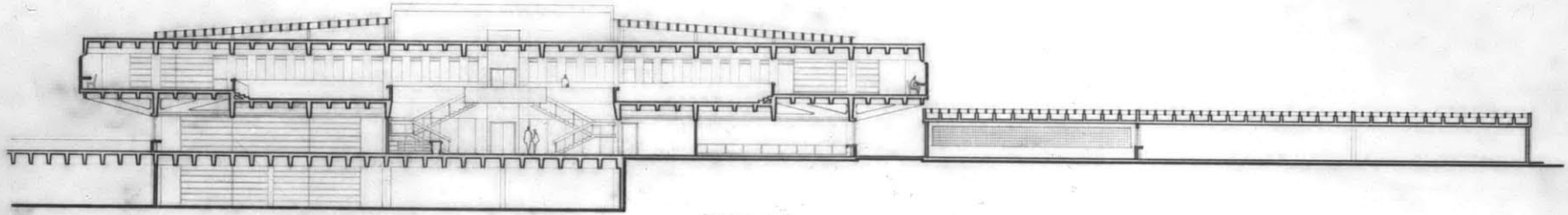


ISOMETRIC DETAIL

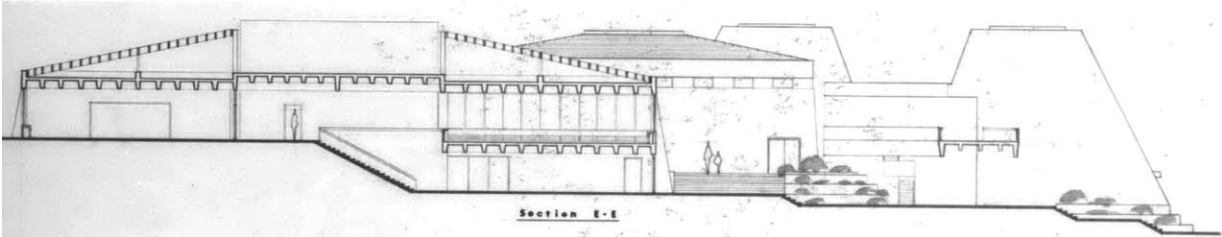




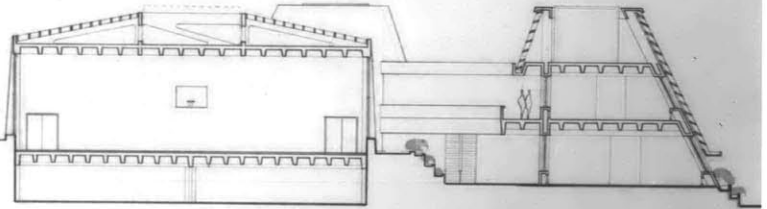
Section D-D



Section A-A



Section E-E



Section F-F