THE DESIGN OF A NEW JR. HIGH SCHOOL FOR THE EANES INDEPENDENT SCHOOL DISTRICT YET UNNAMED JR. HIGH SCHOOL

by

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A THESIS

IN

ARCHITECTURE

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Design Critic (ARCH 4631): Prof.

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Introduction

Introduction

This document deals with the issues, problems, and priorities involved with the designing of a junior high school in the Eanes Independent school district. The area served by the eanes independent school district is one of the fastest growing areas in the greater Austin area.

The strain on the existing schools makes them inadequate by the time any expansion project could be completed. Thus a new school on a large campus should be addressed.

Mission statement

Mission statement

This program is the background and needs for a Jr. high school for the eanes independent school district. The school will designed for 900 students and up to 90 staff. The school will provide for the total education of the students who attend. This program os for the actual design of the school.

GOALS AND OBJECTIVES

GOALS AND OBJECTIVES

Provide efficient learning environment.

Provide basis for future expansion.

Provide for future integration of computers.

Provide for immediate integration of computers.

Develop the site into a usable campus with as little damage to its character and existing trees as possible.

Provide a facility to last 30 years or longer.

Provide for community needs.

Design a school that looks like a school.

Stay away from a clod impersonal environment.

Provide the most efficient building within the limits of the program.

Design with the age and destructiveness of the students.

THESIS STATEMENT

Thesis Statement

The main area of concern in my thesis is the integration of energy efficient design opportunities into the design process, with a heavy focus on passive solar design, from the onset. I have worked on an office where they had a contract form the state to consult with architects how where working on schools around the state. The only problem was that the consultation was not until after construction documents where completed. This severely limited the options available. When the consultation was in the design phase the results were much greater. The ares that this can effect with great impact are the selection of materials and the facade in relationship the sun. This 'basically' covers almost aspects involved in the design of a piece of architecture. The most critical issue in my mind is the relationship with the sun. The sun can be the best friend or worst foe of the designer. The sun can help to determine the materials of the design. The sun can effect the placement of the project on the site, for maximum efficiency of interaction with the sun. The removal of the walled or prison feeling of the schools. This is mostly due to the placement of the classes in the interior of the building and lack of windows. Even when the classrooms are placed by an exterior wall, the designers usually put few windows. I believe the classroom should be a window to the world. The computer as a design tool for the design process is th last area addressed here. The capabilities of the computer to represent in 3-D the ideas of the designer, cannot be ignored. Its capabilities to represent these ideas to the client in a easily understandable form grow with every year. Six months ago, the capabilities for a TV style and resolution presentation lacked in quality. Today, Full resolution is possible, tomorrow, Who Knows?

BACKGROUND OF E.I.S.D.

BACKGROUND OF E.I.S.D.

STUDENT PROFILE This school district is 99% white. The median income of the families in this district is above average. Well above average. The students can be described as spoiled, the control the parents have over the students begins to slip during this period of the student's development.

POLICIES OF THE SCHOOL DISTRICT:

Attendance: Every student is expected to attend class every day that the school is unless the student is sick. The parents can request that the student be allowed to miss a few days, but all missed class work must be made up. If the student skips class the missed class work is considered a zero.

Guidance: the school provides several counsellors to help the students deal with their problems. These people are there for the students and are willing to help in any way they can.

Lockers: Every student is to be issued a locker.

Text books: The school provides the books for the students. They are to be returned at the end of the semester is a usable condition, or the student will be fined.

Dress and grooming: This issue is currently under review by the school board, and a decision is not expected until January.

Discipline: The school will send home papers to the parents for permission to use corporal punishment on the students. The other forms of punishment include: in school suspension, after school detention and cleaning duty, and suspension.

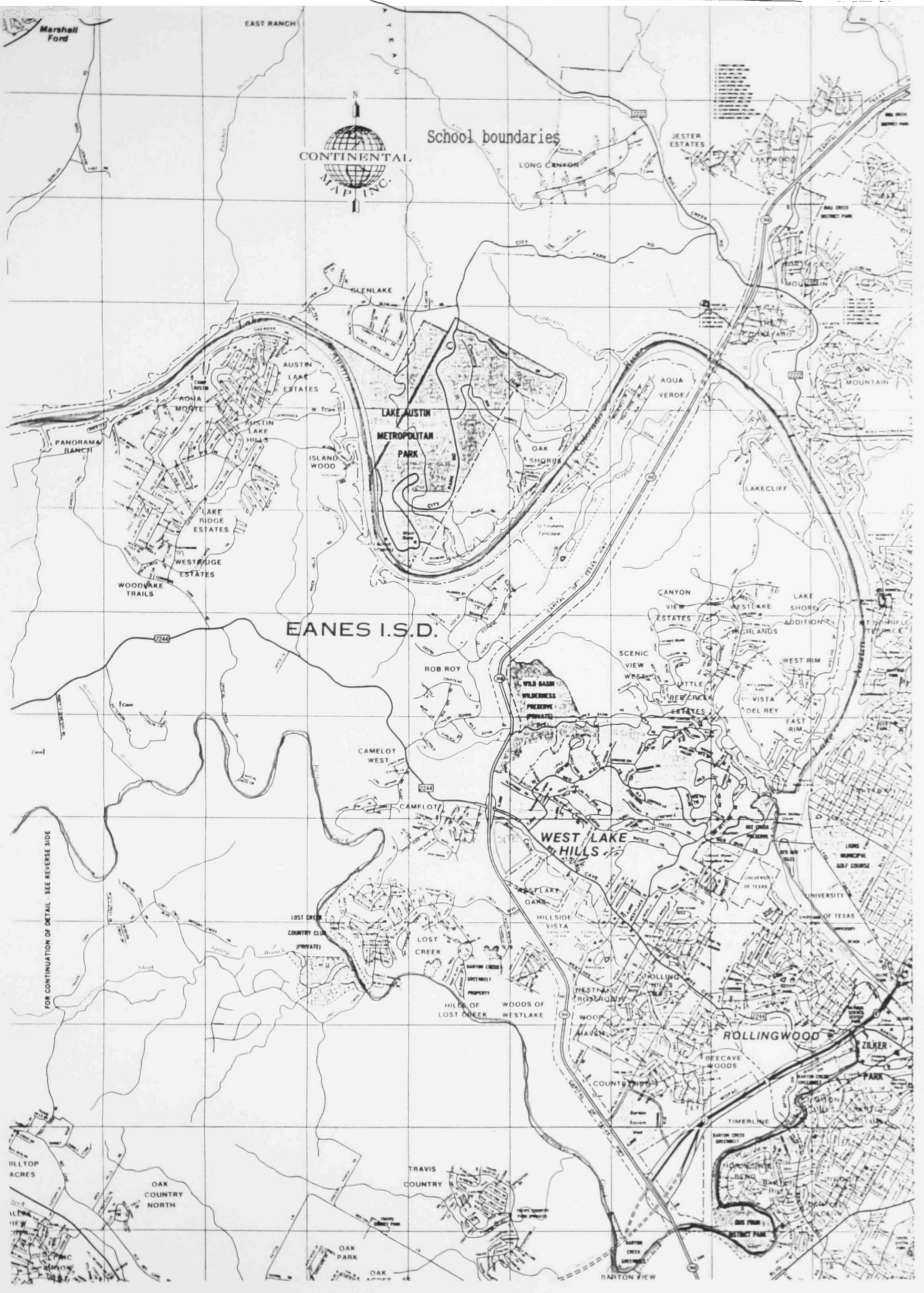
STUDENT DISTRIBUTION

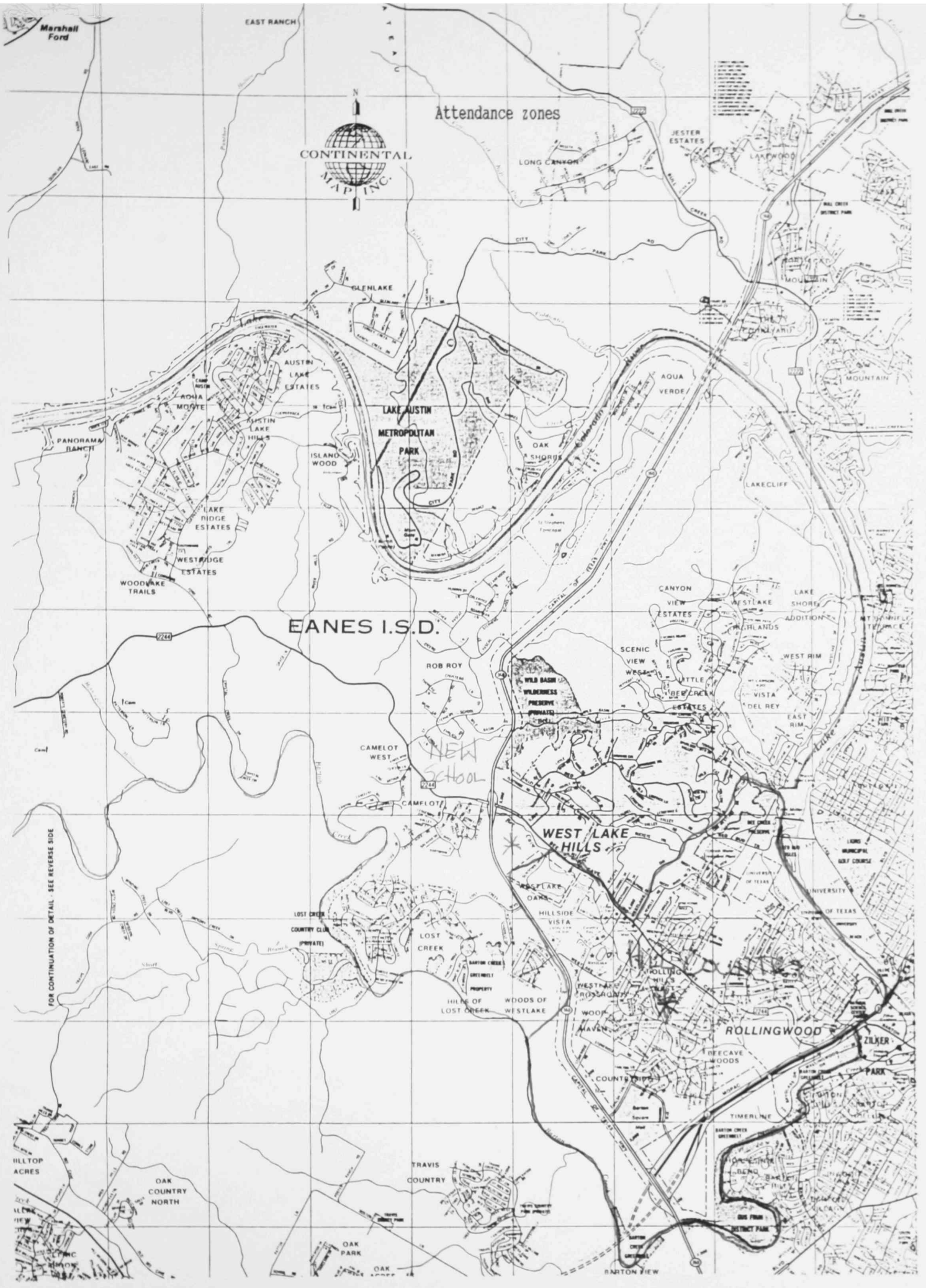
Present school setup: The school system currently has two elementary schools serving k-2, 3-5 respectively. one middle school serving grades 6-8, and one high-school serving grades 9-12.

Proposed school setup: The proposed setup in to have the grades six and seven stay at the exiting school, and move the grades eight and nine to the new school. I would propose to divide the grades six-eight and send half to each school. This is reflected in the illustration on page 16.

School boundaries: The eanes independent school boundaries currently include the cities of Rollingwood, Westlake, and Robroy.

Attendance zones: The proposed attendance zones for the new school are all of the neighborhoods outside the loop. The neighborhoods inside the loop are of a fixed size and have a very slow growth. The existing school was designed to handle this amount of students. The areas outside the loop are prone to very fast growth rates, and will soon out grow the current school capabilities. Thus the new school will allow for this growth.


School boundaries
CONTINENTAL MAP INC.
Marshall Ford
EAST RANCH
LONG CANYON
JESTER ESTATES
LAKEWOOD
GLENLAKE
AUSTIN LAKE ESTATES
AQUA MONTE
AUSTIN LAKE HILLS
PANORAMA RANCH
ISLAND WOOD
LAKE AUSTIN METROPOLITAN PARK
OAK SHORES
AQUA VERDE
MOUNTAIN
LAKECLIFF
LAKE RIDGE ESTATES
WESTRIDGE ESTATES
WOODLAKE TRAILS
EANES I.S.D.
CANYON VIEW ESTATES
WESTLAKE HIGHLANDS
LAKE SHORE ADDITION
SCENIC VIEW WEST
WEST RIM
ROB ROY
WILD BASIN WILDERNESS PRESERVE (PRIVATE)
LITTLE BEE CREEK ESTATES
VISTA DEL REY
EAST RIM
CAMELOT WEST
CAMELOT
WEST LAKE HILLS
LIONS MUNICIPAL GOLF COURSE
UNIVERSITY OF TEXAS
WEST LAKE OAKS
HILLSIDE VISTA
LOST CREEK COUNTRY CLUB (PRIVATE)
LOST CREEK
BARTON CREEK GREENBELT PROPERTY
HILLS OF LOST CREEK
WOODS OF WESTLAKE
ROLLING HILLS
WESTLAKE ROSEMOUNT
WOOD HAVEN
ROLLINGWOOD
ZILKER PARK
BEECAVE WOODS
COUNTRYSIDE
TIMERLINE
FOR CONTINUATION OF DETAIL - SEE REVERSE SIDE
HILLTOP ACRES
OAK COUNTRY NORTH
TRAVIS COUNTRY
OAK PARK
BARTON VIEW


Attendance zones
CONTINENTAL MAP INC.
EANES I.S.D.
WEST LAKE HILLS
ROLLINGWOOD
LAKE AUSTIN METROPOLITAN PARK
NEW SCHOOL
EAST RANCH
Marshall Ford
GLENLAKE
AUSTIN LAKE ESTATES
AQUA VERDE
PANORAMA RANCH
ISLAND WOOD
OAK SHORES
LAKECLIFF
LAKE RIDGE ESTATES
WESTRIDGE ESTATES
WOODLAKE TRAILS
CANYON VIEW ESTATES
LAKE SHORES ADDITION
SCENIC VIEW
WEST RIM
ROB ROY
WILD BASIN WILDERNESS PRESERVE (PRIVATE)
LITTLE BEE CREEK ESTATES
VISTA DEL REY
EAST RIM
CAMELOT WEST
CAMFLOT
LOST CREEK COUNTRY CLUB (PRIVATE)
LOST CREEK
HILLSIDE VISTA
HILLS OF LOST CREEK
WOODS OF WESTLAKE
BEECAVE WOODS
ZILKER PARK
TIMBERLINE
TRAVIS COUNTRY
OAK COUNTRY NORTH
OAK PARK
BARTON VIEW
FOR CONTINUATION OF DETAIL - SEE REVERSE SIDE

CONTEXTUAL ISSUES

THEORETICAL SITE ANALYSIS

The nature of the site has some influence as to the nature of the site. The options listed are not the only ones but the more ideal of the selection set. The following list generally ranges from general to specific items.

The site should be in or very near a populated area. That population is present in an residential area of the city. The residential areas near the school supply the students for the school. The school is best served by an area at least 5 times that of the school. The majority of the site should be flat for playing fields. The boundaries of the site are best if aligned in a north-south and east-west orientation. even though the alignment of the building will most likely be of a south-east orientation the street alignment will allow more of the school to be viewed by passerby. Every possible effort should be made to acquire a site with trees. And every possible effort should be made to preserve those trees.

MAN MADE ENVIRONMENTAL ISSUES/CONDITIONS

The loop and the streets bounding the proposed site are just about the only thing that effects the site in a major way. These are shown on the site map. The site is very well isolated in the middle of a residentially developed area.

Site Map 1
BEE
CAVES
ROAD
HIGHWAY
UC
NORTH

NATURAL ENVIRONMENT/CONDITION

Sun Angels: Time: Height on degrees [2]

May 11		June 21	
Sunrise:	5:15am	sunrise:	5am
8am:	34	8am:	37
10an:	56	10an:	63
Noon:	76	noon:	82
4pm:	34	4pm:	37
5pm:	22	5pm:	24
Sunset:	6:45pm	sunset:	7pm

Aug 21		Dec 21	
Sunrise:	5:30am	sunrise:	7am
8am:	33	8am:	10
10an:	58	10an:	28
Noon:	70	noon:	34
4pm:	33	4pm:	10
5pm:	19	5pm:	0
Sunset:	6:30pm	sunset:	5pm

Normals means and extremes [3]

Using the chart on the next page, and the line for San Antonio, It can be inferred that the area is a nice place to be. The temperature is in the middle for the state, the rain is a little low and the area receives just a little snow. Plus with the average wind speed and percentage of clear skies, the weather is not too any extreme.

NORMALS, MEANS AND EXTREMES

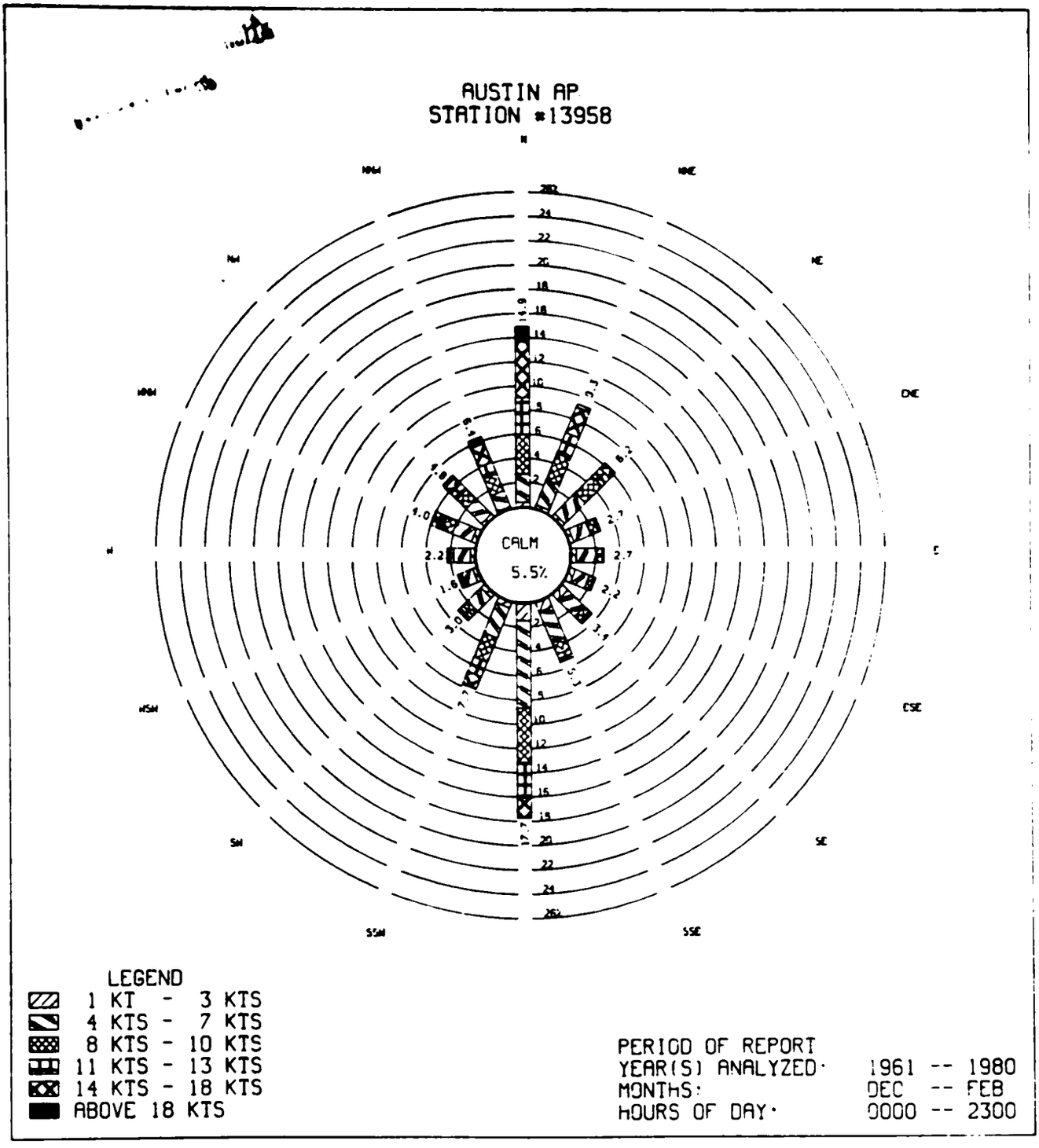
State and Station	Elevation Ground (Meters)	Temp. Normal (1941-1970) January Daily Maximum	January Daily Minimum	July Daily Maximum	July Daily Minimum	Annual	Extremes Length (Yrs)	Record Highest	Record Lowest	Normal Heating Degree Days (1941-1970) January	Seasonal	Precip. Normal (1941-1970) Wettest Month	Driest Month	Annual	Extremes Wettest Month	Driest Month	Maximum in 24 Hours	Snow Mean Total January	Seasonal	Extreme Maximum in 24 Hours
CALIFORNIA																				
SAN DIEGO	4	16.1	7.7	24.1	17.7	17.2	36	43.9	-1.7	174	837	68	T	240	193	0	78	T	T	T
SAN FRANCISCO	2	12.9	5.1	21.6	12.2	13.8	51	41.1	-6.7	288	1690	111	T	496	312	0	116	T	T	38
SAN FRANCISCO C O	16	13.3	7.6	17.7	11.8	13.7	42	38.3	-1.1	243	1711	115	T	525	291	0	93	T	T	T
SANTA MARIA	72	17.1	3.9	22.1	11.3	13.8	36	40.0	-6.7	250	1696	61	1	311	246	0	80	T	T	T
STOCKTON	7	11.6	2.4	34.0	14.8	15.9	19	45.6	-7.2	351	1559	74	T	360	204	0	76	0	T	8
COLORADO							91	47.8	-51.1							0	281			
ALAMOSA	2297	1.7	-18.2	27.8	6.3	5.3	33	33.9	-45.6	823	4782	30	6	170	89	T	46	112	904	401
COLORADO SPRINGS	1873	5.0	-8.8	29.1	13.9	9.1	30	37.8	-32.8	627	3596	79	7	400	203	T	95	112	1011	457
DENVER	1610	6.4	-8.9	30.8	14.8	10.1	44	40.0	-34.4	604	3342	67	11	394	186	T	90	211	1499	493
GRAND JUNCTION	1476	2.6	-8.6	33.9	17.9	11.5	32	40.6	-30.6	661	3114	27	12	219	88	0	40	193	673	231
PUEBLO	1428	7.5	-9.6	32.8	16.4	11.6	34	40.6	-35.0	601	2996	50	7	303	157	T	96	135	782	427
CONNECTICUT							91	40.6	-35.6							0	308			
BRIDGEPORT	2	2.7	-4.8	27.5	18.9	11.1	30	39.4	-20.6	599	3034	97	65	981	450	2	175	198	704	424
HARTFORD	52	0.8	-8.8	28.9	16.2	9.5	24	38.9	-32.2	692	3527	110	77	1102	555	9	308	328	1374	381
NEW HAVEN 1959	2	2.8	-5.6	26.9	17.3	10.1	25	37.8	-22.2	609	3276	117	81	1169	278	3	141	236	942	437
DELAWARE							86	43.3	-27.2							0	216			
WILMINGTON	23	4.6	-4.6	29.7	18.9	12.2	31	38.9	-20.0	568	2744	109	66	1022	307	4	138	152	528	396
DIST. OF COLUMBIA																				
WASHINGTON DULLES	88	5.1	-5.0	30.2	17.8	12.1	16	39.4	-22.2	567	2783	109	66	1019	462	T	302	152	564	391
WASHINGTON NATIONAL	3	6.6	-7.4	31.2	20.6	14.1	37	39.4	-17.2	506	2339	119	67	988	363	T	183	124	422	366
FLORIDA							89	42.8	-18.9							0	983			
APPALACHICOLA U	6	16.2	7.9	30.8	24.0	20.3	49	38.9	-10.6	204	756	229	68	1453	573	T	297	T	T	30
DAYTONA BEACH	9	20.0	8.7	32.0	22.4	21.4	35	38.9	-6.1	134	498	180	50	1270	505	T	236	T	T	T
FORT MYERS	5	23.7	11.3	32.8	23.2	23.3	39	38.3	-3.3	71	254	226	33	1370	511	0	276	0	0	0
JACKSONVILLE	8	18.1	6.9	32.2	22.2	20.2	37	40.6	-11.1	193	737	200	45	1384	492	T	258	T	T	38
KEY WEST INTL AP	1	24.2	18.8	31.8	26.7	25.7	25	35.0	7.8	9	36	186	39	1016	548	0	226	0	0	0
LAKELAND U 1978	65	21.4	10.6	32.4	22.6	22.3	37	38.3	-6.7	104	377	209	41	1256	398	0	257	T	T	25
MIAMI INTL AP	2	24.2	14.9	31.7	24.2	24.2	36	36.7	-0.6	29	114	229	42	1519	520	T	294	0	0	0
ORLANDO	29	21.4	10.0	32.1	22.7	22.1	36	38.9	-6.7	109	407	211	40	1301	497	T	246	T	T	T
PENSACOLA 1/	34	16.2	6.1	32.1	23.3	20.0	15	37.8	-12.2	237	877	207	80	1631	449	0	255	5	8	48
TALLAHASSEE	17	17.9	5.0	32.6	22.0	19.8	18	37.8	-12.2	227	868	227	71	1564	511	T	241	T	T	10
TAMPA	6	21.4	10.1	32.3	23.2	22.3	32	36.7	-7.8	113	399	214	45	1254	523	T	308	T	T	5
WEST PALM BEACH	5	23.9	13.3	32.0	23.4	23.6	42	38.3	-2.8	46	166	250	56	1570	631	1	387	T	T	T
GEORGIA							87	45.0	-27.2							0	457			
ATHENS	244	11.8	0.8	31.9	20.4	16.4	35	40.6	-18.3	372	1653	145	69	1283	380	T	252	18	43	127
ATLANTA	308	10.8	0.8	30.3	20.8	16.0	30	39.4	-19.4	389	1719	145	64	1228	399	T	144	18	38	211
AUGUSTA	41	14.2	1.1	32.7	21.1	17.4	28	41.1	-15.0	334	1415	129	59	1084	290	T	152	5	25	348
COLUMBUS	136	14.2	2.2	32.7	21.3	17.9	33	40.0	-16.1	317	1321	159	50	1294	336	0	173	T	10	356
MACON	108	14.8	2.7	33.4	21.5	18.4	30	41.1	-16.1	302	1244	131	59	1129	299	0	136	5	23	419
ROME	194	11.2	-1.1	32.4	19.5	15.7	31	41.1	-20.6	412	1954	157	74	1330	441	T	191	18	51	208
SAVANNAH	14	16.2	3.7	32.7	21.8	18.8	29	40.0	-12.8	268	1084	207	49	1299	511	1	179	T	10	41
HAWAII							74	37.8	-7.8							0	965			
HILO	8	26.4	17.2	28.3	19.7	23.0	37	34.4	11.7	0	0	400	168	3394	1291	9	399	0	0	0
HONOLULU	2	26.2	18.5	30.4	23.0	24.8	9	33.3	11.7	0	0	112	8	582	528	T	434	0	0	0
KAHULUI	15	26.4	17.7	30.2	21.1	24.0	14	35.6	8.9	0	0	91	5	468	347	0	145	0	0	0
LIHUE	31	25.2	18.0	28.9	22.6	23.9	24	32.2	10.0	0	0	101	40	1124	582	8	293	0	0	0
IDAHO							86	47.8	-51.1							0	182			
BOISE	865	2.3	-5.9	32.5	14.7	10.5	39	43.9	-30.6	620	3240	37	4	292	102	0	57	188	541	330
LEWISTON	431	3.2	-4.2	31.6	14.2	10.9	32	46.1	-30.0	582	3035	46	13	330	122	T	44	178	447	325
POCATELLO	1358	0.2	-10.6	31.6	12.3	8.2	29	40.0	-34.4	720	3923	37	9	274	101	T	46	249	1016	257

State and Station	Relative Humidity (Percent) January 7:00 a.m. EST	January 1:00 p.m. EST	January 7:00 p.m. EST	July 7:00 a.m. EST	July 1:00 p.m. EST	July 7:00 p.m. EST	Wind Speed (m.p.s.) Mean Speed January	July	Fastest Mile (1.6 Kilometers)	Sunshine (% of Possible) January	July	Annual Mean Number of Days Sunrise to Sunset Clear	Partly Cloudy	Cloudy	Precipitation .25mm or More	Snow, Sleet, Hail 25.4mm or More	Thunderstorms	Heavy Fog	Temperature Max 32.2°C	Min 0°C	Min -17.8°C
CALIFORNIA																					
SAN DIEGO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.5	3.2	22.8	71	68	149	116	100	42	0	[illegible]	23	3	[illegible]	0
SAN FRANCISCO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.2	6.0	75.9			162	102	101	62	[illegible]	[illegible]	17	[illegible]	[illegible]	0
SAN FRANCISCO C O	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.0	5.0	21.0	[illegible]	[illegible]				67	0	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SANTA MARIA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.0	2.9				177	159	79	45	[illegible]	[illegible]	81	[illegible]	24	[illegible]
STOCKTON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.0	3.7	20.6			186	75	104	52	[illegible]	[illegible]	44	86	24	[illegible]
COLORADO																					
ALAMOSA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.4	3.7				140	137	85	67	12	44	15	1	229	[illegible]
COLORADO SPRINGS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.4	4.3	26.8			130	119	116	87	12	59	21	16	161	7
DENVER	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.1	3.4	25.0	72	71	[illegible]	131	118	88	15	41	12	33	[illegible]	9
GRAND JUNCTION	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2.5	4.2	29.5	60	78	140	137	119	70	[illegible]	34		66	137	7
PUEBLO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.6	3.9	35.6	75	78	139	122	104	69	[illegible]	40		64	133	8
CONNECTICUT																					
BRIDGEPORT	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.8	4.5	30.0			101	[illegible]	[illegible]	118	[illegible]	21	29	[illegible]	102	•
HARTFORD	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.2	3.5	23.7	[illegible]	[illegible]	78	[illegible]	[illegible]	129	14	22	[illegible]	20	137	6
NEW HAVEN 1959	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.7	2.8	25.5	[illegible]	[illegible]	100	[illegible]	[illegible]	128	11	27	[illegible]	[illegible]	111	1
DELAWARE																					
WILMINGTON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.4	3.4	25.9			96	[illegible]	[illegible]	117	[illegible]	31	[illegible]	18	102	•
DIST. OF COLUMBIA																					
WASHINGTON DULLES	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.7	2.8	20.6			[illegible]	[illegible]	[illegible]	114	[illegible]	27	[illegible]	25	118	2
WASHINGTON NATIONAL	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.5	3.7	34.9	[illegible]	[illegible]	104	[illegible]	[illegible]	111	[illegible]	29	[illegible]	31	7	0
FLORIDA																					
APPALACHICOLA U	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.8	3.0	30.0	[illegible]	[illegible]	120	124	[illegible]	106	[illegible]	71	[illegible]	21	[illegible]	0
DAYTONA BEACH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.1	3.4	25.9			92	137	136	115	0	79	[illegible]	54	[illegible]	0
FORT MYERS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.8	3.0	41.1			102	162	101	113	0	94	[illegible]	103	1	0
JACKSONVILLE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.8	3.4	46.7	[illegible]	[illegible]	[illegible]	127	139	116	[illegible]	64	[illegible]	82	14	0
KEY WEST INTL AP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.4	4.4	37.6	72	77	100	[illegible]	102	111	0	62	[illegible]	43	[illegible]	0
LAKELAND U 1978	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.3	2.5		[illegible]	[illegible]	100	159	106	120	[illegible]	100	[illegible]	83	[illegible]	0
MIAMI INTL AP	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.2	3.5	33.1	[illegible]	74	73	173	119	129	0	74	[illegible]	30	[illegible]	0
ORLANDO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.0	3.3	28.6			93	[illegible]	124	116	0	81	25	106	[illegible]	0
PENSACOLA 1/	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.0	3.0	16.5	[illegible]	[illegible]	103	117	145	114	[illegible]	75	37	55	16	0
TALLAHASSEE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.4	2.5	25.9			96	135	134	119	0	81	53	88	35	0
TAMPA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.0	3.4	40.0	[illegible]	[illegible]	96	142	127	107	0	88	24	82	[illegible]	0
WEST PALM BEACH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.4	3.4	38.4			73	155	137	131	0	79	[illegible]	55	1	0
GEORGIA																					
ATHENS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.8	2.8	23.2			113	105	147	111	1	52	38	45	54	•
ATLANTA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.7	3.3	31.2	[illegible]	[illegible]	108	111	146	115	1	50	30	22	60	•
AUGUSTA	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.2	2.6	27.7			109	106	150	107	[illegible]	56	28	62	67	0
COLUMBUS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.4	2.5	24.6			114	101	150	111	[illegible]	58	20	74	46	0
MACON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.7	3.1	31.3	[illegible]	[illegible]	113	104	148	111	[illegible]	56	26	78	51	0
ROME	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]						105	117	[illegible]	122	1	61	29	59	81	•
SAVANNAH	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.8	3.3	29.5	[illegible]	[illegible]	104	111	[illegible]	112	[illegible]	64	40	58	36	0
HAWAII																					
HILO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.3	3.1	13.4	[illegible]	[illegible]	32	126	207	282	0	9	[illegible]	1	0	0
HONOLULU	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.4	6.1	30.0	[illegible]	73	90	176	99	101	0	[illegible]	0	10	0	0
KAHULUI	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.9	7.2	19.2	[illegible]	75	125	147	93	95	0	[illegible]	0	21	0	0
LIHUE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	4.6	5.8	32.6	[illegible]	62	51	176	138	202	0	9	0	[illegible]	0	0
IDAHO																					
BOISE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	3.8	3.8	27.3	[illegible]	[illegible]	123	91	151	91	[illegible]	15	19	43	124	2
LEWISTON	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			32.2			93	77	195	103	[illegible]	16	21	39	94	3
POCATELLO	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	5.0	4.1	32.2	[illegible]	[illegible]	109	96	160	93	13	23	15	33	170	10

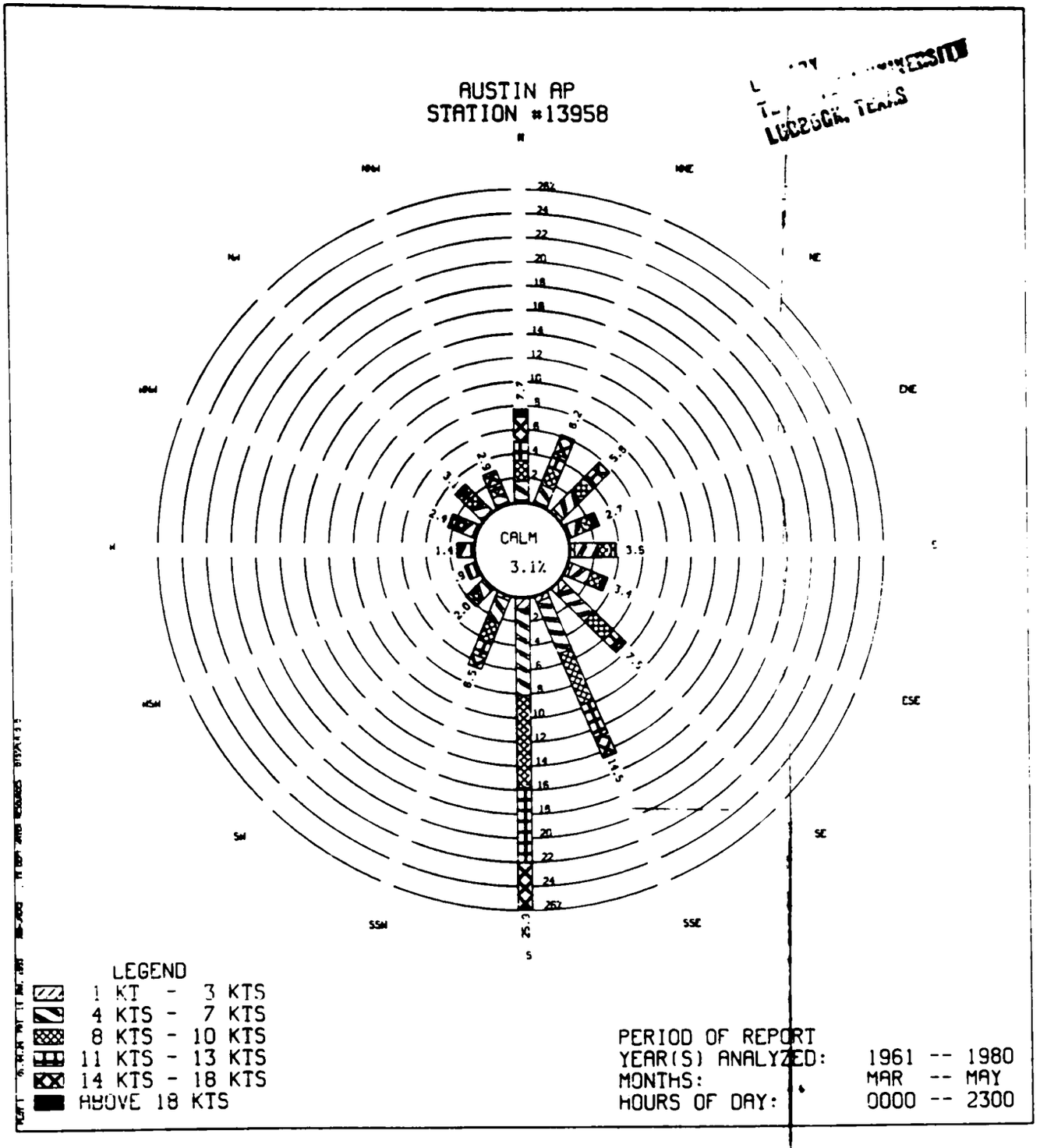
Normal means and extremes

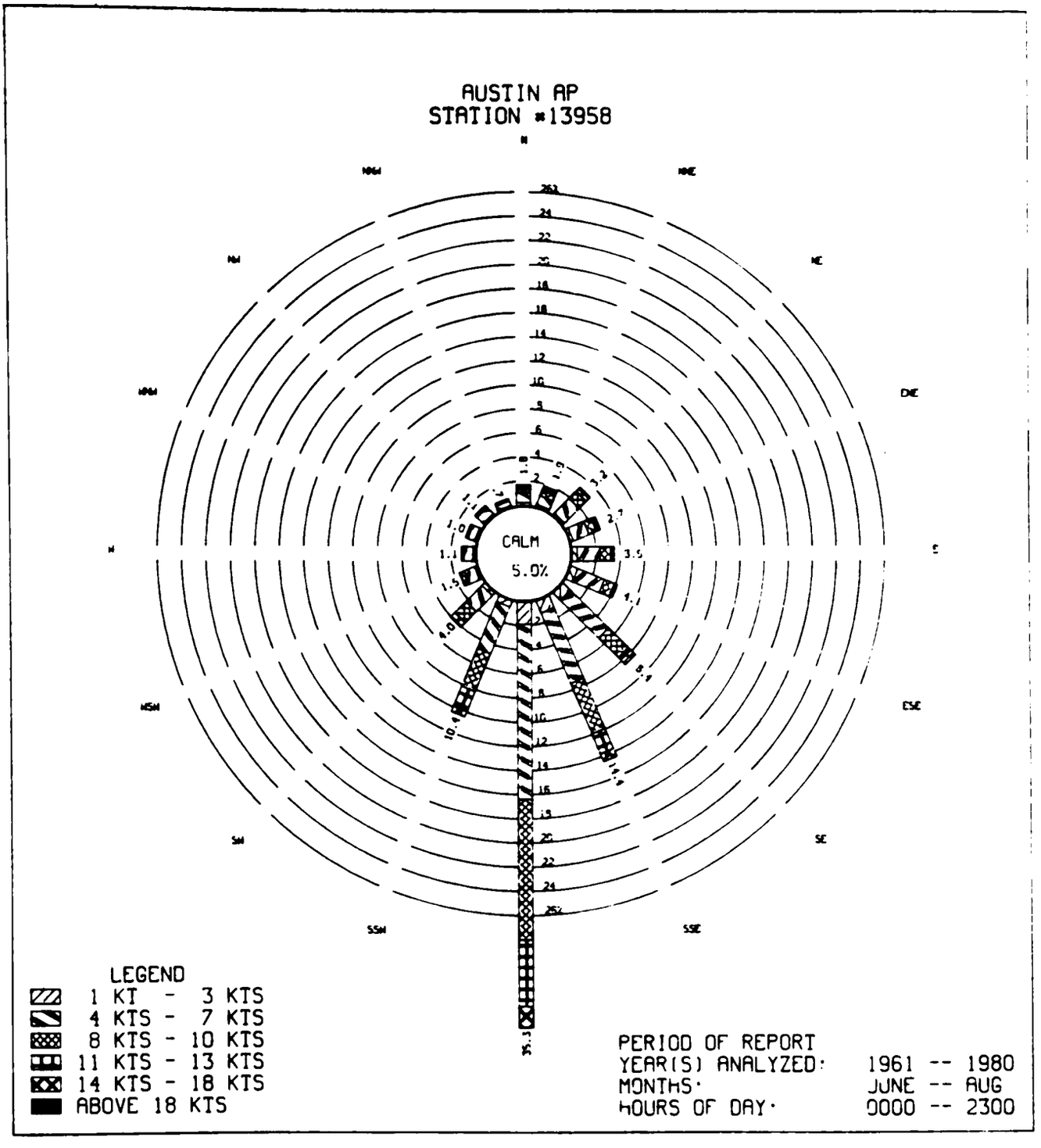
The average wind direction charts on the next four pages show that the area has wind blowing from all directions all year around, however, the majority comes from the north.

Wind chart 1

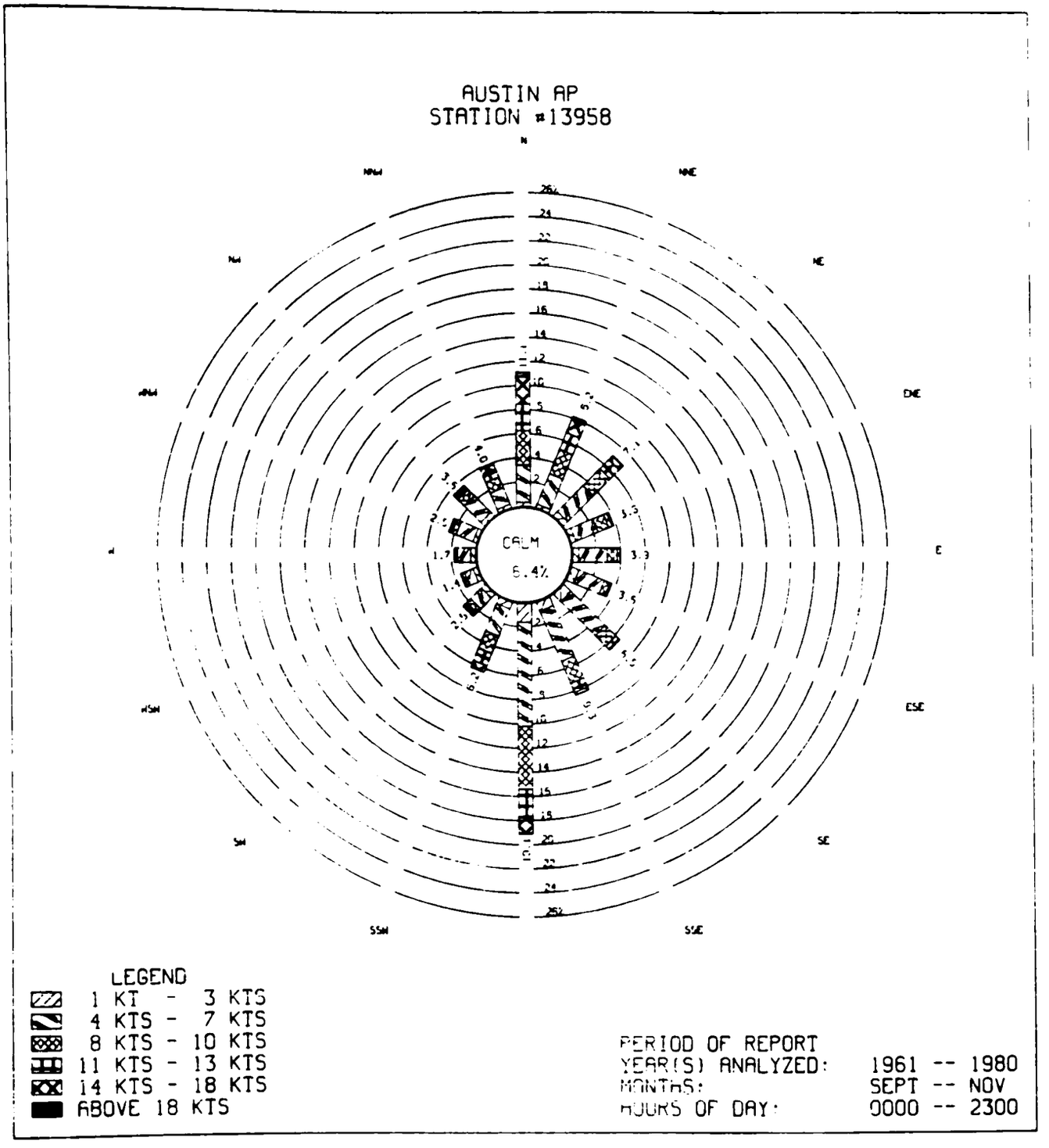

AUSTIN AP
STATION #13958
CALM
5.5%
LEGEND
1 KT - 3 KTS
4 KTS - 7 KTS
8 KTS - 10 KTS
11 KTS - 13 KTS
14 KTS - 18 KTS
ABOVE 18 KTS
PERIOD OF REPORT
YEAR(S) ANALYZED: 1961 -- 1980
MONTHS: DEC -- FEB
HOURS OF DAY: 0000 -- 2300

Wind chart 2


AUSTIN AP
STATION #13958
CALM
3.1%
LEGEND
1 KT - 3 KTS
4 KTS - 7 KTS
8 KTS - 10 KTS
11 KTS - 13 KTS
14 KTS - 18 KTS
ABOVE 18 KTS
PERIOD OF REPORT
YEAR(S) ANALYZED: 1961 -- 1980
MONTHS: MAR -- MAY
HOURS OF DAY: 0000 -- 2300


AUSTIN AP
STATION #13958
CALM
5.0%
LEGEND
1 KT - 3 KTS
4 KTS - 7 KTS
8 KTS - 10 KTS
11 KTS - 13 KTS
14 KTS - 18 KTS
ABOVE 18 KTS
PERIOD OF REPORT
YEAR(S) ANALYZED: 1961 -- 1980
MONTHS: JUNE -- AUG
HOURS OF DAY: 0000 -- 2300

Wind chart 4


AUSTIN AP
STATION #13958
N
NNE
NE
ENE
E
ESE
SE
SSE
S
SSW
SW
WSW
W
WNW
NW
NNW
CALM
6.4%
LEGEND
1 KT - 3 KTS
4 KTS - 7 KTS
8 KTS - 10 KTS
11 KTS - 13 KTS
14 KTS - 18 KTS
ABOVE 18 KTS
PERIOD OF REPORT
YEAR(S) ANALYZED: 1961 -- 1980
MONTHS: SEPT -- NOV
HOURS OF DAY: 0000 -- 2300

SITE ANALYSIS

SITE ANALYSIS

The site is well positioned in the middle of the school zones.

It has excellent access from any of the roads that it borders.

The topographic features of the site make it well suited for any development I should choose.

All in all it is a very good site for access. The property is now in the hands of the FDIC and should be very easy to aquire for the school district. The views of and on the property can be very powerful. The area around the site has a height limit on the houses that is within the tree canopy's and thus very few houses poke out of the trees. The closeness to the loop could be a problem with noise. The potential problem could be eliminated by using a tree berm on the side that border the loop. The variety of vegetation on the site and the ability to reuse the existing vegetation in the final plan allow for a very low cost site development. The lack of sewage lines in the area require a septic approach. The field required by the septic tanks can be a positive influence on the design if the school.

ACTIVITY ANALYSIS

Department: Administration

Activity: Admin

Users: Principal, Vice, Secretaries

Users:

Staff:

Staff: 4

Primary Activities: The day to day activities that allow the school to operate as they do. Including: Thinking, recordkeeping, meetings

Secondary Activities: Typing, Filing, reading, etc..

Time Duration: All day

Nature: Personal

Noise: Low

Activity level: Low

Equipment Requirements: None

Adjancies: Offices, Attendance, counseling, restrooms.

Space Requirements: Offices, waiting rooms, P/A, sto.

Department: Administration

Activity: Attendance

Users:

Users:

Staff: Secretaries

Staff: 2

Primary Activities: The activity of keeping track of who is and isn't in school. Including: Attendance, Recordkeeping

Secondary Activities: Typing, Reading, Calling

Time Duration: All Day

Nature: Office like

Noise: Low

Activity level: low

Equipment Requirements: none

Adjancies: Administration

Space Requirements:

Department: Administration

Activity: Counseling

Users: Students

Users: 6-10

Staff: Counselors

Staff: 4

Primary Activities: Maintaining the Mental health of the students. Including: Counseling, Talking, comforting

Secondary Activities: Writing, typing, filing, Office work.

Time Duration: All Day

Nature: Personal

Noise: Low

Activity level: Low

Equipment Requirements: None

Adjancies: Waiting, Restrooms

Space Requirements: As An Office

Department: Administration

Activity: Discipline

Users: Students

Users: Variable

Staff: Grade Advisor

Staff 3

Primary Activities: Talking to the students about what they did wrong. Including Talking,

Secondary Activities: Typing, filing,

Time Duration: All Day

Nature: Personal

Noise: low

Activity level: Low

Equipment Requirements: None

Adjancies: Administration, Attendance, Nurses office, Restrooms

Space Requirements: Three offices, waiting with Admin.

Department: Administration

Activity: Nurse

Users: Students, Staff
Users: Varies

Staff: Nurse
Staff: 1

Primary Activities: Caring for sick students.

Secondary Activities: Recordkeeping

Time Duration: All Day

Nature: Personal

Noise: Low-Medium

Activity level: Low

Equipment Requirements: Minimum Medical Equipment

Adjancies: Administration

Space Requirements: Office, waiting, restrooms, and a Few beds.

Department: Administration Activity: Parent conf.

Users: Parent, teachers and students Staff:Administration
Users: three-five # Staff: any

Primary Activities: This is to involve the parents in the learning process.

Secondary Activities:

Time Duration: Any time during the day

Nature: personal

Noise: Low

Activity level: Low

Equipment Requirements: None

Adjancies: Administration

Space Requirements: Conference Room

Department: Art

Activity: Painting

Users: Students

Users: 30-40

Staff: Teachers

Staff: 1

Primary Activities: Learning the basics of painting.
Including: Painting

Secondary Activities: Cleaning, viewing, writing.

Time Duration: One Period

Nature: Social, Instructional

Noise: Low

Activity level: Med

Equipment Requirements: Sink.

Adjancies: Restroom, storage

Space Requirements: Classroom and closet

Department: Art

Activity: Pottery

Users: Students
Users: 30-40

Staff: Teacher
Staff: 1

Primary Activities: To Learn how to produce pottery on both hand level and on a wheel.

Secondary Activities: Cleaning

Time Duration: One class period

Nature: Social, Instructional

Noise: Medium

Activity level: Medium

Equipment Requirements:Potters wheel, sink, kiln

Adjancies: Kiln room, storage, and restrooms

Space Requirements: Classroom and Storage

Department: Art

Activity: Drawing

Users: Students
Users:30-40

Staff: Teacher
Staff: 1

Primary Activities: Learning how to draw, using ink, pencil, with or without color

Secondary Activities:

Time Duration: One class period

Nature: Social, instructional

Noise: Medium

Activity level: Medium

Equipment Requirements:

Adjancies:

Space Requirements: Classroom

Department:Art

Activity: Ceramics

Users: Students
Users: 30-40

Staff: Teacher
Staff: 1

Primary Activities: Making ceramic items and after first firing adding glaze for the finished product.

Secondary Activities: Cleaning up.

Time Duration: One class Period

Nature: Social, Instructional

Noise: Medium

Activity level: Medium

Equipment Requirements: kiln, sink

Adjancies: Kiln room, Restroom

Space Requirements: Classroom and storage

Department: Cafeteria

Activity: Eating

Users: Students and staff

Users: 300-400

Staff: Custodians

Staff: 3

Primary Activities: Eating lunch or breakfast.

Secondary Activities: Cleanup, homework

Time Duration: One Hour for lunch, one hour for breakfast

Nature: Social

Noise: High

Activity level: High

Equipment Requirements: Big tables

Adjancies: Restrooms, kitchen, outside recreational area

Space Requirements: Cafeteria, table and chair storage

Department: Cafeteria

Activity: Assemblies

Users: Students and staff
Users:400-900

Staff: Teachers
Staff: 3-10

Primary Activities: Gathering together most of a grade level together for a(n) informational presentation, or for a student presentation.

Secondary Activities:

Time Duration: One hour

Nature: Social, Instructional, Entertainment

Noise: High

Activity level:Low to High

Equipment Requirements: 900+ seats

Adjancies: Restrooms, table and chair storage

Space Requirements: Cafeteria

Department: Cafeteria

Activity: Study Hall

Users: Students
Users: 30-900

Staff: Teachers
Staff: 3-10

Primary Activities: homework and socializing before or after school. also a dedicated class period during ths normal school day.

Secondary Activities:

Time Duration: One period or before and after school

Nature: Social, work

Noise: Low to High

Activity level: Low to high

Equipment Requirements: Tables and Chairs

Adjancies: Restrooms and storage

Space Requirements: Cafeteria

Department: Food Preparation

Activity: Serving

Users: Students
Users: 100-300

Staff: Kitchen
Staff: 6-10

Primary Activities: Giving the food to the students as they pass through the line to the cash register to pay for what hey ordered.

Secondary Activities:

Time Duration: 20-30 minutes per lunch

Nature: Work

Noise: Medium

Activity level: Low

Equipment Requirements: Serving line Equipment

Adjancies: Kitchen, Cleanup

Space Requirements: Two serving lines with two entrances and exits each.

Department: Food Prep

Activity:Preparation

Users:

Users:

Staff: Kitchen

Staff: 6

Primary Activities: Cooking the food for the students and teachers consumption. Including: Cooking, cleaning.

Secondary Activities:

Time Duration: 6 hours a day

Nature: Service

Noise: Low

Activity level: Medium

Equipment Requirements: Commercial kitchen

Adjancies: Serving, Cleanup

Space Requirements: As Commercial kitchen

Department: Food Prep

Activity: Cleanup

Users:

Users:

Staff: Kitchen

Staff: 2

Primary Activities: Cleaning up the remains of the lunch and breakfast, including the items used in the preparation of the food.

Secondary Activities:

Time Duration: Three hours a day

Nature: Service

Noise: Medium

Activity level: Medium

Equipment Requirements: Commercial dishwasher

Adjancies: Food prep, cafeteria

Space Requirements: One tray return room and dishwasher.

Department: Home Economics

Activity: Cooking

Users: Students

Users: 30

Staff: Teacher

Staff:1

Primary Activities: Teaching the students how to coon and about nutrition in the home.

Secondary Activities:

Time Duration: One period a day

Nature: Instructional, Social

Noise: Medium

Activity level: Medium

Equipment Requirements: Many independent kitchens

Adjancies: Storage, classroom

Space Requirements: 3-7 separate kitchens and a classroom

Department: Home Economics

Activity: Sewing

Users: Students

Users: 20

Staff: Teacher

Staff: 1

Primary Activities: Teaching students how to sew and maintain the garments of the day.

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional, Social

Noise: Low

Activity level: Low

Equipment Requirements: Sewing machines

Adjancies:

Space Requirements: Classroom with storage

Department: Home Economics

Activity: Day Care

Users: Students
Users: 10

Staff: Teacher
Staff: 1

Primary Activities: Teaching students how to keep small children, how to care for the children, and how to keep them healthy.

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional, Social

Noise: High

Activity level: High

Equipment Requirements: Baby beds, changing tables, toys, etc.

Adjancies:

Space Requirements: Classroom/ playroom

Department: Humanities

Activity: English

Users: Students
Users: 30

Staff: Teacher
Staff: 1

Primary Activities: This is installing the basics of the English language into the students of the class. There is are two classes in a row for each of the grade levels, and two teachers/sections for each level.
Secondary Activities: Reading, writing, learning, etc.

Time Duration: Two classes a day

Nature: Instructional

Noise: Low

Activity level: Low

Equipment Requirements:

Adjancies: Teachers office

Space Requirements: One classroom, and the adjacent office

Department: Humanities

Activity: Health

Users: Students
Users: 30

Staff: Teacher
Staff: 1

Primary Activities: Imparting upon the students a basic knowledge of the functioning of the human body. This includes simple life saving procedures like CPR. The course should begin the groundwork for future sex education courses.
Secondary Activities: Reading, Writing, etc.

Time Duration: One class a day

Nature: Instructional

Noise: Low

Activity level: Low - Medium

Equipment Requirements: CPR dummies, Etc..

Adjancies:

Space Requirements: Classroom, and some storage

Department: Humanities

Activity: Foren Lang

Users: Students
Users: 30

Staff: Teacher
Staff: 1

Primary Activities: To teach the students how to communicate in a language other than the one they are used to speaking.

Secondary Activities: Reading, writing, speaking.

Time Duration: One class period a day

Nature: Instructional

Noise: Low

Activity level: Low

Equipment Requirements:

Adjancies:

Space Requirements: Classroom.

Department: Library

Activity: Audio Vis.

Users: Students
Users: 30

Staff: Teacher
Staff: 1

Primary Activities: This is the capabilities of the library facilities to allow the teachers to present to their class a communication medium other than the normal class presentation.
Secondary Activities:

Time Duration: During a normal class time

Nature: Visual

Noise: Low

Activity level: Low

Equipment Requirements: VCR, TV, Projector, Screen, Etc.

Adjancies: Library

Space Requirements: One Viewing room.

Department: Library

Activity:Checkout

Users: Students

Users: any

Staff: Librarian

Staff: 1

Primary Activities: Properly checking the book out to the student that wants to read the book outside the library

Secondary Activities:

Time Duration: Less that five minutes

Nature: Service

Noise: Low

Activity level: Low

Equipment Requirements: Book demagnetizer, computer link to student database

Adjancies: Library

Space Requirements: A desk with the equipment listed above and in the path of the the exit.

Department:Library

Activity: Computer

Users: Student
Users: 3-5

Staff: Librarian
Staff: (1)

Primary Activities: This is a few computers available to the students in the library for their use.

Secondary Activities:

Time Duration: One hour three times a day

Nature: Recreational, Instructional, Work

Noise: Low

Activity level: Low

Equipment Requirements: 3-5 Computers

Adjancies: Library, Checkout

Space Requirements: A desk for each computer in view of the checkout desk

Department: Library

Activity: Reading

Users: Students

Users: 60-180

Staff: Librarian

Staff: 2

Primary Activities: This is the purpose for which the library is designed for. Is is the reading of the many books in the library.

Secondary Activities: Writing, Socializing.

Time Duration: Three hours a day or during another class

Nature: Instructional, social, recreational

Noise:Low

Activity level:Low

Equipment Requirements: Lots of books

Adjancies: Checkout, computers

Space Requirements: Lots of book shelves in a large open area called a library.

Department: Library

Activity: Research

Users: Students

Users: 30-180

Staff: Libr/Teach

Staff: 1/1

Primary Activities: Students making full use of the libraries facilities to research a subject. This involves the Librarians and the teachers help for the students.

Secondary Activities: Reading, writing, browsing.

Time Duration: One or two classes a day

Nature: Instructional, research,work.

Noise: Low

Activity level: Medium

Equipment Requirements: Lots of tables and chairs.

Adjancies: Library checkout, computers.

Space Requirements: The main library

Department: Math/ Sciences

Activity: Biology

Users: Students

Users: 30

Staff: Teacher

Staff: 1

Primary Activities: The elements of life on the planet earth. biological sciences to be taught on the 7th grade level.

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional

Noise: Low

Activity level: Low

Equipment Requirements:

Adjancies:

Space Requirements: Classroom, and storage

Department: Math/ Sciences

Activity: Computer

Users: Students

Staff: Teacher

Users: 30

Staff: 1

Primary Activities: The teaching of computer sciences.
This includes basic programing, word processing, and spreadsheets.

Secondary Activities: Typing, reading

Time Duration:One class period a day

Nature: Instructional

Noise: Low

Activity level:Low

Equipment Requirements: 30 computers

Adjancies:

Space Requirements: Classroom

Department: Math/ Sciences

Activity: Earth Sc.

Users: Students

Users: 30

Staff: Teacher

Staff: 1

Primary Activities: Learning about the planet earth. From a geological and natural perspective. A Understanding of the man made environment should also be taught.

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional, Investigational

Noise: Low

Activity level: Low

Equipment Requirements:

Adjancies:

Space Requirements: Classroom

Department: Math/ Sciences

Activity: Math

Users: Students

Users: 30

Staff: Teacher

Staff: 1

Primary Activities: This as the progressive math courses. It begins with basic math and continues through to algebra.

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional

Noise: Low

Activity level: Low

Equipment Requirements:

Adjancies:

Space Requirements: Classroom

Department: Math/ Sciences

Activity: Physical

Users: Students

Users: 30

Staff: Teacher

Staff: 1

Primary Activities: This is the basic physics and chemistry class for the students. It is combined to give the students a general understanding of how the world and universe works.

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional, Investigational

Noise: Low

Activity level: Low - Medium

Equipment Requirements: Physics, chemistry, and astronomy

Adjancies:

Space Requirements: Classroom and storage

Department: Maintenance

Activity: Cleaning

Users:

Users:

Staff: Custodians

Staff: 4

Primary Activities: This is the constant cleaning of the building. Some of the functional occur all day long, and some of the noisy of the cleaning only after normal school hours.

Secondary Activities:

Time Duration: All day long

Nature: Work

Noise: Low to medium

Activity level: High

Equipment Requirements: All cleaning equipment

Adjancies:

Space Requirements: Janitors closets at strategic locations and a main office area.

Department: Maintenance

Activity: Repairing

Users:

Users:

Staff: Custodians

Staff: 2

Primary Activities: This is the maintenance of the school structure itself. It ranges from repairing broken furniture to damage to the school itself.

Secondary Activities:

Time Duration: All day long

Nature: Work

Noise: Low to medium

Activity level: High

Equipment Requirements: All cleaning equipment

Adjancies:

Space Requirements: Use of the school shop areas.

Department: Maintenance

Activity: Gardening

Users:

Users:

Staff: Custodians

Staff: 2

Primary Activities: The maintenance of the grounds and whole campus of the school. Including Mowing, Gardening, and Cleaning.

Secondary Activities:

Time Duration: All day long

Nature: Work

Noise: Low to medium

Activity level: High

Equipment Requirements: All cleaning equipment

Adjancies:

Space Requirements: Exterior storage

Department: Music

Activity: Band

Users: Students

Users: 30-60

Staff: Instructor

Staff: 2

Primary Activities: Teaching the students how to play their chosen musical wind instruments

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional

Noise: High

Activity level: High

Equipment Requirements: Musical equipment

Adjancies: Instrument storage, practice rooms

Space Requirements: band hall, practice rooms and instrument storage

Department: Music

Activity: Orchestra

Users: Students

Users: 30-60

Staff: Instructor

Staff: 2

Primary Activities: Teaching the students how to play their chosen musical string instruments

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional

Noise: High

Activity level: High

Equipment Requirements: Musical equipment

Adjancies: Instrument storage, practice rooms

Space Requirements: Playing hall, practice rooms, and instrument storage

Department: Music

Activity: Choir

Users: Students

Users: 30-60

Staff: Instructor

Staff: 2

Primary Activities: Teaching the students how to use their voices in unison to produce a pleasing noise.

Secondary Activities:

Time Duration: One class period a day

Nature: Instructional

Noise: High

Activity level: High

Equipment Requirements: Musical equipment

Adjancies: Storage

Space Requirements: Choir hall

Department: Physical Education Activity: Volley Ball

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: The sport of volleyball

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements: volleyball net and ball

Adjancies:

Space Requirements: volleyball field

Department: Physical Education Activity: Soccer

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: The sport of soccer

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements: soccer ball

Adjancies:

Space Requirements: Soccer field

Department: Physical Education Activity:Softball

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: The sport of softball

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements:

Adjancies:

Space Requirements: Baseball field

Department: Physical Education Activity:Baseball

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: The sport of baseball

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements:

Adjancies:

Space Requirements: Baseball field

Department: Physical Education Activity:Basketball

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: The sport of basketball

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements:

Adjancies:

Space Requirements: Basketball court

Department: Physical Education Activity:Weights

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: Lifting weights to improve muscular fitness

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements: Weight sets

Adjancies:

Space Requirements: Weight room

Department: Physical Education Activity: Track

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: Running track

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements:

Adjancies:

Space Requirements: Track field

Department: Physical Education Activity: Tennis

Users: Students
Users: 60-90

Staff: Coach
Staff:

Primary Activities: The sport of tennis

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements:

Adjancies:

Space Requirements: Tennis court

Department: Physical Education Activity: Gymnastics

Users: Students
Users: 60-90

Staff: Coach
Staff: 4

Primary Activities: Indoor gymnastics

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements: Gymnastics equipment

Adjancies:

Space Requirements: Gymnasium

Department: Physical Education Activity:Changing

Users: Students
Users: 60-90

Staff: Coach
Staff: 2

Primary Activities: Changing clothes before and after gym classes. Showering after gym classes.

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, Instructional, Recreational

Noise: High

Activity level: High

Equipment Requirements: Lockers

Adjancies: showers, bathroom, and coaches office

Space Requirements: Gym locker room, showers, restrooms, coaches offices.

Department: Shop

Activity:Drafting

Users: Students
Users: 30

Staff: Teacher
Staff: 1

Primary Activities: Teaching the students how to draft in an engineering methodology. This can be expanded into an achitectural fields also.

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, instructional, social

Noise: Low

Activity level: Low

Equipment Requirements: Drafting Equipment

Adjancies: office and storage

Space Requirements: Large shop with storage and office

Department: Shop

Activity: Wood Shop

Users: Students
Users: 30

Staff: Teacher
Staff: 1

Primary Activities: Learning how to work with wood.
Learning how to use all the machines that are in a wood shop.

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, instructional, social

Noise: High

Activity level: High

Equipment Requirements: Shop Equipment

Adjancies: office and storage

Space Requirements: Large shop with storage and office

Department: Shop

Activity: Metal Shop

Users: Students
Users: 30

Staff: Teacher
Staff: 1

Primary Activities: Learning how to work with metal.
Learning how to use all the machines that are in a metal shop.

Secondary Activities:

Time Duration: One class period a day

Nature: Physical, instructional, social

Noise: High

Activity level: High

Equipment Requirements: Shop Equipment

Adjancies: office and storage

Space Requirements: Large shop with storage and office

Department:Extra Curricular

Activity:Socializing

Users: Students

Users: All

Staff: All

Staff: All

Primary Activities: this is the constant interaction between all staff of the school and the students. All groups interact with all other groups during the course if the school day and after.

Secondary Activities:

Time Duration: All day long

Nature: Social

Noise: Low to High

Activity level: Low to high

Equipment Requirements:

Adjancies:

Space Requirements: No more than are already present in the previous described activities.

Department:Extra Curricular Activity:Sports

Users: Students
Users: Any

Staff: Any
Staff: Any

Primary Activities: This is the after school UIL sports.

Secondary Activities:

Time Duration: After school

Nature: Social

Noise: High

Activity level: high

Equipment Requirements: Any required by sport

Adjancies:

Space Requirements: No more than are already present in the previous described activities.

SPACE SUMMARY

SPACE SUMMARY

NAME	Number PEOPLE	S/F Per PERSON	Number SPACES	Total S/F
Admin Area				
Principals Office	1	150	1	150
Vice Prin. Office	1	150	1	150
Attendance Office	4	50	1	200
Reception	2	120	1	240
Conference	15	20	1	300
Councilors Office	1	120	3	360
Councilors Reception	6	50	1	300
Storage Closet	0	0	3	10
Nurses Office	1	100	1	100
Men's restroom			1	150
Women's restroom			1	150
Art				
Classroom	30	25	3	2250
Storage Room			3	30
Kiln room			1	150
Cafeteria				
cafeteria	400	15	1	6000
Men's restroom			1	180
Women's restroom			1	180
Serving Line	20	6	2	240
Kitchen	8	175	1	1400
Cold Storage			1	100
Dry Storage			2	200
Dishwasher	2	105	1	210
Library				
Library	90	35	1	3150
Library office	2	120	1	240
Home Economics				
Food Lab	30	45	1	1350
Day Care Lab	15	45	1	675
Classroom	30	25	1	750
Storage room			1	80
Humanities				
Classrooms English	30	25	6	4500
Classrooms Foreign Lang.	30	25	6	4500
Classrooms Health	30	25	3	2250
Math and Science				
Classrooms Math	30	25	6	4500
Classrooms Science	30	25	6	4500
Computer Labs	30	45	3	4050

SPACE SUMMARY

NAME	Number PEOPLE	S/F Per PERSON	Number SPACES	Total S/f
Music				
Band room	200	30	1	6000
Practice rooms	2	15	3	90
Instrument Storage			2	800
Storage			1	100
Office	1	120	1	120
Orchestra room	100	30	1	3000
Practice rooms	2	15	2	60
Instrument room			1	400
Storage			1	60
Choir room	300	10	1	3000
Storage			1	60
P. E.				
Gym 50x86	1200	35	1	4300
Girls Locker	100	13	1	1300
Girls restroom			1	150
Girls shower			1	100
Girls dressing	50	10	1	500
Girls Coaches Office	1	120	2	240
Boys Locker	100	13	3	3900
Boys restroom			1	150
Boys Shower			1	100
Boys dressing	50	10	2	500
Boys Coaches Offices	1	120	2	240
Playing Fields			6	
Extra Curricular Activities				
Locker commons w/ 900 lockers total	300	6	3	4500
Student Toilets M&F			2	200
Teachers Workroom	10	50	1	500
Teachers Lounge	10	35	2	750

Detailed Space List

TITLE SHEET

Department: Administration Space: Principal Office

Users Definition: The Principal of the school
Number: 1 Office
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION

Lighting: Natural from windows to artificial

Views: Of the rest of the school

Acoustics: For Privacy

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION

Outlets: Y Telephone: Y Clock: N P/A: Y

Computer: Y Intercom: Y Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Vice Prin. Office

Users Definition: The Vice Prin. Office
Number: 1 Office
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural from windows to artificial

Views: Of the rest of the school

Acoustics: For privacy

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: N P/A: Y

Computer: Y Intercom: Y Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Attandance Office

Users Definition: The people who keep attendance
Number: 1 Office
Seated / Standing: Both
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: Of main entrance

Acoustics: No special

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: Y Intercom: Y Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Reception

Users Definition: Office Secretary
Number: 1 Room
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: Of commons

Acoustics: No special

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: Y Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Conference

Users Definition: Any people who need it.
Number: 1 Conference
Seated / Standing: Seated
Activity Level: N/A

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: No special

Acoustics: For Privacy

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: N P/A: Y

Computer: N Intercom: Y Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Counselors

Users Definition: The school counselors
Number: 3 Office
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural from windows and artificial

Views: None

Acoustics: For privacy

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: Y Intercom: Y Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Counsellors Recp..

Users Definition: Receptionist and any student waiting
Number: 1 Room
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: Y Intercom: Y Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Storage

Users Definition: None
Number: 1 Room
Seated / Standing: N/A
Activity Level: N/A

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Nurses Office

Users Definition: The school nurse
Number: 1 Office
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: For privacy

Temperature: Lower than normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: N Intercom: Y Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Men's Restroom

Users Definition: The male staff
Number: 1 Restroom
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Administration Space: Ladies Restroom

Users Definition: The female staff
Number: 1 Restroom
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Art

Space: Classroom

Users Definition: Students in art
Number: 3 Classrooms
Seated / Standing: Both
Activity Level: Medium

ARCHITECTURAL DEFINITION

Lighting: Natural

Views: None

Acoustics: Noise reduction

Temperature: Normal

Special requirements: Connection to storage area

MECHANICAL DEFINITION

A/C: Y Odors: N Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Art

Space: Storage Room

Users Definition: The students
Number: 3 Rooms
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: N

Water Faucets: N Drainage: N Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Art

Space: Kiln Room

Users Definition: Art teacher
Number: 1 Room
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION

Lighting: Natural

Views: None

Acoustics: None

Temperature: Extra cooling required

Special requirements:

MECHANICAL DEFINITION

A/C: Y | Odors: Y | Fixtures: N

Water Faucets: Y | Drainage: Y | Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets: Y | Telephone: N | Clock: N | P/A: Y

Computer: N | Intercom: N | Special Power: Y

Special requirements: For kiln

NOTES:

Department: Cafeteria Space: Cafeteria

Users Definition: Students
Number: 1 Cafeteria
Seated / Standing: Seated
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Natural and Artificial

Views: Some exterior

Acoustics: Noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: N

Water Faucets: N Drainage: N Exhaust: Y
Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Cafeteria Space: Men's Restroom

Users Definition: Male Students
Number: 1 Restroom
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: Y	Fixtures: Y
Water Faucets: Y	Drainage: Y	Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets: N	Telephone: N	Clock: N	P/A: Y
Computer: N	Intercom: N	Special Power: N	

Special requirements:

NOTES:

Department: Cafeteria Space: Women's Restroom

Users Definition: Female students
Number: 1 Restroom
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature:

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Cafeteria Space: Serving Line

Users Definition: Students
Number: 2 Lines
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Extra

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: Y

Special requirements: For food warming

NOTES:

Department: Cafeteria Space: Kitchen

Users Definition: Kitchen staff
Number: 1 Kitchen
Seated / Standing: Standing
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Extra cooling

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: Y

Special requirements:

NOTES:

Department: Cafeteria Space: Cold Storage

Users Definition: Kitchen staff
Number: 1 Room
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Refrigeration

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements: Refrigeration

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: Y

Special requirements: For Refrigeration

NOTES:

Department: Cafeteria Space: Dishwasher Room

Users Definition: Kitchen staff
Number: 1 Room
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: Low

Acoustics: Low

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: Y	Fixtures: N
Water Faucets: Y	Drainage: Y	Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets:	N	Telephone: N	Clock: N	P/A: Y
Computer: N	Intercom:	N	Special Power: Y	

Special requirements: For industrial dishwasher

NOTES:

Department: Cafeteria Space: Dry Space

Users Definition: Kitchen Staff
Number: 2 Rooms
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES: Walk in closet.

Department: Home Economics Space: Food Lab

Users Definition: Students
Number: 1 Lab
Seated / Standing: Standing
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: N

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: Y

Special requirements: Household Kitchen Equipment

NOTES: Several independent kitchen

Department: Home Economics Space: Day Care Lab

Users Definition: Students
Number: 1 Lab
Seated / Standing: Both
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting:

Views: None

Acoustics: For noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: N

Water Faucets: Y Drainage: N Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: Y Special Power: N

Special requirements:

NOTES: School Day Care

Department: Home Economics Space: Classroom

Users Definition: Students
Number: 30
Seated / Standing:
Activity Level:

ARCHITECTURAL DEFINITION
Lighting: Natural and Artificial

Views: None

Acoustics: Sound reduction

Temperature: normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Home Economics Space: Storage Room

Users Definition: Teacher
Number: 1 Room
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES: Food Storage

Department: Humanities Space: English Class

Users Definition: Students
Number: 6 Class rooms
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural to Artificial

Views: None

Acoustics: Noise Reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Humanities Space: Foreignlaq Class

Users Definition: Students
Number: 6 Class rooms
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural to Artificial

Views: None

Acoustics: Noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Humanities

Space: Health Class

Users Definition: Students
Number: 3 Class room
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural to Artificial

Views: None

Acoustics: Noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Math and Sciences Space: Math Class Room

Users Definition: Students
Number: 6 Class rooms
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural to Artificial

Views: None

Acoustics: Noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Math and Sciences Space: Science Class Room

Users Definition: Students
Number: 6 Class rooms
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural to Artificial

Views: None

Acoustics: Noise reduce

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Math and Sciences Space: Computer Labs

Users Definition: Students
Number: 3 Labs
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural to Artificial

Views: None

Acoustics: Noise reduce

Temperature: Cooler than normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: Y Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Band Room

Users Definition: Students
Number: 1 Room
Seated / Standing: Seated
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: Sound reduce

Temperature: Normal

Special requirements: Acoustics for band room

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Practice Room

Users Definition: Students
Number: 3 Rooms
Seated / Standing: Seated
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: Isolation

Temperature: Normal

Special requirements: Isolate each room acoustically

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: N P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Instrument Storage

Users Definition: Students
Number: 2 Rooms
Seated / Standing: N/A
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: N	Fixtures: N
Water Faucets: N	Drainage: N	Exhaust: N

Special requirements:

ELECTRICAL DEFINITION

Outlets:	N	Telephone: N	Clock: N	P/A: Y
Computer: N	Intercom:	N	Special Power: N	

Special requirements:

NOTES:

Department: Music

Space: Orchestra Room

Users Definition: Students
Number: 1 Room
Seated / Standing: Seated
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: Noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Office

Users Definition: Band Leader
Number: 1 Office
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: Of band room

Acoustics: Isolation

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: N P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Storage

Users Definition: Stuff
Number: 1 Space
Seated / Standing: N/A
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Office

Users Definition: Band Leader
Number: 1 Office
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: Of band room

Acoustics: Isolation

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: N P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Orchestra Room

Users Definition: Students
Number: 1 Room
Seated / Standing: Seated
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: Noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Practice Rooms

Users Definition: Students
Number: 2 Rooms
Seated / Standing: Seated
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: Noise isolation

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: N P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Instrument Storage

Users Definition: Students
Number: 1 Room
Seated / Standing: N/A
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Storage

Users Definition: Stuff
Number: 1
Seated / Standing: N/A
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Choir Room

Users Definition: Students
Number: 1 Room
Seated / Standing: Both
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: Noise reduction

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Music

Space: Storage

Users Definition: Stuff
Number: 1 Room
Seated / Standing: N/A
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Physical Education Space: GYM

Users Definition: Students
Number: 1 GYM
Seated / Standing: Standing
Activity Level: High

ARCHITECTURAL DEFINITION
Lighting: Natural to artificial

Views: None

Acoustics: Limited

Temperature: Extra cooling

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: N

Water Faucets: N Drainage: N Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Physical Education Space: Girls Locker Room

Users Definition: Female Students
Number: 1 Room
Seated / Standing: Both
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: Y	Fixtures: N
Water Faucets: N	Drainage: N	Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets:	Y	Telephone: N		Clock: Y		P/A: Y	
Computer: N	Intercom:		N	Special Power: N			

Special requirements:

NOTES:

Department: Physical Education Space: Girls Restroom

Users Definition: Female Students
Number: 1 Restroom
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: Y	Fixtures: Y
Water Faucets: Y	Drainage: Y	Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets: Y	Telephone: N	Clock: N	P/A: Y
Computer: N	Intercom: N	Special Power: N	

Special requirements:

NOTES:

Department: Physical Education Space: Girls Dressing

Users Definition: Female Students
Number: 1 Room
Seated / Standing: Both
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: Y	Fixtures: N
Water Faucets: N	Drainage: N	Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets:	Y	Telephone: N	Clock: Y	P/A: Y
Computer: N	Intercom:	N	Special Power: N	

Special requirements:

NOTES:

Department: Physical Education Space: Girls Shower

Users Definition: Female Students
Number: 1 Space
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: None

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Physical Education Space: Girls Coaches Off.

Users Definition: Female Coaches
Number: 2 Offices
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: N	Fixtures: N
Water Faucets: N	Drainage: N	Exhaust: N

Special requirements:

ELECTRICAL DEFINITION

Outlets:	Y	Telephone: Y	Clock: N	P/A: Y
Computer: N	Intercom:	N	Special Power: N	

Special requirements:

NOTES:

Department: Physical Education Space: Boys Locker Rooms

Users Definition: Male Student
Number: 3 Rooms
Seated / Standing: Both
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: Girls Showers

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: N

Water Faucets: N Drainage: N Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Physical Education Space: Boys Rest Rooms

Users Definition: Male Students
Number: 1 Room
Seated / Standing: Seated
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Physical Education Space: Boys Showers

Users Definition: Male Students
Number: 1
Seated / Standing: Standing
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

Department: Physical Education Space: Boys Dressing Room

Users Definition: Male Students
Number: 2 Room
Seated / Standing: Both
Activity Level: Medium

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: Y	Fixtures: N
Water Faucets: N	Drainage: N	Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION

Outlets: Y	Telephone: N	Clock: Y	P/A: Y
Computer: N	Intercom: N	Special Power: N	

Special requirements:

NOTES:

Department: Physical Education Space: Boys Coaches off.

Users Definition: Male Coaches
Number: 2 Offices
Seated / Standing: Seated
Activity Level:

ARCHITECTURAL DEFINITION
Lighting: Artificial

Views: None

Acoustics: None

Temperature: Normal

Special requirements:

MECHANICAL DEFINITION

A/C: Y	Odors: N	Fixtures: N
Water Faucets: N	Drainage: N	Exhaust: N

Special requirements:

ELECTRICAL DEFINITION

Outlets:	Y	Telephone: Y	Clock: N	P/A: Y
Computer: N	Intercom:	N	Special Power: N	

Special requirements:

NOTES:

Department: Physical Education Space: Playing Fields

Users Definition: Students
Number: 6 Fields
Seated / Standing: Both
Activity Level: High

ARCHITECTURAL DEFINITION
Lighting: Natural

Views: Of the other fields

Acoustics: Natural

Temperature: Natural

Special requirements:

MECHANICAL DEFINITION
A/C: N Odors: N Fixtures: N

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: N P/A: N

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES: These are the outside playing fields

Department: Extra curricular Space: Teachers Lounge

Users Definition: Teachers
Number: 1
Seated / Standing: Both
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural and artificial

Views: Yes

Acoustics: For noise reduction

Temperature: normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: Y Drainage: Y Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: Y Intercom: Y Special Power: N

Special requirements:

NOTES: A room for the Teachers to prepare for class

Department: Extra curricular Space: Teachers Work room

Users Definition:
Number:
Seated / Standing:
Activity Level:

ARCHITECTURAL DEFINITION
Lighting:

Views:

Acoustics:

Temperature:

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: Y Fixtures: Y

Water Faucets: Y Drainage: Y Exhaust: Y

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: Y Intercom: Y Special Power: Y

Special requirements:

NOTES:

Department: Extra curricular Space: Teachers Lounge

Users Definition: Teachers
Number: 2
Seated / Standing: Both
Activity Level: Low

ARCHITECTURAL DEFINITION
Lighting: Natural and artificial

Views: Yes

Acoustics: For noise reduction

Temperature: normal

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: N

Water Faucets: Y Drainage: Y Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: Y Telephone: Y Clock: Y P/A: Y

Computer: N Intercom: Y Special Power: N

Special requirements:

NOTES: A room for the Teachers to relax and interact

Department: Extra curricular Space: Commons

Users Definition: Students
Number: 3 Rooms
Seated / Standing: Standing
Activity Level: High

ARCHITECTURAL DEFINITION
Lighting: Natural and Artificial

Views:

Acoustics:

Temperature:

Special requirements:

MECHANICAL DEFINITION
A/C: Y Odors: N Fixtures: Y

Water Faucets: N Drainage: N Exhaust: N

Special requirements:

ELECTRICAL DEFINITION
Outlets: N Telephone: N Clock: Y P/A: Y

Computer: N Intercom: N Special Power: N

Special requirements:

NOTES:

SYSTEMS PERFORMANCE CRITERIA

SYSTEMS PERFORMANCE CRITERIA

The information in the case studies and one book in the bibliography contain more than enough information for the performance of the various systems of this school. The Book Energy Efficient School Design, contains more information in one place than half the books in the main library put together. The information in specialized for designing a school. With this tool for my design the work of finding this information seems less important. Since to reproduce the information here would only serve to waste paper.

ECONOMIC COST ANALYSIS

ECONOMIC COST ANALYSIS

5

#	System Component	Specifications	Unit	Unit Cost	Cost per S
1.0	Foundations				
.1	Footings & Found.	Poured conc.	S.F. grnd.	2.24	1.12
.9	Excavation & bkfl	Site Prep.	S.F. grnd.	.60	.30
2.0	Substructure				
.1	Slab on Grade	4" Reinf. conc.	S.F. grnd.	2.22	1.11
3.0	Superstructure				
.1	Columns & Beams	Fireproofing stl	L.F. COl.	13.52	.19
.5	Elevated floors	Open web Joust..	S.F. Floor	8.87	4.44
.7	Roof	Metaldeck, col.	S.F.Roof	3.37	1.89
.9	Stairs	Concrete	Flight	3770	.21
4.0	Exterior Closure				
.1	Walls	Face Brick 75%	S.F. Wall	11.74	3.63
.6	Doors	Dbl Alum& Glass	Each	1060	.28
.7	Windows	Window 25%	S.F. Windw	19.57	2.01
5.0	Roofing				
.1	Roof	Built Up	S.F.Roof	1.46	.73
.7	Insulation	Composite	S.F.Roof	.99	.50
.8	Openings & Spec.	Openings	S.F.Roof	.99	.50
6.0	Interior Construction				
.1	Partitions	CMU	S.F.Part	3.65	2.06
.4	Interior Doors	Fire Doors	Each	4.29	.57
.5	Wall Finishes	Paint Etc.	S.F. Sruf	1.01	1.01
.6	Floor Finishes	Tile Etc.	S.F. Floor	3.43	3.43
.7	Ceiling Finishes	Fiberboard	S.F. Ceilg	3.11	3.11
.9	Interior Surf	Painted Gypsum	S.F. Wall	1.94	.60
7.0	Conveying				
.1	Elevators	One Passenger	Each	42125	.38
8.0	Mechanical				
.1	Pluming	Fixtures	Each	1685	.44
.2	Fire Protection	Sprinklers	S.F. Floor	.15	.15
.3	Heat & Cooling	HVAC	S.F. Floor	8.10	8.10
9.0	Electrical				
.1	Service and Dist.	800 Amp svc.	S.F. Floor	.24	.24
.2	Lighting and Pwr	Lights& Outlets	S.F. Floor	3.72	3.72
.4	Special Electricl	Alarm etc.	S.F. Floor	1.26	1.26
10.0	Special Construction				
.1	Specialties	Chalkboards etc.	S.F. Floor	.58	.58
			Sub Total		34.16
General Conditions			15%		6.47
Architect Fees			7%		3.47
			Total Cost		53.10

Case Studies

Case Study 1

Project Name: Texas Southmost College Campus

Location: Brownsville, Tx

Architect: Marmon Barclay Souter Foster Hayes. San Antonio

Describe Project in Terms Of Program: The program is for fourteen renovation and construction projects. The masterplan is for the preservation of 1860 era structures, to make the campus work more efficiently, and to accommodate for the future growth of the campus. A larger objective is to create an image of an academic institution

Describe Project in Terms Of Design: The architects developed a element design vocabulary drawing from the historic buildings on campus. This element vocabulary, although drawing on historic elements, they were in modern materials.

Describe Project in Terms Of Construction Methods, Materials, And Technologies: The restoration or renovation of the existing buildings are done in new materials. The Major problem was roof, they were replaced with metal roof. The Metal roof are longer lasting, more resistant to leaks, and easier to maintain. The new buildings use brick walls with banding to connect with existing buildings.

Personal Comments, Critiques, or Observations: The colors and subtleness of the improvements on the campus are the major plusses. The metal roof are not as visually strong as I thought it would be. The amount of paving on the ground is a bad point. The grass to me is more important than brick pavers. I really like the two levels of pedestrian traffic in the pictures really impressed my, the climate of the region make an enclosed walkway an attractive option.

RETHINKING TEXAS SOUTHMOST

By Joel Warren Barna

PROJECT [illegible]

CLIENT [illegible]

ARCHITECT Marmon Barclay Souter Foster Hays, San Antonio [illegible]

CONSULTANTS [illegible]

CONTRACTORS [illegible]

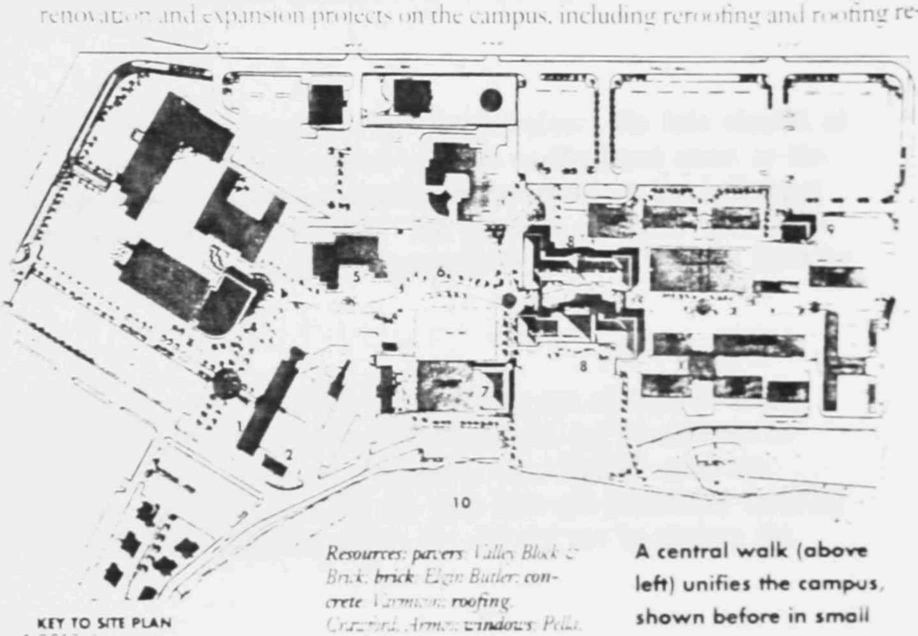
PHOTOGRAPHER [illegible]

THE SAN ANTONIO FIRM Marmon Barclay Souter Foster Hays was hired in 1987 as coordinating architect and engineer for a program of construction projects on the campus of Texas Southmost College, a community college in Brownsville. The campus included 1860s structures from Fort Brown, many badly in need of repair, as well as poorly coordinated newer buildings. In designing a master plan for 14 recently funded renovation and construction projects and for future growth on the campus, MBSFH aimed to accommodate a fast-growing enrollment, to make the campus work more efficiently, and to create an image befitting the institution's academic mission.

Drawing on elements from the campus's historic buildings, MBSFH developed a guiding design vocabulary. Elements to be used included gabled or hipped metal roofs, extended pediments, cornices with brick dentils, sheet-metal rain spouts, brick walls with banding, flat and segmental arches, double-hung windows, clustered windows with cast-stone sills, glass transoms, loggias and colonnades, and sill-course banding.

MBSFH provided full architectural and engineering services for a number of the renovation and expansion projects on the campus, including reroofing and roofing repairs to the administration building (Gorgas Hall) and seven other buildings; paseo entrance and landscaping, including signage, arches, and paved walks; sitework and landscaping around the classroom/office complex and the library; and design for a new central plant. MBSFH also acted as the single firm responsible to the college for programming and schematic design for the other projects in the package, while other firms, called "project architects," were responsible for design development and other traditional services. MBSFH continued to monitor design through construction documents, bidding, and construction, and provided interior design services for the remaining projects.

Design Five Architects of Brownsville was project architect for a gymnasium addition and for renovation of the interior of the student center and Tandy Hall. Balli/Gomez & Associates of Brownsville was project architect for the two-building classroom and office complex. David Hoffman & Co. of Austin oversaw conversion of the historic commissary into the Art Building and of the old hospital into administrative offices. And Ford, Powell & Carson, Inc., of San Antonio was project architect for a library addition. **TA**



KEY TO SITE PLAN
1 [illegible]
2 [illegible]
3 [illegible]
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6 [illegible]
7 [illegible]
8 [illegible]
9 [illegible]
10 [illegible]

Resources: ***pavers*** *Valley Block & Brick;* ***brick*** *Elgin Butler;* ***concrete*** *[illegible];* ***roofing*** *Crawford, Armco;* ***windows*** *Pella, Alenco;* ***hardware*** *Schlage;* ***carpet*** *Collins & Aikman, Mohawk;* ***vinyl tile*** *Tarkett;* ***vinyl wall covering*** *Goodrich;* ***paint*** *Benjamin Moore, Tnemec;* ***ceramic tile*** *Dal Tile;* ***laminate*** *Wilsonart*

A central walk (above left) unifies the campus, shown before in small photos. Champion Hall (middle right) and the old commissary (bottom right) were guides for a new design vocabulary.

Case Study 3

Project Name: St. Mark's School of Texas

Location: Dallas, TX

Architect: Tapley/Lonow Architects, Houston

Describe Project in Terms Of Program: The campus of the school was reorganized and redesigned to connect and unify the buildings of the campus. The old Buildings as well as the new buildings, were connected with covered walkways to preserve the individuality of the buildings and preserve several informal courtyards.

Describe Project in Terms Of Design: The use of big overhangs and shaded walkways on the courtyard side served to unify the different elements of the campus. The original school building, Davis Hall, Is Reinforced ans the focus of the campus by a new entrance and orientation of the colonnaded walks. Metal roofs and tan and brown brick work serve to establish continuity in both the new and old buildings.

Describe Project in Terms Of Construction Methods, Materials, And Technologies: The Main element of the design is the covered walkways. They are either colonnaded walkways or sheltered eaves on the courtyard side if the buildings. the brick work uses varying patterns to establish the individual buildings while the colors of the bricks serve to connect them. The previous additions used "barn like forms", while the new additions use octagonal and outward projections to establish the identity of the new structures.

Personal Comments, Critiques, or Observations: The forms and shapes of the new structures are in sharp contrast to the stereotypes of religious schools. The shapes are bold and adventurous to establish very powerful form. The courtyards surrounded by colonnades or protected eaves are borrowed of an monastery. The cloister of the monastery used the same form and presumably function as the courtyards or this school. Basically the school combines the old and new to produce the modern place of knowledge.

Case Study 2

Project Name: UT Recreational Sports Center

Location: Austin, TX

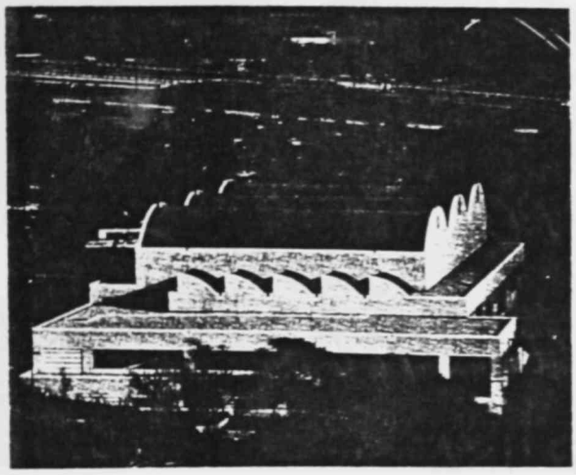
Architect: F&S Partners, Dallas

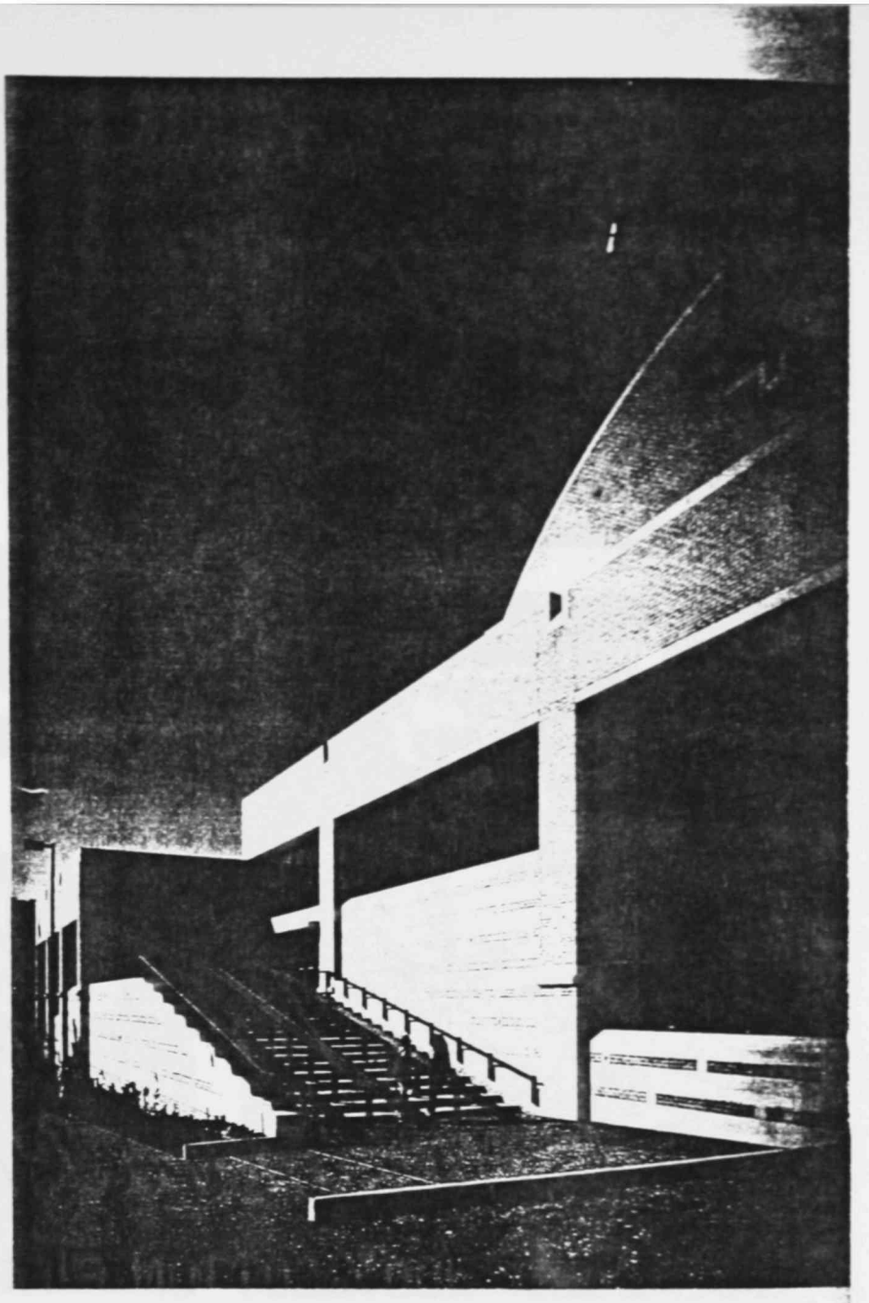
Describe Project in Terms Of Program: This is an 120,000-square-foot sports center with very heavy emphasis on using natural light. It is on an restricted site with its footprint dominated by the gym floor layout. The height if the building is further restricted by laws designed to protect views of the state Capitol. The sturdiness on the materials is a must for the high use of the building.

Describe Project in Terms Of Design: The natural lighting if building was completed using large sweeping curves, lots of glass on the west face, and a reverse clearstory windows. The windows are down inside the curve element of the roof, instead of the normal of putting it on top of the curve.

Describe Project in Terms Of Construction Methods, Materials, And Technologies: The finished of the building are very nice. They include terrazzo, glass block, carpet, and wood surfaces. The barrel vaults that are the curves on the roof are clad in copper, with the bricks and stone giving the center itself their strength.

Personal Comments, Critiques, or Observations: The lighting from the barrel vaults and reverse clearstory windows is the most powerful feature. The materials of the center, bricks and stone, visually give it the impression that it will last forever. That with the finishes allow the building to have a strength and beauty that understandably make this space one of the most popular on campus. The budget of $100-per-square-foot allowed the richness if the finishes to be realized.





THROWING CURVES, SCOOPING LIGHT

By Joel Warren Barna

Top left: The barrel-vaulted Recreational Sports Center at UT Austin is on a sloping site in a campus recreational zone.

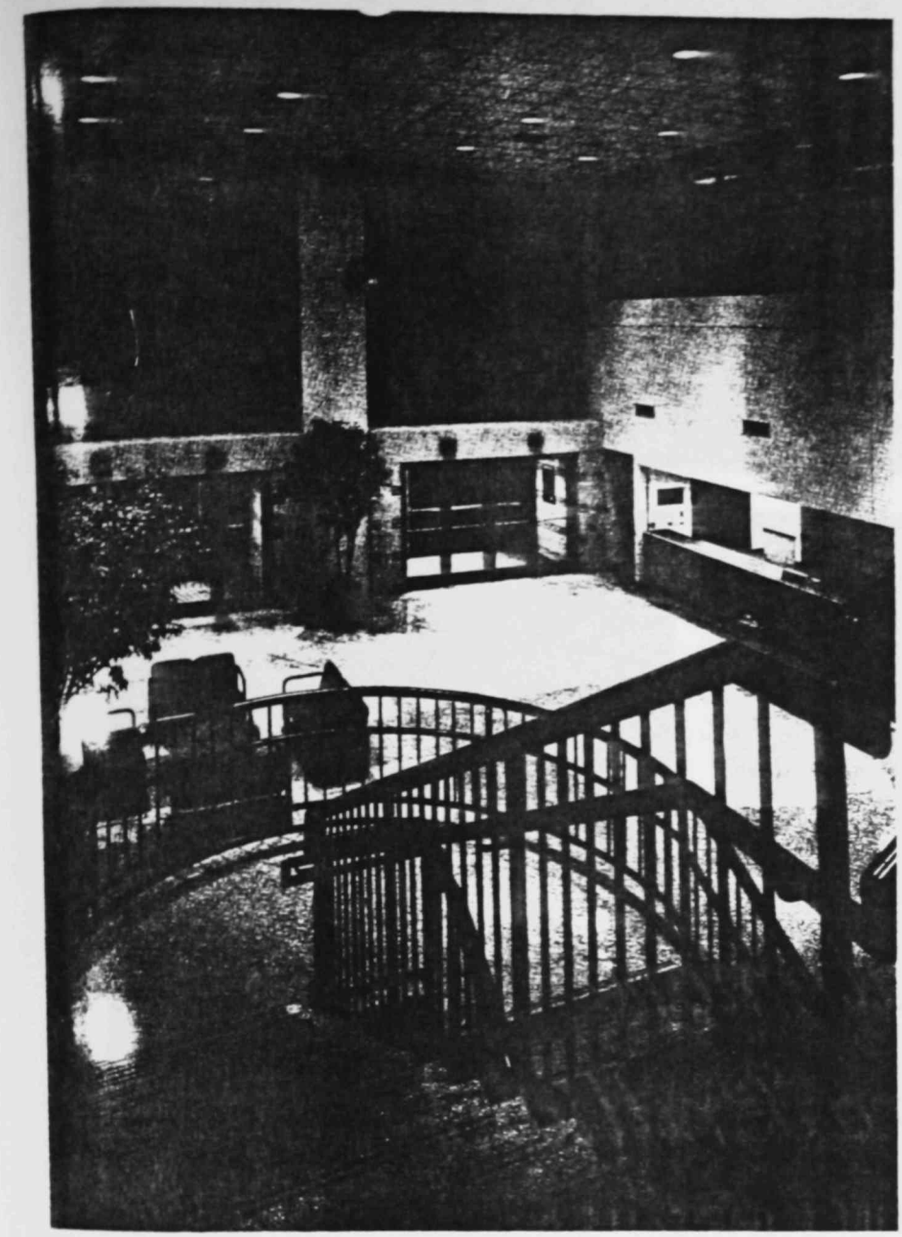
Top right: Windows on the south elevation light the interior concourse.

Bottom left: On the west, clustered support areas break down the street-facing mass.

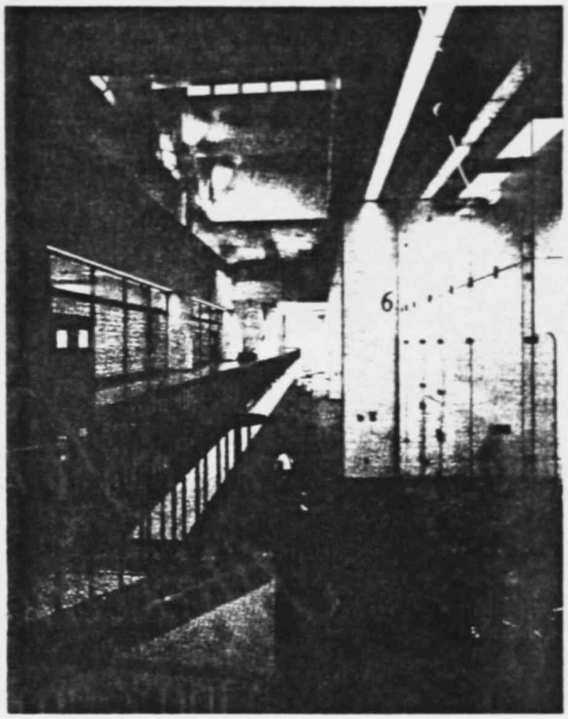
PROJECT *UT Recreational Sports Center, UT Austin*
CLIENT *The University of Texas System*
ARCHITECT *F&S Partners, Dallas (Ronald J. Shaw, principal-in-charge; Anita Piozzi Morao, project manager/designer)*
CONSULTANTS *Datum Engineering, Dallas (structural); Gaynor & Sirmen, Dallas (mechanical, electrical, plumbing, fire); Brockette-Davis-Drake, Dallas (civil); Bener Associates, Austin (acoustical); Hoffpauir Planning and Design, Austin (landscape)*
CONTRACTOR *Pepper-Lawson Construction, Houston*
PHOTOGRAPHER *Blackmon-Wintz, Kyrus*

WITH A POPULATION of over 50,000 undergraduate and graduate students, who ran among the most fitness-conscious people in a city known for its joggers, swimmer cyclers, and disc-tossing fanatics, the University of Texas at Austin had a big deman for recreational-sports facilities, primarily gymnasiums that would complement th campus's tennis courts and world-class swimming center. Bellmont Gymnasium, in th bowels of Memorial Stadium (1972, Lockwood, Andrews and Newnam), and th gable-roofed, Romanesque Gregory Gymnasium (1930, Greene, LaRoche and Dahl with its rambling additions, were all-too-well used; demand was growing at the sam time that equipment, from basketball court floorboards to free weights, was showin the strains of constant wear.

The university hired F&S Partners of Dallas to design a new 120,000-square-foo recreational sports center for a sloping site, forming a recreation hub, with Memori Stadium and the Tennis Center on the north and the University Swim Center on th south (along with a small group of academic buildings). The new recreational spor center's footprint, dictated primarily by the layout of the gymnasium on its secon

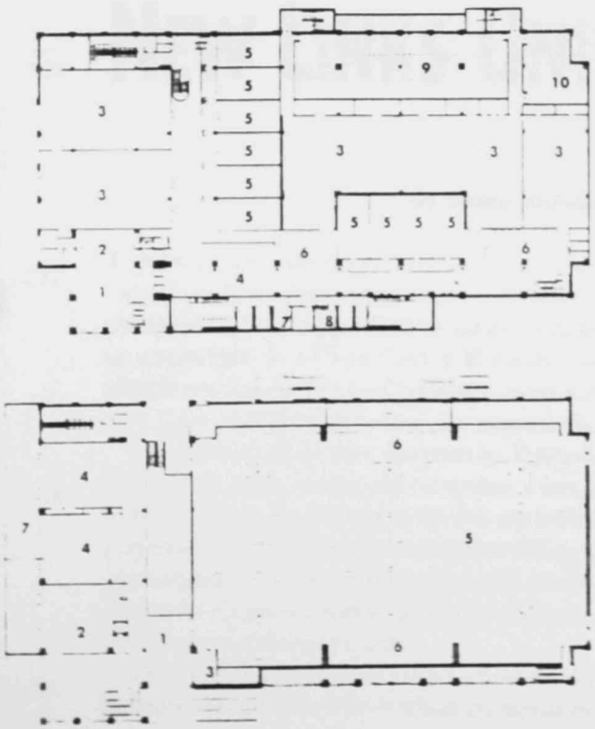


Resources: backboards, divider curtains, wall padding: *Aalco; court surface, flooring: AGA; bleachers: Hussey Seating; scoreboards: Nevco; volleyball nets and standards: Sebob, supplied by Sports Imports; glass walls: Altempco Glass; ceiling panels: Fiberesm Industries; walls: Reese Industries; stationary bicycles: Schwinn, Pro-Tec Sports, Life Fitness; rowers: Concept II; stepclimbers: Randalsports/Medical Products, Life Fitness; stacked/machine weights: Cybex Fitness ; free weights: Samson Equipment, Cybex Strength ; flooring, Milliken Contract Carpets, American Olean; Lockers, Republic Storage*



floor, was restricted by streets, storm sewers, and tunnels for thermal and electrical equipment serving other buildings. The center's western facade was additionally restricted by height limits designed to protect views of the Texas Capitol, to the southwest.

The architects responded to this site and a $100-per-square-foot budget by creating a building whose ample volumes play off the angularity of the football stadium and the gym center. The most striking parts of the center are its barrel vaults, clad in copper and split by north-south clerestories. Below them, the center presents itself to the city as a mass of strongly detailed brick and concrete accented with deeply modeled cast stone. On the western facade, offices and support spaces massed around the gym break down the scale facing the street, while the south side is faced in glass in gridded mullions, which admits light into the lower-level circulation spaces leading to the center's racquetball/handball courts, weight rooms, and aerobics studios. The interior, finished in carpet, wood, glass block, and terrazzo, is organized around two concourses, with lounge spaces and various activity areas. The center has become one of the more popular buildings on campus. **TA**

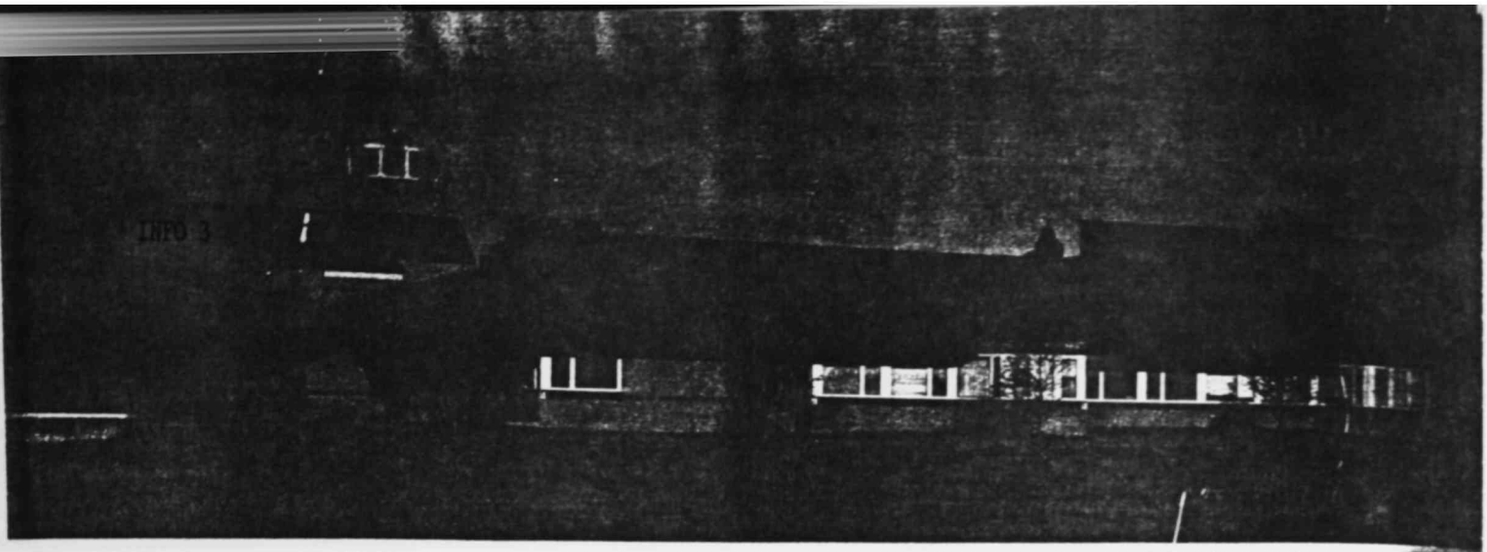


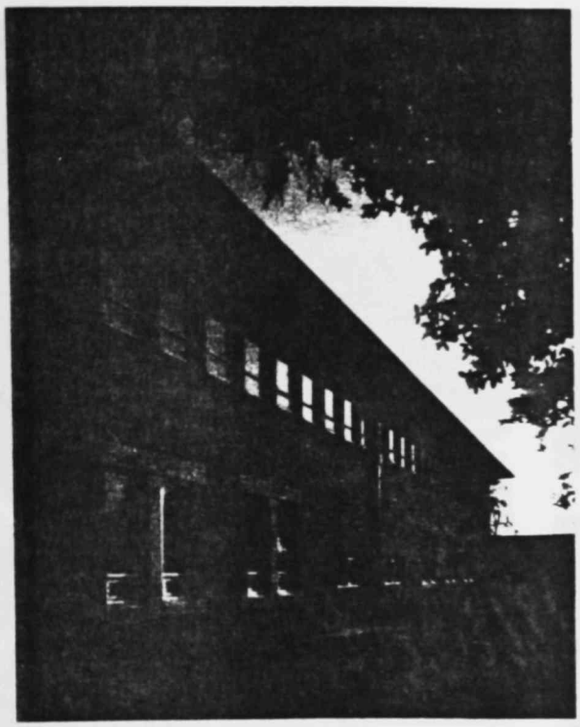
Concourse (above), daylit by clerestories, and two-story entry volume (above left) form easy circulation.

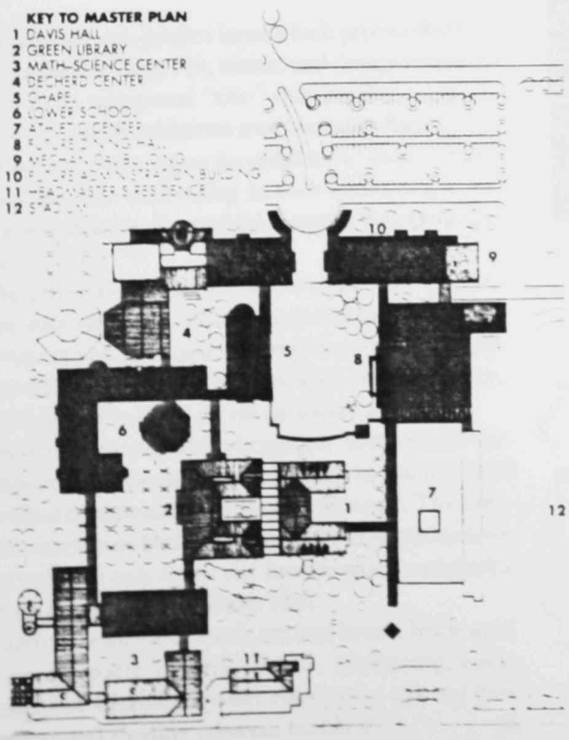
Top right: section through barrel vaults and clerestories

KEY TO FIRST-FLOOR PLAN
1 LOBBY
2 DESK
3 MULTIPURPOSE
4 CONCOURSE
5 HANDBALL COURT
6 LOUNGE
7 WOMEN'S LOCKER
8 MEN'S LOCKER
9 MECHANICAL
10 ELECTRICAL

KEY TO SECOND-FLOOR PLAN
1 CONCOURSE
2 GAME ROOM
3 HANDBALL
4 MULTIPURPOSE
5 GYMNASIUM
6 PORTABLE BLEACHERS
7 TERRACE







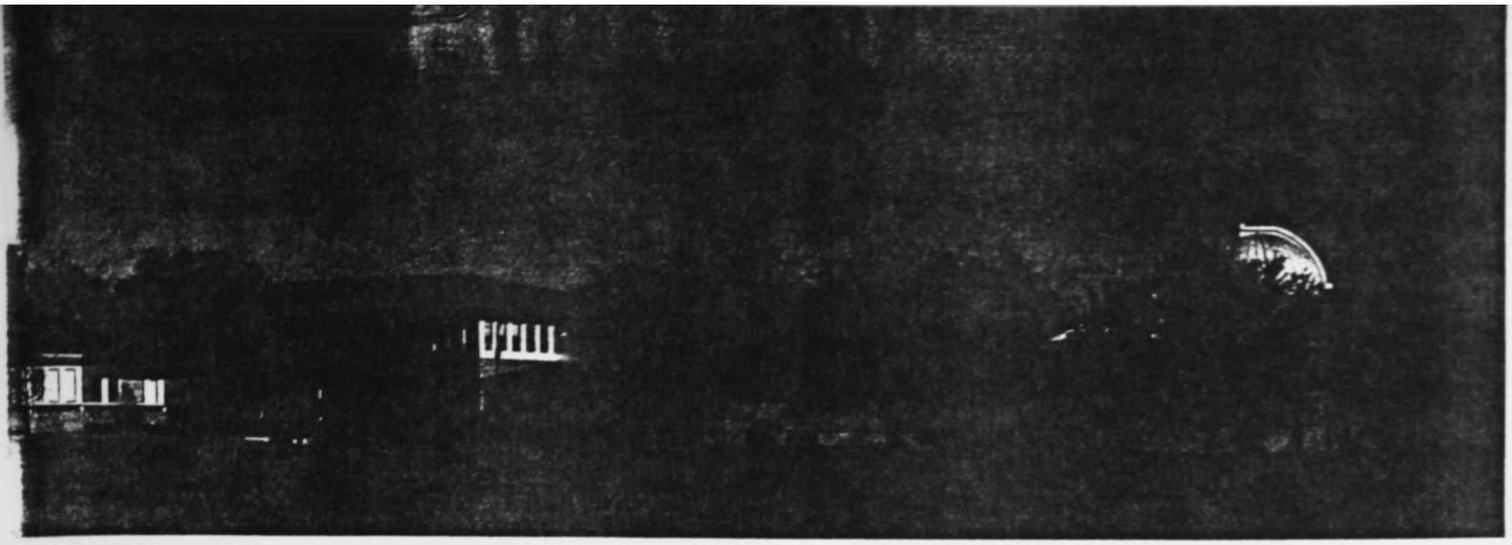
NEW LINKS UNIFY CAMPUS

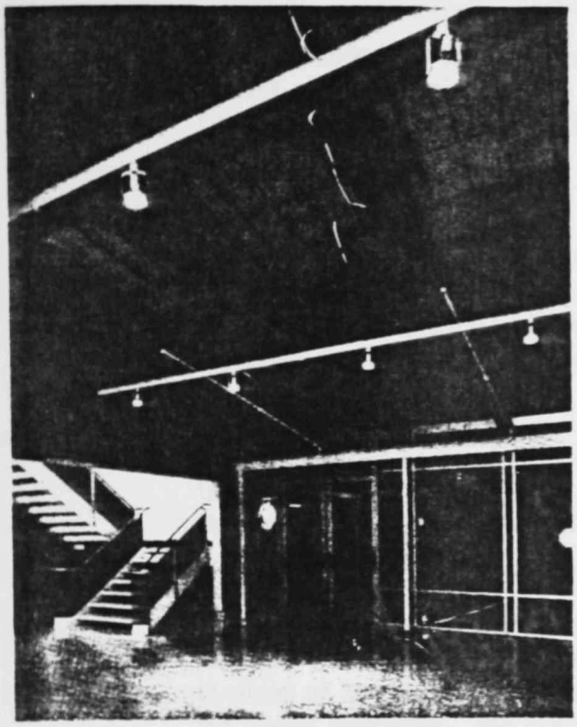
By Susan Williamson

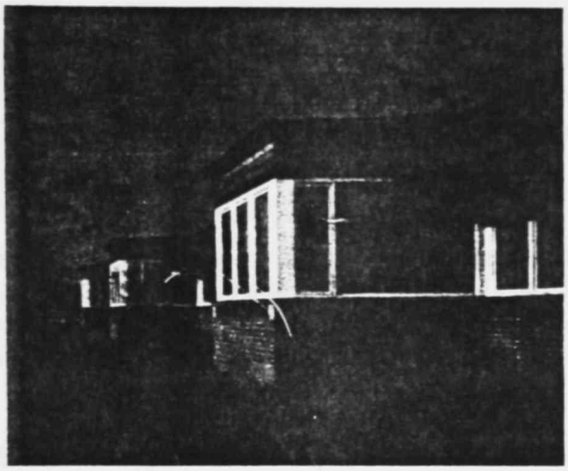
TAPLEY/LUNOW ARCHITECTS of Houston developed a master plan for a Dallas private school that utilizes landscaped courtyards to bring order to a campus previously characterized by distinguished buildings (including the 1961 science and mathematics quadrangle, by O'Neil Ford, S.B. Zisman, and Duane Landry) set in relatively amorphous spaces. The new buildings, along with a new entrance designed by Tapley/Lunow, reinstates Davis Hall, the original school building, as focus of the campus.

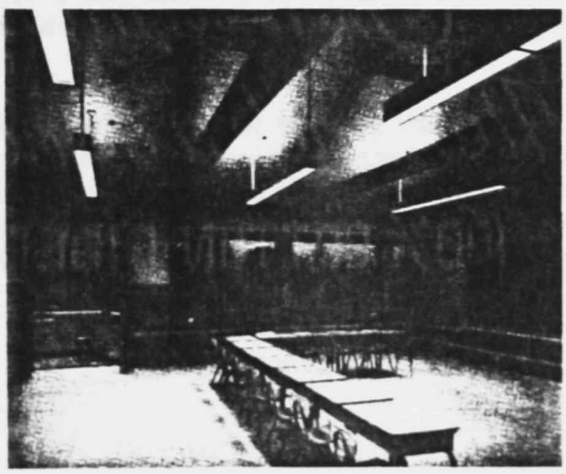
The portions of the plan designed by Tapley/Lunow Architects and completed to date include a new chapel and campanile, a new lower school facility, a new physical science building, an addition to the fine arts building, a remodeled math building, and a remodeled library. Future construction will include a dining hall and an administration building. The new projects serve both to connect previously separate parts of the campus by means of a system of covered walkways and to organize the campus around a series of informal courtyards.

The 24,000-square-foot lower school facility includes 10 classrooms for first through fifth grades, eight of which are paired rooms that share restrooms, teacher's









Top: Additions include, from left, the lower school and the new science building (existing planetarium at right).

Facing page middle left and right: new science building elevations

Far left: Science-building connector

Left and lower left: lower school elevation and classroom interior

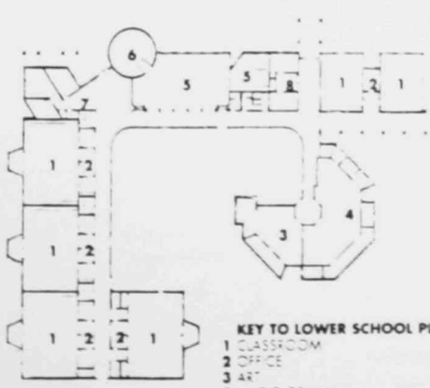
PROJECT *St. Mark's School of Texas*
CLIENT *St. Mark's School of Texas*
ARCHITECT *Tapley/Lunow Architects, Houston (Charles Tapley, FAIA, principal-in-charge; Carl Brunsting, Mark Hoistad, project architects; Leisie Elkins, Dan Evans, Susan Faust, Lenja Gould, George Hallowell, Robert Hubbard, Masa Ninomiya, Tom Polette, project team; Dean Johns, construction administration; Charles Tapley, Guy Hagstette, Lenja Gould, master planning)*
CONTRACTOR *Clark-Morris, Inc., Dallas*
PHOTOGRAPHER *Blackmon/Winters/Kuhne*

offices, and science-project bays, which project from the facade of the building. Art, music, and drama rooms are housed in an octagonal "silo" that extends from the north wing (earlier additions used barn-like forms). The lower school, forming an incomplete U-shape, curves through the site, embracing its own courtyard; a covered, colonnaded walk extends along the interior length of the building.

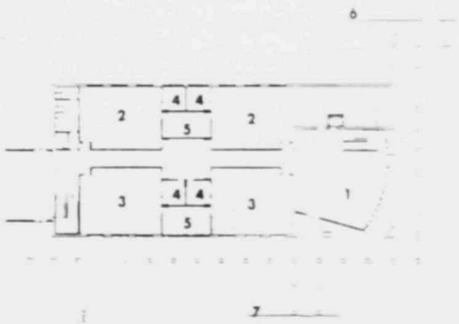
The physical science center, a two story, 26,000-square-foot structure, forms the northern edge of another courtyard, the focus of the three-building math-science complex. Like the lower school, the science center features a covered walk on its courtyard side.

The chapel serves as the boundary between two additional courtyards, an informal court to the west and the formal commencement court to the east. The campanile punctuates both the turn of the commencement court and the axis from the headmaster's residence through the library and Davis Hall.

Standing seam metal roofs, tan and brown brick work in varying patterns, and broad, sheltering eaves throughout establish visual continuity among new structures and existing adjacent buildings. **TA**



KEY TO LOWER SCHOOL PLAN
1 CLASSROOM
2 OFFICE
3 ART
4 MUSIC DRAMA
5 LIBRARY
6 STORYTELLING
7 ADMINISTRATION
8 NURSE



KEY TO PHYSICAL SCIENCE CENTER PLAN
1 DISPLAY LOBBY
2 EARTH SCIENCE
3 MIDDLE SCHOOL SCIENCE
4 OFFICE
5 PREP
6 LIBRARY
7 MATH BUILDING

Case Study 4

Project Name: Fannin Elementary

Location: Bryan TX

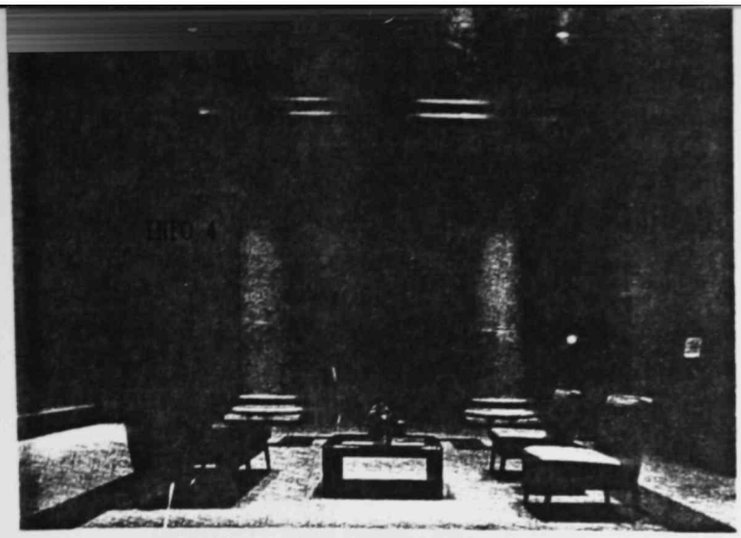
Architect: Burris Patterson Architects, Bryan

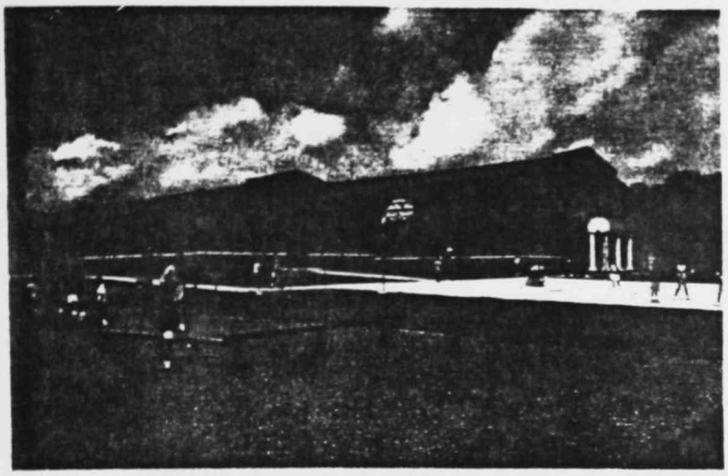
Describe Project in Terms Of Program: This is a rebuilding/replacement of the original school built in 1918. As the original school building had become structurally unsound. The new school had a very limited site, only 4.2 acres. The site is also in a historic district and has many historic oak trees.

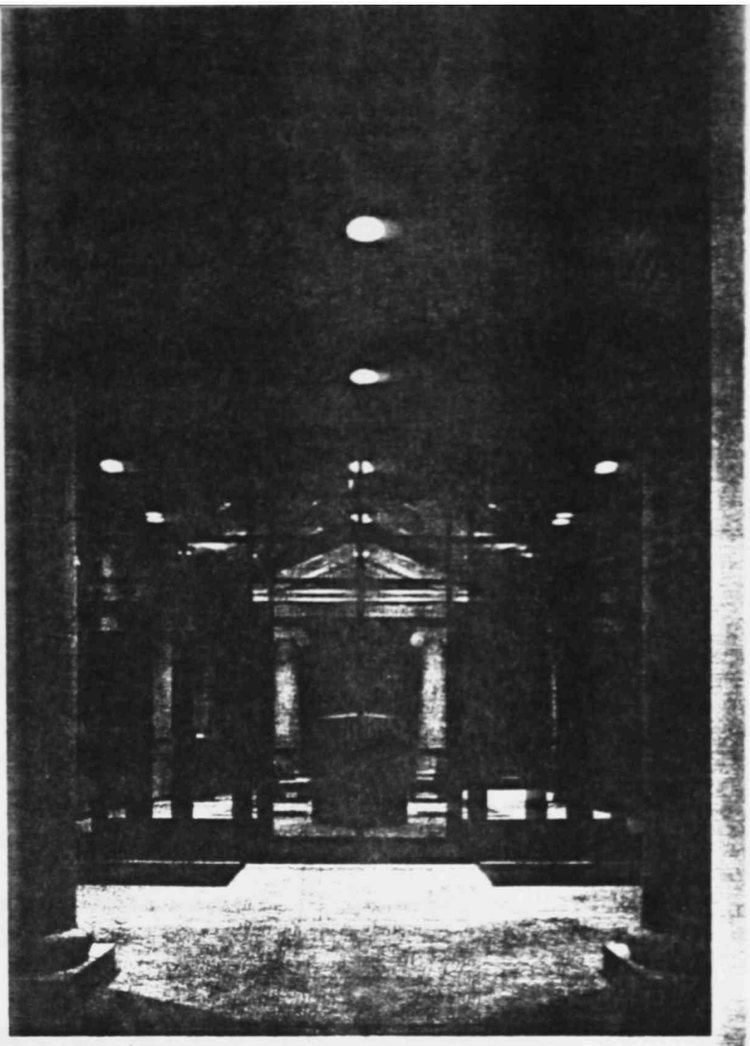
Describe Project in Terms Of Design: The solution was to use an much of the salvaged parts or elements of the original building as possible. this required using the original columns and pediments of the original classical design, in the two story lobby. The heaviness of the pediment is offset by floating it on a brick wall and setting the columns on thin plinths

Describe Project in Terms Of Construction Methods, Materials, And Technologies: The new building is two stories tall and uses gable roofs to help link it onto its historic district. The lobby Windows at night allow passersby to see the historic pediment and columns in their full glory.

Personal Comments, Critiques, or Observations. The lobby is easily the most vivid image of this project. The treatment of the original pediment and columns in the lobby are very effective. The floating of the pediment on a brick wall with an exposed ridge beam is very effective in reducing the visual heaviness. The placement of the columns on pliths further reinforces the floating effect. This, although in direst contrast to the classical imagery, really focuses on the history of the school.







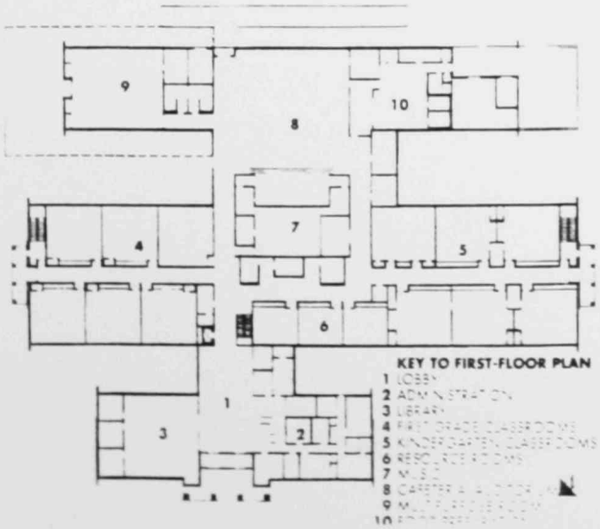
Top left: lobby, with view of the columns and pediment from the 1918 schoolhouse

Top right: the "living museum" at night

Above: Two colors of brick and metal roofs fit with the neighborhood.

Right and plan: Despite the tight site, a winged arrangement saved trees and enhanced multi-grade activities.

PROJECT *Fannin Elementary, Bryan*
CLIENT *Bryan Independent School District*
ARCHITECT *Burris*Patterson Architects, Bryan (Charlie Burris, Fred Patterson)*
CONSULTANTS *Day Brown Rice (mechanical, electrical, and plumbing); MLC Associates (structural); McClure Engineering (civil); Mark E. Ferguson (landscape); Frank Clements Associates (food service)*
CONTRACTOR *Sentry Construction Company, Bryan*
PHOTOGRAPHER *Charles D. Smith*



A LIVING MUSEUM

By Sharon Woodworth

THE OLD BUILDING of Fannin Elementary in Bryan, dating from 1918, had become structurally unsound. Burris*Patterson Architects designed a 60,000-square-foot replacement, despite a site of only 4.2 acres (similar schools require 15 acres) that incorporated the few salvageable elements from the earlier school in deference to its surroundings in a historic district, at the same time accommodating parking and playgrounds while saving historic oak trees. The firm's solution, in a gable-roofed vocabulary of brick and cast stone, is the only two-story elementary in the district. The school's height allowed creation of a tall lobby, where the architects incorporated the salvaged columns and pediment.

The columns, originally five segments high, were rebuilt with only three segments, changing their proportions and relation to the pediment. Burris*Patterson offset the resulting heaviness by floating the pediment on the brick wall and setting the columns on thin plinths visually free of the floor. Exposing the ridge beam helped further lighten the effect.

At night the lobby becomes a kind of historical shop window for passersby, as the glazed entry allows fully lit views of relics that can be seen but not touched. TA

Case Study 5

Project Name: Mount Plesant Elementary School

Location: Nashua, New Hampshire

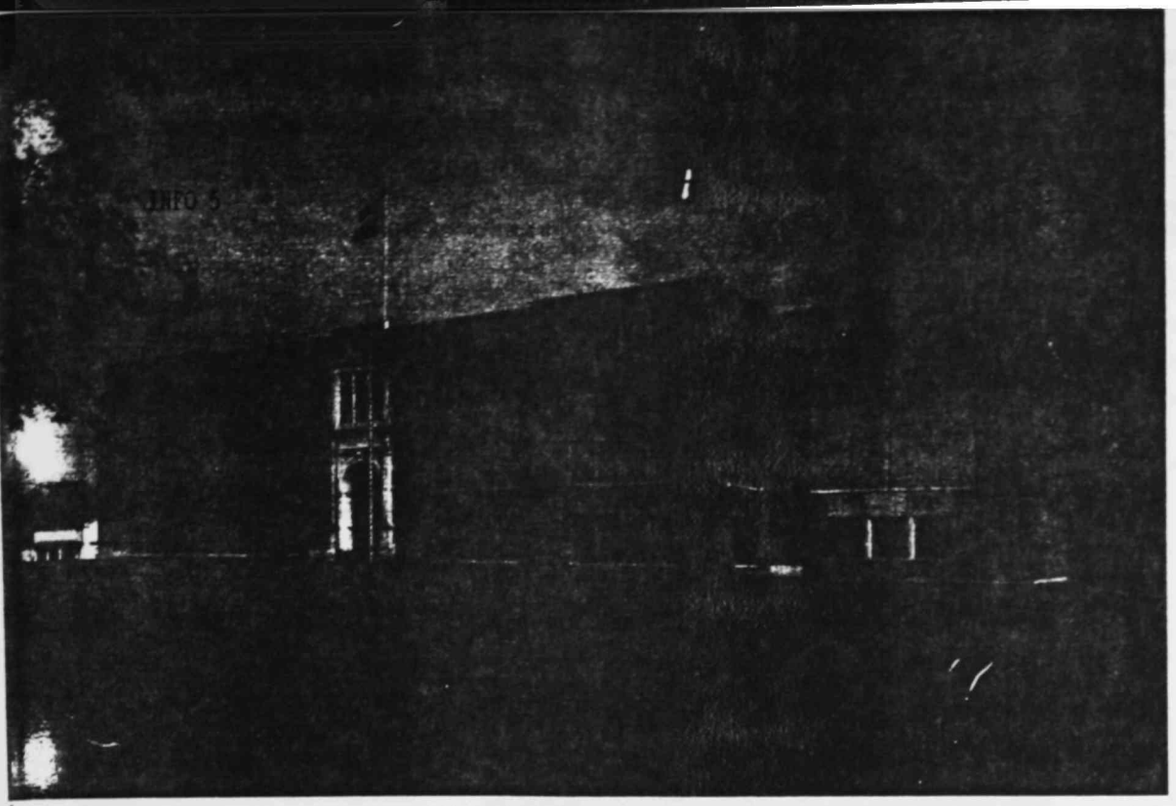
Architect: TAMS Consultants, Boston

Describe Project in Terms Of Program: The program was to renovate the existing 36,000-sq-ft building, and to add an additional 17,000 sq-ft. The addition is to include a gymnasium with a stage, an art ans music rooms, and six classrooms.

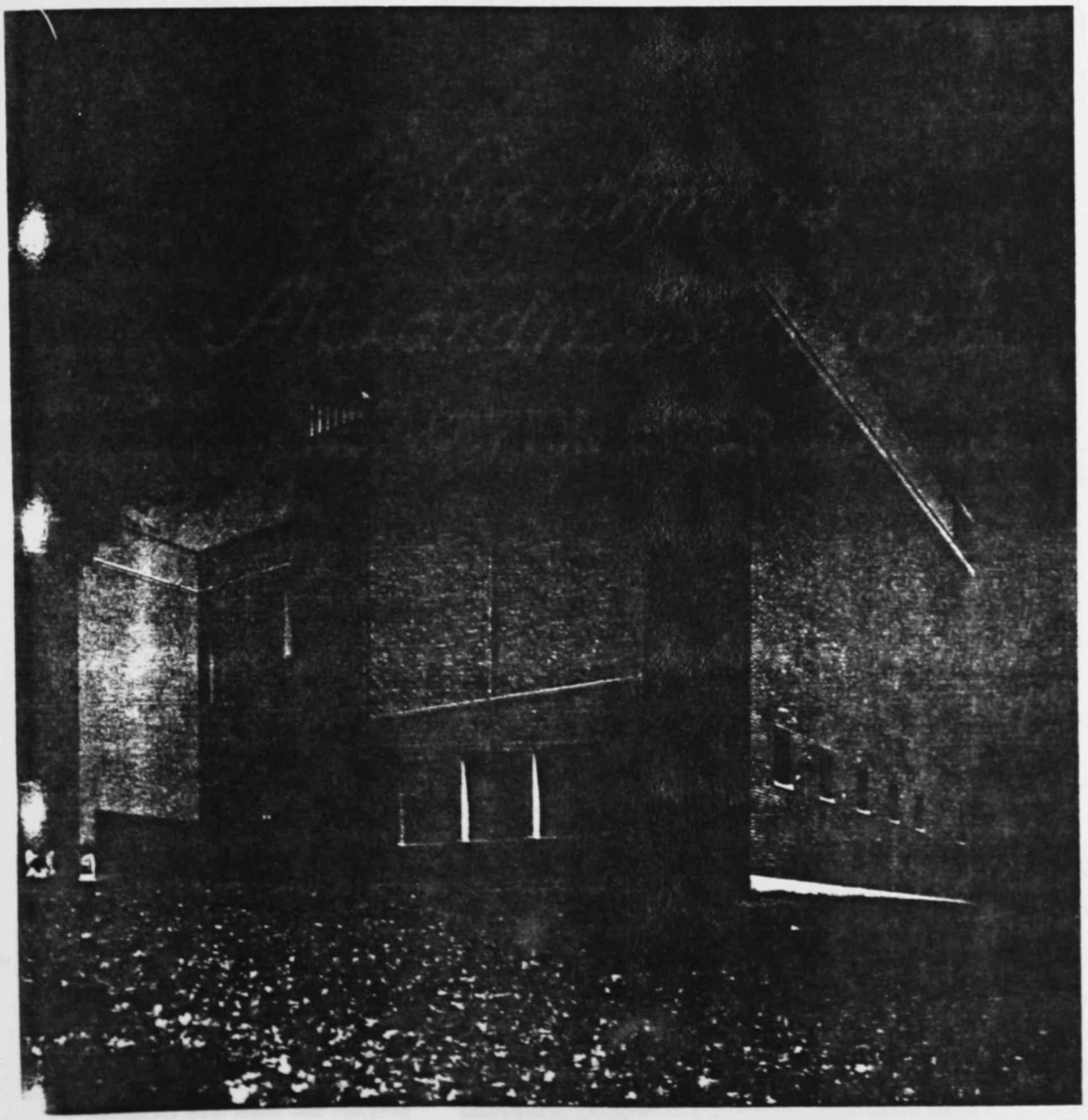
Describe Project in Terms Of Design: The architect added the required additions to this building on the both end of the existing building. The existing building was build in the 1920's, and had strong design elements of that era.
The additions to both wings also borrowed heavily on that design language. The New gymnasium incorporated skylights and a acoustically treated floor to separate it from the music rom below.

Describe Project in Terms Of Construction Methods, Materials, And Technologies: The Most unique construction detail in the gym floor. It is the separation from the two most noisy roms in a school, the music and gym. It is acoustically treated by Separating two conc slabs with 1/2" mineral board and 2" insulation. The gym skylights slope toward the roof and have motorized louvers to allow the gym to be dark for films if needed. The exterior of the additions used similar brick to tie into the existing building. The Details of the additions like string courses also are to match existing design language.

Personal Comments, Critiques, or Observations: The vertical separation and natural lighting innovation of this building are very good.



Classrooms and a gymnasium w added to either side of this 192C school, which was renovated at t same time. The proportions of th older façades were used as a bas for the proportioning of the new wings, and the brick panels of th original building prompted the u of concrete block panels on the l end walls of the additions (1). T gymnasium wing is identifiable edge monitors and high window (2). These additions show what be done with a small budget and lot of attention to detail.



Project: *Mount Pleasant Elementa School, Nashua, New Hampshire.*
Architects: *TAMS Consultants, B (Chris Iwerks, principal in charge project designer; Deborah Allen, p ect architect; Andrew Faunilleroy, thew Donnelly, Margaret Minor, ert Levitt, Regan McClellan, Bets Williams, project team).*
Client: *Nashua School District.*
Site: *small 2.6-acre site in residen area, with lawn in front and pave playground in back.*
Program: *add 17,000 sq ft to incl gymnasium and stage, art and mu rooms, and six classrooms; renova existing 36,000-sq-ft building.*
Structural system: *concrete spread ings, block bearing walls, steel flo framing with steel deck and concr slabs.*
Major materials: *brick, split-faced crete block, aluminum windows, l coated stainless steel monitors (see Building Materials, p. 175).*
Mechanical system: *gas-fired hot w system; ceiling mounted, forced ho system in gym.*
Consultants: *Bay State Design, str tural; AM-Tech Engineers, mech anical.*
General contractor: *John B. Sulliv Corp.*
Costs: *$2,850,000 ($54/sq ft)*
Photos: *William T. Smith*

Selected Detail

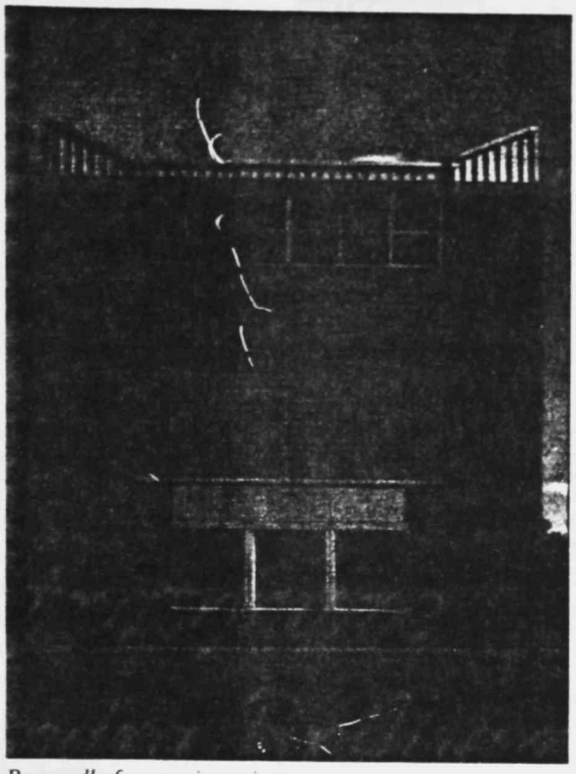
Wall Section
Mount Pleasant Elementary School, Nashua, New Hampshire

Schools contain a variety of often conflicting functions, some of which are quite noisy, such as gymnasiums and music rooms. In suburban schools, the solution to this problem has been to spread the building out, using distance to separate conflicting activities. But in urban schools, on tight sites, other methods must be sought. At the Mount Pleasant Elementary School by TAMS, one of the two new wings contains a gymnasium and auditorium stacked above a music and art room. Acoustical separation among them became a concern.

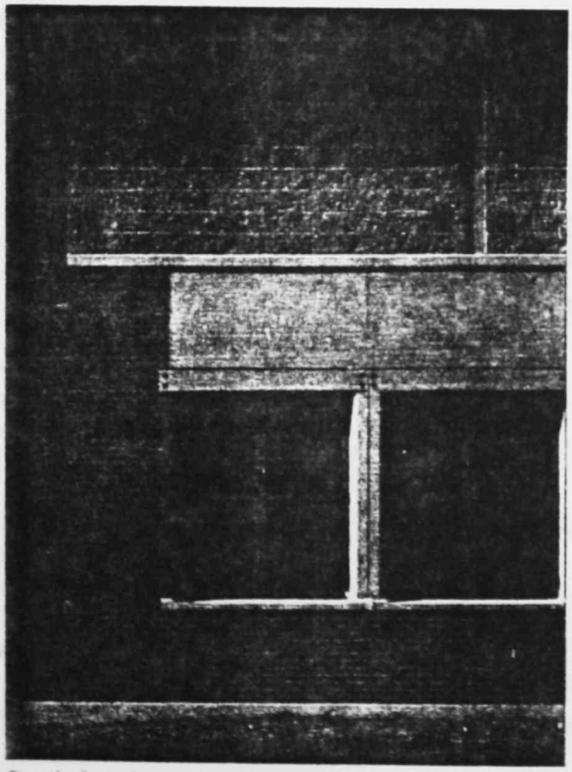
As this wall section shows, a floating slab isolates the gym from the music room below. Consisting of a concrete slab laid on top of half-inch mineral board and two-inch rigid insulation, this floating assembly sits upon a second concrete slab poured over a steel deck. The floating slab also is isolated from the concrete block bearing wall to prevent sound transfer through the structure. The stepped concrete slab in the music room sits on grade.

Another element of note is the perimeter skylight in the gymnasium. Sloped toward the roof, the skylight is tied into the building's parapet and expressed on the exterior by standing seam metal siding. Within the skylight's housing sits a motorized series of louvers that allow the gymnasium to be darkened for movies or performances on the stage. Acoustical panels above the louvers reduce reverberations.

The stacking of functions in older urban schools proved to be less than ideal because of the transfer of sound and impact noise. But such construction methods now make the stacking of activities once again feasible. ■

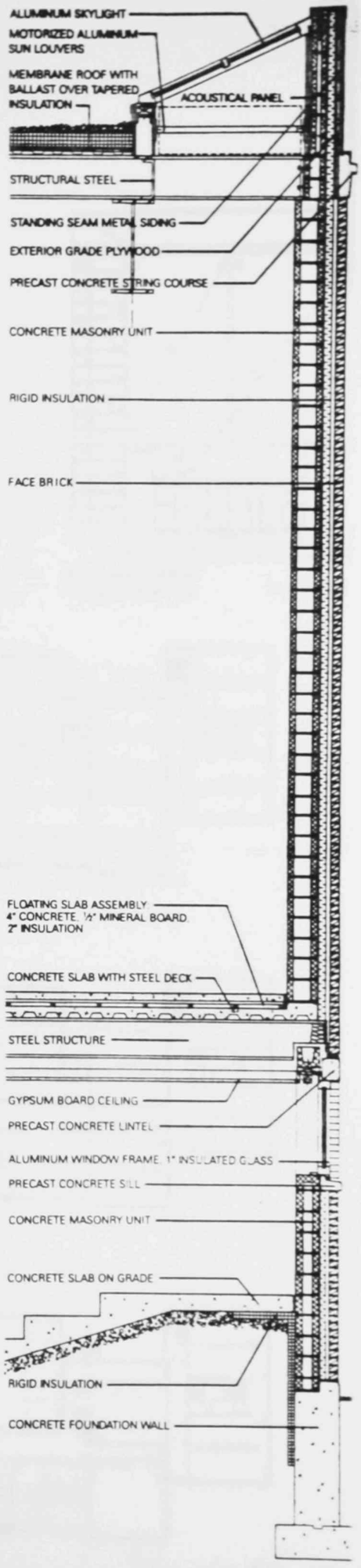


Rear wall of gymnasium wing.



Detail of window and wall.

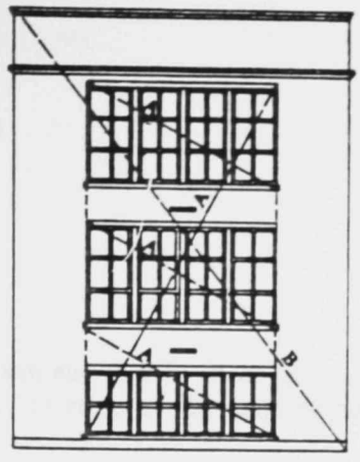
Photos: William T. Smith



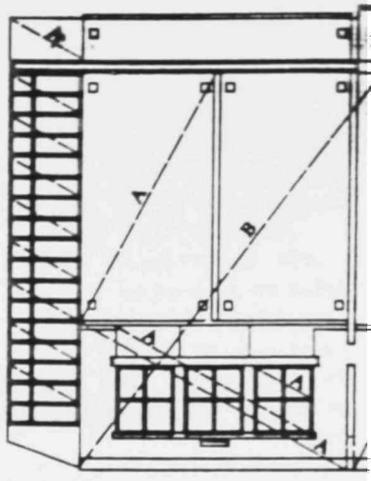
WALL SECTION

A Lesson in Tectonics

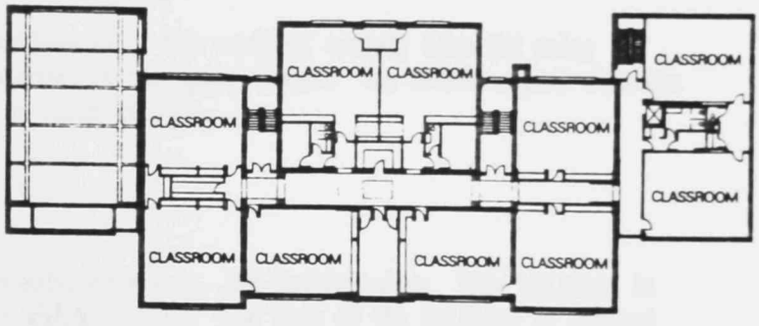
In these additions to an elementary school in Nashua, New Hampshire, Chris Iwerks of TAMS explores various compositional ideas, based upon the logic of plan and structure.



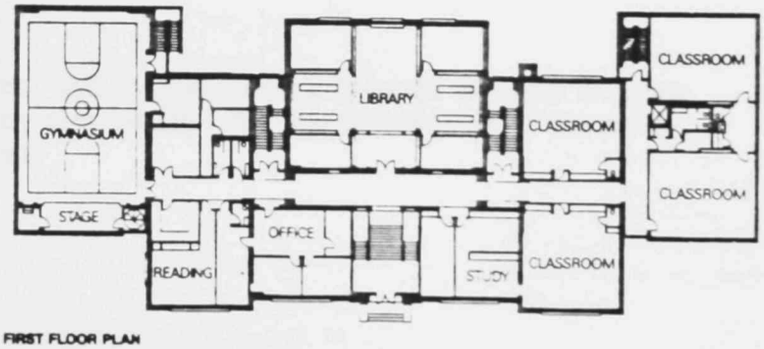
EXISTING BUILDING
TYPICAL CLASSROOM BAY PROPORTIONS



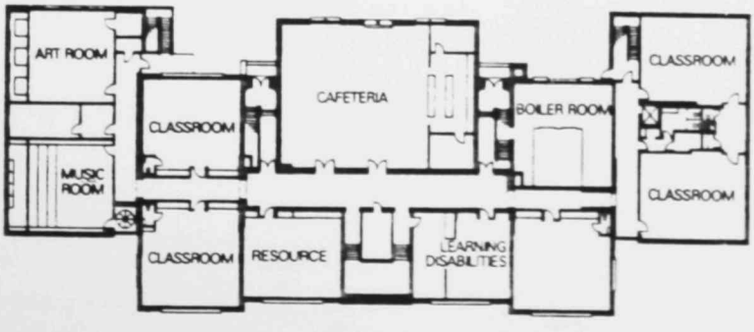
NEW CLASSROOM WING
FACADE PROPORTIONS



SECOND FLOOR PLAN



FIRST FLOOR PLAN



GROUND FLOOR PLAN ■ ADDITIONS

"I am interested in the work of early Modernists such as Behrens and Berlage" says Chris Iwerks. They represent for him a middle ground between those who see architecture as primarily an exercise in composition and those who see it as primarily determined by technology or function. "They were among the last Modernists who argued that composition must dominate, but still be informed by the tectonics of building," says Iwerks. "They never separated architecture and construction."

Their influence is evident in these two small additions to an elementary school, for which Iwerks served as the project designer and principal in charge. The compositional idea of the classroom and gymnasium additions is simple. The brick side walls of the existing school appear to have been pulled away from the building and two concrete block masses inserted into the void. A glazed "zipper" separates the new from the old.

The façades of the two additions have been carefully proportioned, although their composition is not merely an exercise in graphic design. The three-part division of each façade has a functional logic, expressing the plan's division into support areas, teaching spaces, and a circulation zone. The façades' treatment also reinforces their structural role. Frequent reveals, for example, accentuate the thickness of the walls, while deep lintels above the lower windows highlight the walls' load-bearing function.

The straightforward expression of plan and structure here is refreshing when all around us are the excesses of Post-Modern architecture that result from a separation of form and function, and of compositional ideas from their basis in construction. What Behrens and Berlage knew we have had to rediscover: Architecture cannot live cut off from its roots in building. **Thomas Fisher** ■

Case Study 6

Project Name: Townsend Harris High School

Location: Queens College Campus Flushing, NY

Architect: HOK Ny, Ny

Describe Project in Terms Of Program: This was one that is in an urban area as this one. The strong points in the program are the library, in terms on the computer technology, and 65 percent to 35 percent circulation.

Describe Project in Terms Of Design: The building is of the vertical variety with the noisy activities on the lower floors, and the classrooms on the upper floors. The architectural elements of the building are derived from the campus on which it sits.

Describe Project in Terms Of Construction Methods, Materials, And Technologies: This building is for the most part a response to the campus on which it sits. The form of the building is derived form the campus mall and clock tower.

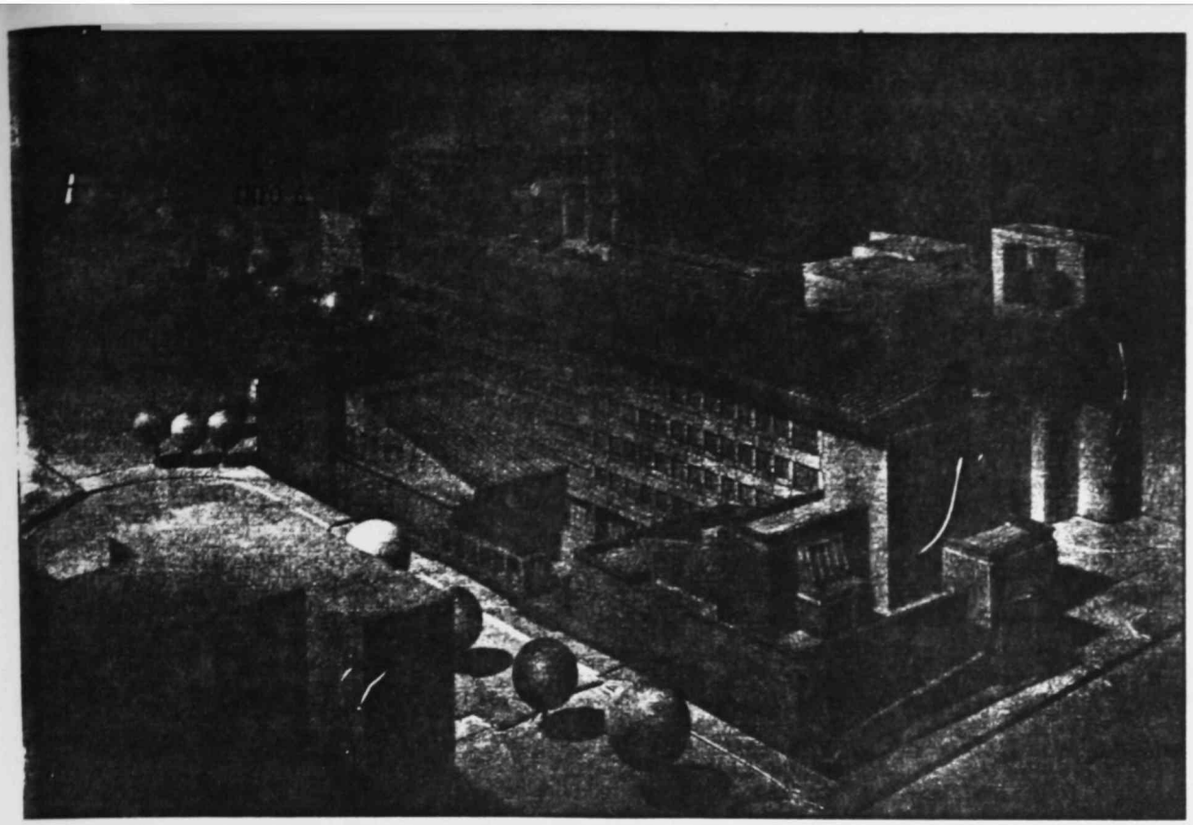
Personal Comments, Critiques, or Observations. This building looks more inward and seems to ignore most of the environment. It is, however, very nice looking. The idea from this one is how not to respond to a single element of the environment.

Project: Townsend Harris High School, Queens College Campus, Flushing, New York
Architects: *HOK/New York*

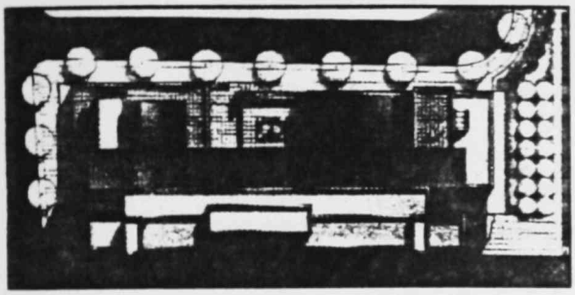
While there are some other schools included here that are in urban settings, none are quite so definitively urban as Queens, New York. So program needs here differ considerably from our other examples. New York City has long had interest in certain specific facilities having a single-focus orientation not unlike the 'magnet' schools popular in the 1960s and 1970s.

The specialty of the 1034-student Townsend Harris facility is the humanities; strong programmatic emphasis was placed on the library in the high school curriculum, with all that implies in terms of computers and making the school responsive to that technology. Also stressed was the desire to achieve a prescribed program to circulation ratio of 65 percent to 35 percent. The school also includes classrooms for language, math, and history; laboratories for sciences, languages, and broadcast media; arts and music; a 500-seat auditorium, a 350-seat gymnasium, and a 350-seat cafeteria.

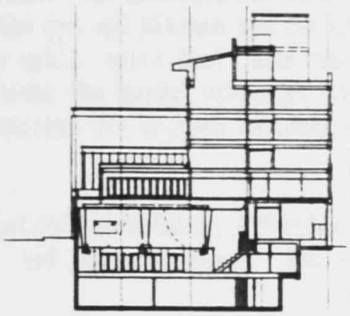
Unlike many of the other examples shown here, this school required no strong expression for expanded community-related functions, but the need was for maintaining "its own domain, ensuring students a harbor for their unique position within the broader environment." To achieve that in part, yet to relate to the campus fabric, forms were chosen that engage in an architectural dialogue with the campus mall and clock tower. The north entry tower, for instance, is seen as a counterpoint to the dominant college clock tower.



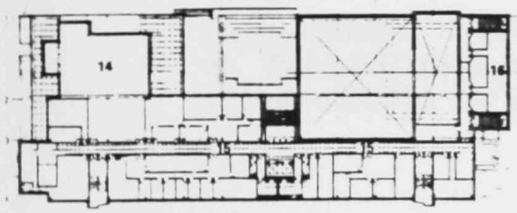
MODEL FROM THE SOUTHWEST



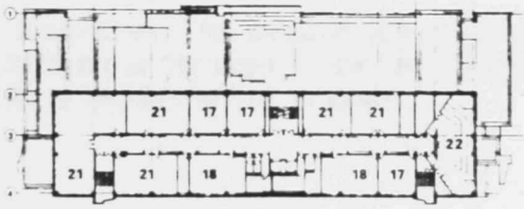
SITE PLAN



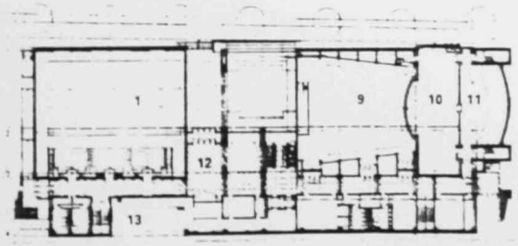
CROSS SECTION



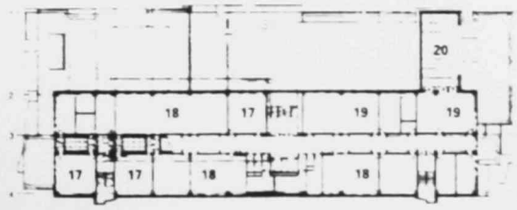
SECOND FLOOR PLAN



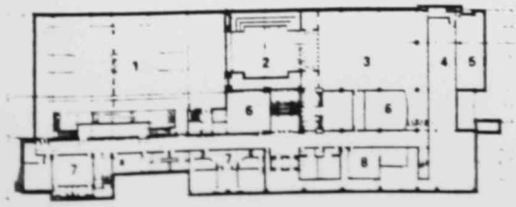
FIFTH FLOOR



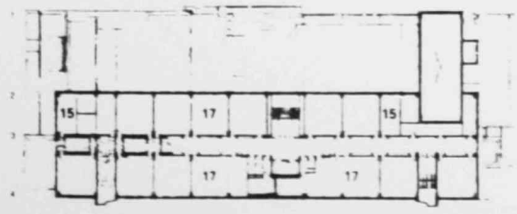
FIRST FLOOR PLAN



FOURTH FLOOR



BASEMENT PLAN



THIRD FLOOR PLAN

1 GYMNASIUM
2 COURT
3 STUDENT DINING
4 KITCHEN
5 MECHANICAL
6 STUDENT ACTIVITIES
7 HEALTH
8 STAFF DINING
9 AUDITORIUM
10 STAGE
11 ORCHESTRA
12 CENTRAL LOBBY
13 SERVICE
14 MEDIA CENTER
15 ADMINISTRATION
16 DRESSING/MAKEUP
17 CLASSROOMS/WORD PROCESSING
18 COMPUTER/COMMUNICATIONS
19 ART
20 TERRACE
21 SCIENCE
22 LECTURE

Case Study 7

Project Name: Lake Oswedge Elementary School

Location:Oswego, Oregon

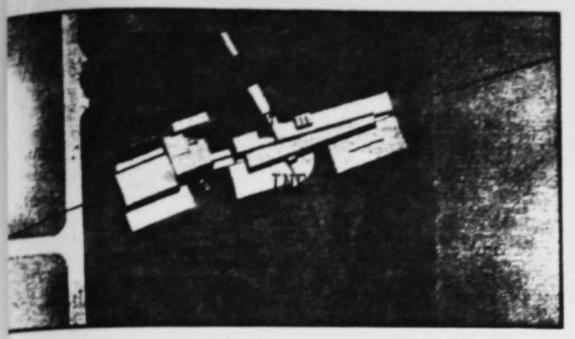
Architect: BOOR/A, Portland, Oregon

Describe Project in Terms Of Program: The building is in a forest and wetlands, on a steep slope, with stream corridors. It is on prime land n a new residential area. It is intended to educate up to 500 students.

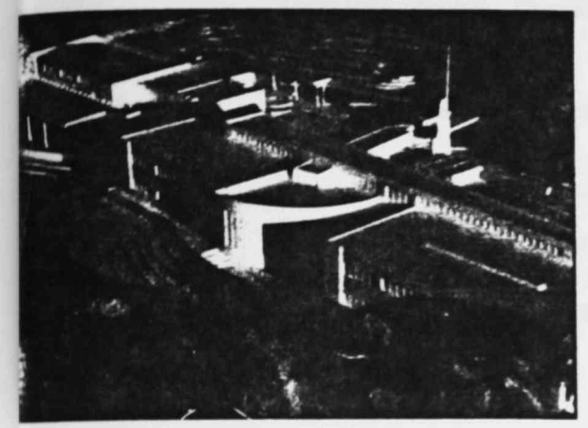
Describe Project in Terms Of Design: the building was built on a slope to allow grade access to both levels of the structure. the gym and kitchen are detached from the rest of the building to allow for greater security. the uphill entry that faces the neighborhood is scaled for the students. And the library overlooks the wooded wetlands. The central corridor is lighted naturally from above by windows. The classrooms are grouped together four around a common area.

Describe Project in Terms Of Construction Methods, Materials, And Technologies: The school is brick and metal panels for durability and low maintenance. The use on lots of windows is both a response to views and lighting.

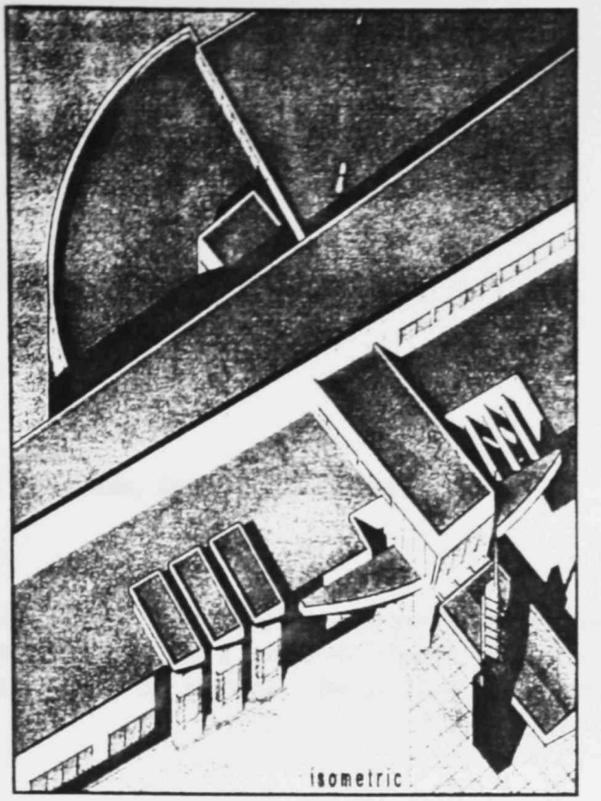
Personal Comments, Critiques, or Observations: The irregular plan form of this building disturbs me. This would seem to lead to confusion as the shapes of the building are not normal. This form, although effective, just looks like an accident waiting to happen.



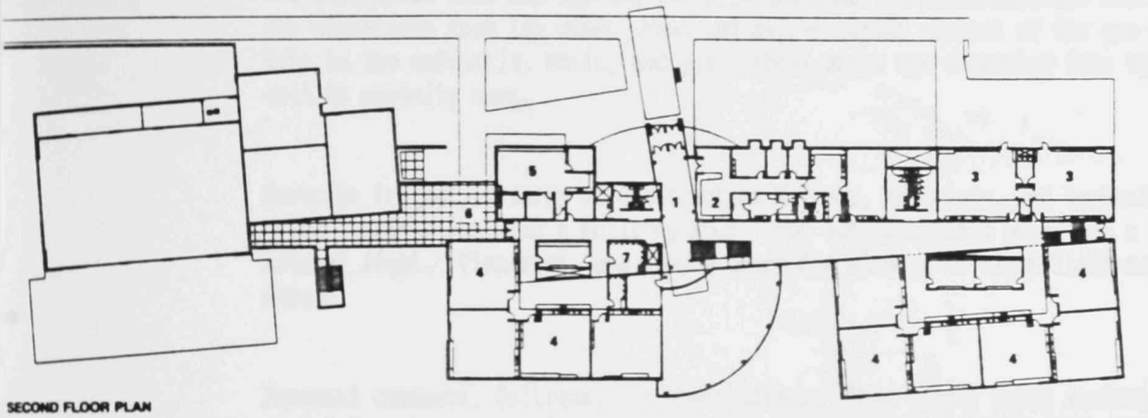
ODEL FROM OVERHEAD



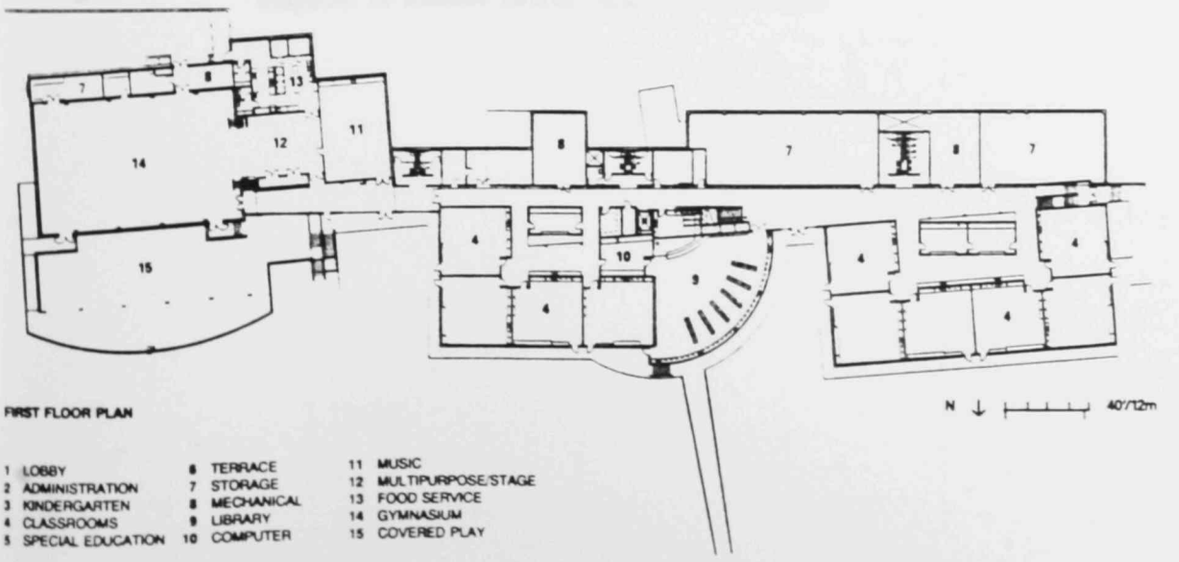
MODEL FROM NORTHWEST



ENTRY



SECOND FLOOR PLAN



FIRST FLOOR PLAN

1 LOBBY
2 ADMINISTRATION
3 KINDERGARTEN
4 CLASSROOMS
5 SPECIAL EDUCATION
6 TERRACE
7 STORAGE
8 MECHANICAL
9 LIBRARY
10 COMPUTER
11 MUSIC
12 MULTIPURPOSE/STAGE
13 FOOD SERVICE
14 GYMNASIUM
15 COVERED PLAY

Project: Lake Oswego Elementary School, Lake Oswego, Oregon
Architects: *BOOR/A, Portland, Oregon*

At 8.5 acres, the site is small for its assigned use for a 500-student school. To complicate matters, there are wetlands, stream corridors, a steep slope, and a forest of large oak and fir trees. The site, treasured and held for over 20 years by the school district, is in a neighborhood of large new residences. The land's natural beauty was a prime concern. As with some of the other examples here, the school was designed for the least interference with the site, both in its plan shape and its two-story configuration. Positioned on the most sloping part of the land, the facility preserves the flatter parts for playing fields and parking. The southeastern part of the land, with its wetlands and trees, is preserved for the school, providing mature landscape, views, solar protection, and a resource for science lessons.

Similar to the example on the facing page, the building is arranged along an indoor street/spine that is clerestoried; and it is widened or narrowed as student traffic demands. Open to the main entrance, the centrally placed library overlooks wooded wetlands. Program elements cluster along the spine to keep the scale of the overall facility in keeping with the neighborhood and the students. Groupings of 4 to 6 classrooms around common areas enhance student/faculty team efforts. Gym/kitchen/community zones are semi-detached to allow maximum control and security and easy after-hours community use. A canopy/tower shelters students and provides an appropriate civic marker. On the uphill side, the one-story elements respect the adjacent neighborhood and provide an intimate, child-scaled entrance. Brick and painted metal panels on the exterior also complement the colors in the residential area, as well as providing durable, low-maintenance surfaces.

Case Study 8

Project Name: Broken Arrow Elementary School

Location: Shawnee, Kansas

Architect: Abend Singelton Associates, Kansas City, Missouri

Describe Project in Terms Of Program: This school is designed with great emphasis on the computer as a teaching tool. The Spaces are to have a graduated integration of computers from one per seven in the beginning to one computer per two students. The building in on a small sharply sloped site with few trees.

Describe Project in Terms Of Design: The architect separated the building into three parts. First the classrooms that are stacked two high and then the administration area. The admin area separates the classrooms from the other areas and allows strict control of the use of these areas. The third area is the cafeteria, music, and gym. these areas are separated from the rest for noise reasons as well as security ones.

Describe Project in Terms Of Construction Methods, Materials, And Technologies: The school uses brick construction with a built-up roof. The administration areas use a high ceiling for generous natural light. Classrooms use french doors and windows to allow light access to all areas of the school.

Personal Comments, Critiques, or Observations: This school makes maximum use of the site by minimizing the amount of corridors in the building. This allows the ratio of 103 square feet per student to be realized. It also helps with the limits of the site. The cluster arrangement of the admin. areas together with the village design motif are nice for that grade level. I also like the computer to student ratios, and interior trees.

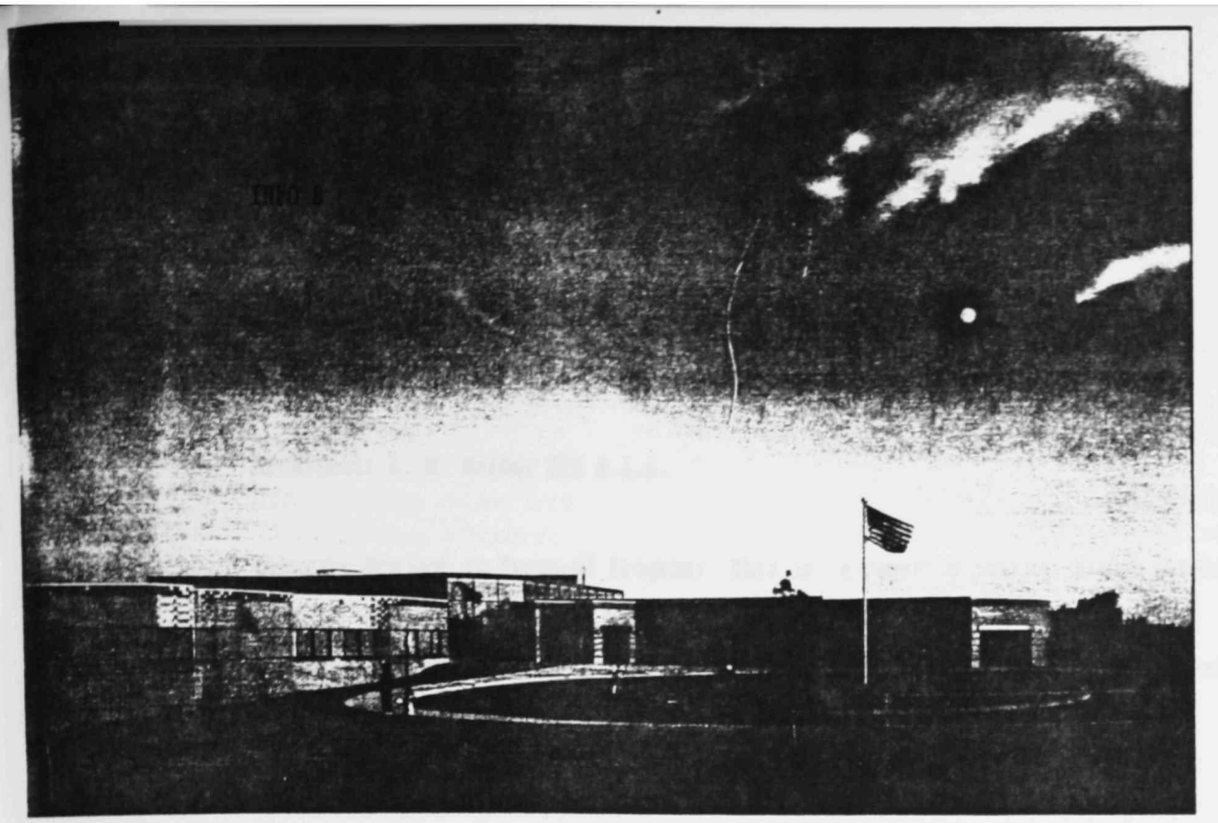
Project: Broken Arrow Elementary School, Shawnee, Kansas
Architects: *Abend Singleton Associates, Kansas City, Missouri*

Named for the Indian symbol of peace and harmony, this 750-student K–6 school, on a sharply sloped 10-acre site (40 percent smaller than recommended), realizes a ratio of 103 square feet per student, 20 percent more efficient than average. The building is located on the more sloped portions of the site, preserving flatter areas for play fields and parking. A treeless hill with a view toward a lake and undeveloped countryside, the land was used effectively, with a two-level structure taking advantage of the terrain.

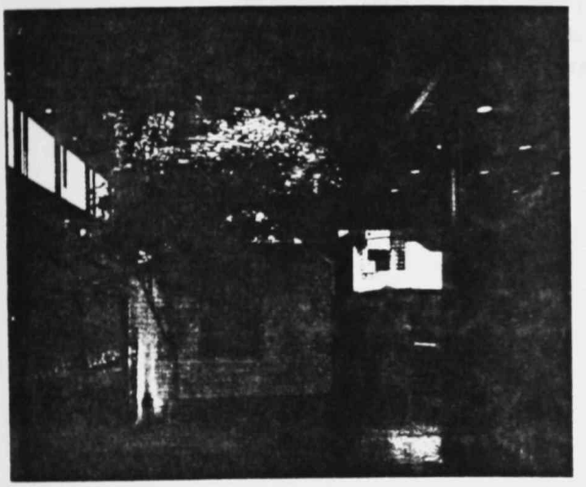
To build class esteem and sense of community, as well as to allow for variations of combined class instruction and/or team teaching, the school is broken down by grade into "minischools." Further distinction is marked by color coding, and by separating play areas for the primary-grade minischools.

Over all, the school is designed to reach maximum use of computer learning technology over time, without the attendant high costs. To reach the programmatic goal of one classroom computer for every two students (initially, one per seven students), classrooms are equipped with computer station outlets, and the shared learning space adjoining each classroom contains a class-size computer instruction lab with 16 rolling computer stations. The stations can thus be used in those areas or in the adjoining classrooms. Further enhancing this "minischool-within-a-school" approach, each classroom has a series of glazed French doors which may be opened to the shared learning spaces.

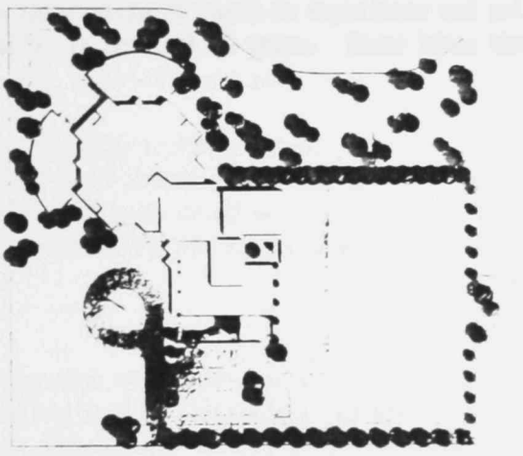
Central to the scheme, both functionally and logistically, the administrative "village" is a colorful series of individual buildings in a high clerestoried space flooded with light. All special function areas are visible from the "village." The activities area is surrounded by a colonnade and, in turn, by special program spaces. The academic wing forms the two-story component.



ENTRANCE FROM THE NORTH

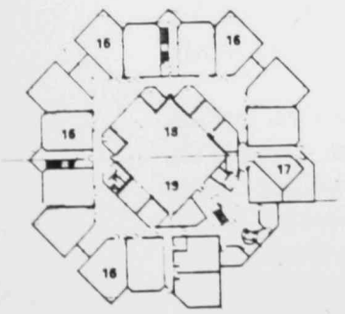


ADMINISTRATION AREA "VILLAGE" ELEMENTS



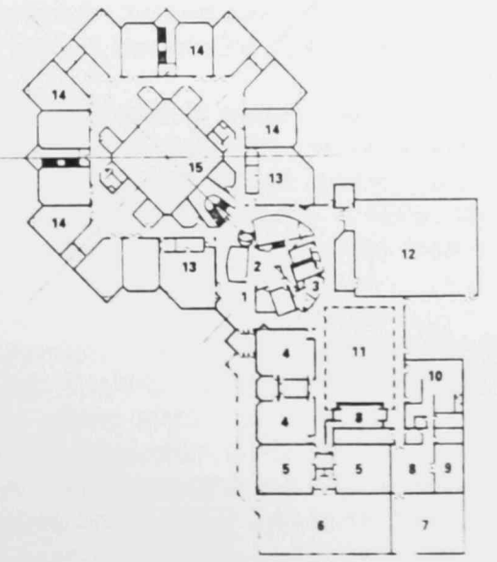
SITE PLAN

N ← 100'/30m



1 LOBBY
2 ADMINISTRATION
3 HEALTH
4 MUSIC
5 PRE-SCHOOL/KINDERGARTEN
6 OUTDOOR PLAY
7 RECEIVING
8 CHAIR STORAGE
9 MECHANICAL
10 KITCHEN
11 CAFETERIA
12 GYMNASIUM
13 ART
14 INTERMEDIATE C R
15 OPEN
16 PRIMARY C R
17 SPECIAL ED RESOURCE
18 MEDIA LIBRARY
19 COMPUTER LAB

FIRST FLOOR PLAN



SECOND FLOOR PLAN

N ← 100'/30m

TWENTY YEARS OF PASSIVE SOLAR IN A HOT HUMID CLIMATE

L. M. Holder III A.I.A.
4202 Spicewood Springs Road #214
Austin, Texas 78759

ABSTRACT

The strategies gained from twenty years of design experience in an hot-humid climate are discussed. The strategies include orientation, solar control, natural ventilation, night flushing, envelope components, active systems, thermal mass, and internal planning.

1. INTRODUCTION

This paper will describe a presentation of selected passive solar residential work spanning twenty years. The projects will be selected from over a hundred built examples of passive solar homes in hot humid climates. The author's work has won awards from the Texas Society of Architects for Energy and Design, the City of Austin for Designing for Area Resource Efficiency, and a Design Award for Affordable Housing. Presentation of the work as a whole has been presented in 14 seminars across the state of Texas in "Solar Realities '79" sponsored by the State of Texas and Texas Solar Energy Society, over 20 seminars throughout the south for the American Institute of Architects "Energy in Architecture" seminars from 1981-1985, and many state and local presentations.

Passive solar architecture has been emerging in the south for many years. The problems of cooling and humidity control in an overheated humid climate are among the most difficult to solve. Buildings within this climate are best built by creating them from the foundation up, rather than taking the existing typical building and adding and subtracting elements until an effective building type is produced.

2. DESIGN STRATEGIES

In this type of climate it is obvious that the first strategy to be dealt with is cooling. The most effective strategy for reducing cooling load is controlling the solar loads. Houses need to be designed so that the maximum solar gain is on a winter morning and the minimum solar gain is on a summer afternoon. They need to be effectively designed so virtually all solar gain in the summer afternoons are indirect loads. Any glazing on the east side should be shaded in the cooling season and open to direct gain in the winter for an early morning heating boost. Any southern glazing, on vertical south facing wall can be unshaded. Any southern glazing on a sloped surface should be shaded caring the cooling season to protect the interior from overheating.

Radiant surface temperatures should be controlled to maximize the effects of other cooling strategies. Control of window radiant surface temperature can be obtained by using thermal break double glazing. The maximum potential of excessive radiant surface temperature is from the ceiling due to excessive radiant transfer through the roof structure. A double ventilated roof system in which outside ambient air is circulated from soffit vents above and below a radiant barrier and out a ridge vent is highly recommended.

Cooling can also be controlled by operation strategies. One of the most effective methods of controlling by operation is using night flushing. During much of the year, the night temperature fall below 70 degrees and effective, natural night flushing can be developed to circulate this air through the house to maintain acceptable temperature levels for the occupants during the next day. It is important to note that once the lower temperature has been reached, it needs to be maintained as low as possible through the afternoon hours. Since the outside air will be above the temperature

Case Study 9

Project Name: TWENTY YEARS OF PASSIVE SOLAR IN A HOT HUMID CLIMATE

Location:Austin, Texas

Architect: L. M. Holder III A.I.A.

Describe Project in Terms Of Program: This is a paper on passive design strategies.

Describe Project in Terms Of Design: The paper presents many ideas on solar design for the reader to consider.

Describe Project in Terms Of Construction Methods,
Materials, And Technologies: There is no construction.

Personal Comments, Critiques, or Observations: The paper is of great use to anyone with the need for this kind of information. The information is based on experience and not of theory, which a lot of the passive ideas that have come up in the last 20 years. Those ideas that did not Perform well are not included.

TWENTY YEARS OF PASSIVE SOLAR IN A HOT HUMID CLIMATE

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of the inside air, only small openings for circulation through the house should be maintained which will allow the exhaust of solar and internal loads but not bringing excessive quantities of outside air through the house. Additional cooling for inhabitants is accomplished through the use of ceiling fans.

A major problem with the hot humid climate, is that for at least two months during the summer, the night temperature seldom dip below seventy degrees. Without a temperatures below seventy degrees, it is difficult to effectively maintain a acceptable morning temperature to make night flushing effective. This is further complicated by the fact that the average temperature during these days is often eighty- five degrees. This is very detrimental to high mass structures that do not have a method of cooling that mass during that two month period as the thermal mass of the structure can reach 85 degrees even without outside influence of solar loads or other internal loads, and those loads can cause that temperature to exceed 85 degrees. The effect on human comfort can be disastrous.

The location of the openings for natural ventilation in the perimeter of the house need to be carefully considered. Inlets on the south side are most effective when located as low as possible in the structure. They should be at least desk height level and preferably just off the floor. The size of these openings is not as important as their location within the rooms. They should be in the corners and, hopefully, on all sides of the rooms. The exhaust location should be as high as possible within the space. Again, their size is not as important as their location and they, too, should be in diverse locations to adequately move the air through the space, naturally, as it rises in the space and exhausts out in the higher levels. Single hung windows on the leeward side will not give adequate air circulation.

Air movement, which is necessary for human comfort at higher ambient temperatures, is provided by ceiling fans. Ceiling fans need to be in all major spaces within the structures and operated when people are present in the room and the temperature exceeds a comfortable level.

The interior of the structure should be designed in the shape of a funnel to allow hot air to naturally rise to a collection point at the highest point in the structure. Heat generators such as kitchens, should be located so that the natural path of the heat, as it passes to the collection point, will not pass any other habitable area. The collection point should have a method of quickly exhausting the air using a hopper or awning window to allow the air to escape into the atmosphere. During heating season, a fan pick-up will re-circulate the hot air from the collection point down to the lower areas in the space. This re-circulated air is used for a source of recovered heat and a method of eliminating stagnation and stratification of air in the space without introducing noticeable air currents in the heated space. This mixed slow moving air allows a decrease in the maintained room temperature and better comfort conditions throughout the house during the winter months.

Other methods of heating include direct gain through windows located throughout the house, but primarily on the east and south sides for minimum adverse effects during the cooling months and sun spaces or indirect gain solar collectors. The temperatures within the rooms can be allowed to rise to any desired temperature during most sunny winter day or be vented into the house to provide the heating for the house for all but the coldest days. A method of connecting these sun spaces to the main house should be provided using glass doors or operable windows. Typically, force ventilation is not required as the operation adjustment of these is on a daily basis and a single daily adjustment will allow them to function quite effectively during the winter months. On cold, cloudy winter days, these spaces are separated from the main house and the temperature is allowed to drop below the comfort level.

The third most effective method used in this climate is daylighting. Daylighting becomes more important because it is a more efficient source of light than artificial light. In effective load

management, all sources of all heat and energy including those of lighting must be reduced. Windows should be high and in diverse locations to give balanced lighting from many different sides. They should be adequate for the lighting levels needed and evenly distributed throughout the spaces.

If passive solar architecture is going to have a significant impact on the build environment, it must be integrated into many building types to satisfy individual tastes of clients. Typically, it is easy to integrate passive solar into regional architecture, but it can also be integrated into all styles if the forms which characterize the style are carefully selected and located. We have striven to integrate passive solar principals into many architectural styles from contemporary to traditional. They have been integrated into and even encouraged in some of the most architecturally controlled neighborhoods in this area. Many of the projects integrate the systems so subtlety that the untrained eye cannot detect the difference, but the performance attests to it's existence. Many other projects derive their form from the passive systems they employ. The program of the individual client determines the form of the project.

Control and operating systems in these houses has been kept to a minimum. Other than ceiling fans and window operation, the systems require a seasonal adjustment or no adjustment at all. Small heat recovery fans on thermostats and solar water heaters are the only elements of the projects which require periodic maintenance.

Orientation for the sun and breezes is a prime consideration. Induction of air flow in most projects is necessary to assure ventilation on sites where there is no breeze. Selective solar control produces 3 to 5 times the solar gain in the winter in the morning as in the summer in the afternoon. In a climate where the average ambient temperature is 85 deg for two months of the year and the low temperature seldom gets below 70 deg for three months of the year, ineffective control of the sun and breezes can be a disaster to a passive solar house. There are many strategies which will demonstrate maximization of the climate compatibility.

Treatment of mass and ventilation systems within the structural envelope of the house will be discussed. Mass is difficult to deal with and if not properly located and isolated can be counter-productive. Not only is ventilation within the house necessary, but also combinations of radiant barriers and ventilation systems within the structure can effectively control surface and air temperature within the habitable space.

3. CONCLUSION

When properly integrated into the building, passive solar systems can create a living environment that enhances the climate throughout the year even in hot humid regions. When the comfort problems are directly addressed with passive solar and not masked with a conventional air conditioner, the differences in indoor and outdoor temperature, humidity, and light are blended to enhance the homeowner's perceived adaptation to the natural climate. This allows the free use of indoor/outdoor spaces most of the year and expands the limits of the useful environment of the home.

Case Study 10

Project Name: Generator Repair Facility

Location: Canyon, Texas.

Architect: L. M. Holder Iv

Describe Project in Terms Of Program: This was a unused portion of the campus that was being used by these people as a shop. The Portion of the building being used by the students was upgraded and improved for their use.

Describe Project in Terms Of Design: This was simply putting the ideas of passive solar design in to effect in an existing building.

Describe Project in Terms Of Construction Methods,
Materials, And Technologies: This involved putting in more insulation in the walls, cutting skylights in the roof, etc.

Personal Comments, Critiques, or Observations: This was a very simple job. The effects of the job are very far reaching. The performancs of this retrofit brought a new building in the campus totally designed for passice solar. This, although it seemen insignificant, really had an impact on the school administration.

Operational Results of a Passive and Active Solar Wind Generator Repair Facility in Canyon, Texas.

This paper will detail operational results of the operation of a passive and active solar building with out conventional mechanical backup systems. Included will be interior temperature charts during various climatic conditions, Summaries of the energy generated by the photovoltaics and the wind generator, and usage patterns in the building. Also included will be comments on the performance of the solar rock bed storage, the solar water tube storage, the direct gain passive solar, the passive cooling , the daylighting, the photovoltaic freestanding lights, the 2 kW grid connected photovoltaic array, The 10 kW wind generator, and efficient use of the excess electric power generated by this facility.

The building has performed near predicted comfort conditions and, this winter, the staff closed a few air leaks which will produce even better conditions. The building has maintained predicted, acceptable conditions with few exceptions since occupancy last spring. The monitoring equipment recently installed has begun producing the data for analysis.

All systems are operating and work well together. The insulated shutters on the east glazing have not been installed but will be one of the next refinements to the systems.

The rock bed got wet during construction and took several weeks to dry out. The actual operation of the rock bed during winter and summer operation will be discussed.

Daylighting has allowed the building to operate without artificial lights.

The building is producing more electricity than it uses, and the excess is being used to recharge the batteries on an electric car. Problems with the rate electricity is charged back to the utility has encouraged the innovative ways to use the excess power. When the 10 kW wind generator is producing electricity and the power requirements of the building use are very low, the 8 kW battery charging requirements of the electric car has been a good match.

We proposed to the State of Texas and DOE to design and construct a building that would use 30% of the energy of a standard building, and we delivered one that is a net energy producer rather than a net energy user. The Canyon building accomplishes this criteria producing human comfort and lighting using the climate, process and equipment loads using renewable energy, and as a bonus, provides transportation with some of the excess energy of the system.

Case Study 11

Project Name: Gem of the Hills Community/Recreational Center

Location: Blanco County, Texas

Architect: L. M. Holder III, AIA

Describe Project in Terms Of Program: This is to provide a community center for the people in the area of Blanco. The building is to be of maximum flexibility and adaptability.

Describe Project in Terms Of Design: This building more than meets the design acquirements.

Describe Project in Terms Of Construction Methods,
Materials, And Technologies: This building makes maximum use of passive design solutions for the building.

Personal Comments, Critiques, or Observations: The remoteness of the site and the passive solar solutions are perfectly matched in this building. The location with its breezes allows for great natural ventilation.

Project Name: Gem of the Hills Community/Recreational Center
Location: Blanco County, Texas
Owner: Gem of the Hills

Proposal Narrative

1. Demonstration Project Description.

The Gem of the Hills Community/Recreational Center is a 5,600 square foot Energy Efficient Demonstration Project which will exemplify the potential use of alternate energy sources available in today's building market. Much of the funding for the project is being provided through citizen donations; and volunteers from Blanco will be actively involved in both the construction and operation of the community center.

Blanco is one of four sites in Texas selected by National Historic Trust in a three year pilot program for their Heritage Tourism Project to increase tourism. The Gem Of The Hills existing outdoor pavilion is the only site that can accommodate 200-250 people in the area at this time. It will bring additional tourist to the area to view the construction and the finished project.

The community center will be located in the LBJ Heartland Region, just north of Blanco, on highway 281 equidistant from both Austin and San Antonio. The facility will be open to all the people during the week and on the weekends. The recreational center will also serve large group and community functions. Easy access from two major metropolitan areas and the flexible operating schedule will allow anyone who is interested in renewable energy applications to visit the building, experience the interior environment, and study the renewable energy applications.

A primary objective of the project is to demonstrate to the public the positive effects of how a structure and its components can work with the environment to simultaneously reduce the energy loads and maximize interior comfort levels for the occupants. Both passive and active strategies will be employed.

The entire community center utilizes passive solar space conditioning. The center is also designed to take advantage of the prevailing southerly breezes during the summer through natural ventilation; and the center will follow the principle of night-flushing any heat from the day to pre cool interior spaces. Windows are also designed to allow natural daylight to illuminate interior spaces.

Active solar systems will be used to reduce the electrical load from utility companies. An active solar water heating system will be utilized to heat water. Photovoltaic Powered Water Pumps will be used to demonstrate advantages of using a grey water system to meet landscaping needs. The project will also demonstrate Off Grid Photovoltaic Signs and Photovoltaic Parking Lot Lights.

Because of the special design features and alternate energy sources which are integrated into the community center, the operation of these systems will vary from the operation of conventional systems used alone. It would be difficult to impossible to instruct all the various users as to the proper operation of the passive and renewable systems; therefore, to insure successful operation, instructions composed of drawings and written instructions behind framed glass attached to the wall will be displayed at the control points for each of the systems in the building. For example, before turning on the air conditioning, passive strategies should be implemented until excessive climate conditions require the use of conventional systems. These instructions will describe in detail the appropriate procedures for alternate energy systems during various outdoor conditions and seasons.

Metered information will be available and reviewed by L. M. Holder for the systems being utilized in this project. Staff at the community center will also be instructed on proper operation of the systems in the center at the beginning of each season for the first two years.

The staff of the center will be available to share information about the renewable energy applications to interested individuals who want to tour the facility. They will also be available to explain some of the important design principles which enable the center to work with the environment. The instructions written by our office and posted on the wall will assist the staff to give accurate information to the visitors.

2. Target Audience

The primary audience will be the residents of Blanco and the surrounding communities. Many of the residents are retired and live on fixed incomes and would like to include passive solar and renewable techniques into their homes. This project allows them to experience first hand the environment created by passive solar and renewable energy strategies. Although this facility is used primarily by retired persons, it is the gathering center for the whole area. It will host senior proms and homecoming functions, a theater group will present plays here, and social and service organizations will hold meetings at the center. Family reunions, art and crafts shows, and church functions are just a few more of the types of the activities which will be held at the community/recreation center. Most of the residents of Blanco county will use this facility.

Photovoltaic systems are particularly useful in remote locations where it is expensive to run utility lines for water pumps, lights etc.. It is our goal to increase the interest and to demonstrate the applicability of these types of systems to the rural residents who are currently living the Hill Country Region.

The project location provides easy access to anyone interested in passive solar design and renewable energy technology/applications from either the Greater Austin Metropolitan Area or the San Antonio Metropolitan Area. With a traveling time of just under one hour from either of the metropolitan areas, it is the intent that this project will reach all interested people from these areas.

At present, nearly two million visitors travel annually through the region visiting the recreational facilities of this area. Many of these travelers are searching for attractions along the way. The community/recreational center will advertise with a Photovoltaic Sign and offer tours to visitors who wish to stop by. There will be a banner across the main highway in downtown Blanco to advertise the tours and the hours. It is our aim to share this information and increase energy awareness with the visitors passing through this area. In addition, L.C.R.A. will include this project in the L.C.R.A. Education Programs Tour Book which is given to all school districts in the 44 county L.C.R.A. area.

3. Energy and Cost Impact

Because of the long hours of usage, 12 hours a day, 7 days a week, a well used community center has higher energy usage than other buildings with less hours of operation. Therefore, when energy consumption is reduced in the community center, it has more impact on the utility grid. It is estimated from computer simulations included in the appendix that the Community Center will operate on approximately 40% of the annual energy costs that a community center would normally incur. The actual calculation would indicate that a standard building type with the intense use of a well utilized community center would use almost 200,000 BTU/s.f./year source energy or about $635.00/month utility cost. With the same intense use and the addition of the active and passive solar design as well as natural ventilation, daylighting, and other strategies employed on this building, we estimate a savings of $4,568.00/year or about $380.00/month. This translates to a usage of under 30,000 BTU/s.f./year source energy or 23,515 BTU/s.f./year site energy. In the five years it will save over $22,500.00. We also reduced the peak load by over 50%.

The passive solar applications of this project represent a 9.4% increase in construction cost. The active solar applications of this project represent a 7% increase in construction cost. An additional 7% increase is due to design fees and special cost associated with metering and showing the facility. The systems will be evident and clearly explained. The transfer to new construction can easily reduce consumption by 20-50% in residential and commercial projects in the area. Most people will pay 10-20% extra for their permanent homes if they can save 20-50% of the energy now and in the future.

This project will demonstrate the technology and be an operating example. We have found that one in ten persons who attend seminars or tours will try to use the technology demonstrated. If 60 people tour the facility, each month, six of them will use the technology and save 20-50% of the energy for their home of office. This translates to 120 houses or offices in five years. The peak load of those houses is 5 kw/house or 600 kw of peak load will be displaced. This translates to a power generator twice the size of the Decker or 3M solar plants. It would cost $600,000.00 to build 600 kw of coal power, $216,000.00 to build 600 kw of gas turbine peaking power, or the most likely new plant, $315,000.00 to build 600 KW of a combined cycle plant. Clearly this demonstration project is the best investment for the L.C.R.A., and the citizens of Blanco.

4. Project Evaluation.

The performance of this project will be evaluated both quantatively and qualitatively. The quantitative analysis will be accomplished using metering and recording devices. The qualitative analysis will be evaluated using analysis of building usage, building comfort, and system acceptance.

All major loads of the community center will be metered separately. This will include lights, air conditioning, heating, water heating, and other loads.

Sensors will be installed to record indoor and outdoor temperature, humidity, and equipment operation. This information will give us building performance during various climatic conditions. It will also give us conditions that exist when conventional systems are used.

Careful records will be kept to record maintenance of the conventional systems as well as the renewable energy systems. These records will be used to calculate maintenance required per KWH used or saved.

Qualitative evaluation requires time to develop. This involves providing instructions and training to improve the utilization and understanding of the systems in the community center and thereby provide the comfortable, pleasant environment that can be created by the systems employed. The written instructions attached to the wall as discussed in the project description will help maximize performance.

To insure that the building is being operated at optimum performance, L. M. Holder III will make eight visits to the project during the first two years of occupancy - one during each season. Each visit will include a debriefing for the season before, in which questions will be answered and any instructions modified as necessary. This will help to fine tune the running of building systems to climatic conditions of this region. The instructions will also serve to educate building occupants to more efficiently operate the systems of their own houses and commercial buildings.

5. Technical Feasibility and Practicality.

In central Texas, passive solar is cost effective and has demonstrated numerous applications compatible with standard construction techniques. Construction elements necessary for passive solar techniques are incorporated into most buildings, but are not installed or utilized correctly to yield an energy reduction. Below is a discussion of some basic passive solar techniques to be included:

Passive cooling is provided by a combination of strategies. First is careful orientation and shading of glass to minimize solar gains during the cooling season. The second is natural ventilation, an effective tool for comfort in central Texas during most of the spring and fall months. Careful design should be utilized to minimize solar loads and properly locate the inlet and outlet for natural ventilation. Flow rates must be carefully maintained to exhaust internal and solar loads while maintaining, as long as possible, the cooler temperature achieved by night flushing. This process is accomplished using low inlets and high outlets for the natural ventilation with relatively small free area. A computer simulation will help determine the optimum size of the flow rates and the size of the openings for the natural ventilation. This system is also used for night flushing. The passive solar project is ventilated throughout the night to reduce the mass temperature. When occupancy occurs, flow rates are adjusted throughout the day to maintain comfortable temperatures for extended periods. The ceiling fans provide effective cooling at times when the passive solar project is being used in a cooling mode.

The walls of this passive solar project will be insulated with standard batt insulation. A layer of 1/2" rigid board insulation will be added just behind the sheetrock on both the walls and ceiling. The rigid insulation in combination with the roof and wall construction effectively isolates the gyp board from outside temperatures. The gyp board tracks interior temperatures and of the structure becomes part of the mass of the space, and continues to absorb radiant heat even in the summer. Winter comfort is increased by wrapping the structure with an infiltration barrier "Tyvek" and using polycell in all cracks.

The roof will be a composite structure composed of an exterior reflective layer provided by a metal roof. There will be a ventilation layer immediately below the metal roof which takes in air through continuous soffit vents and passes it under the roof. Then it exits through the continuous ridge vent at the ridge of the roof. Below this ventilated air space will be a radiant barrier which has a ventilated air space below it. This space will take ambient temperature air from the soffit and transfers it below the radiant barrier and exhausts it also at the ridge vent. The actual temperature of the lower layer of air will be very near outside ambient temperature. This system not only reduces the radiant gain from the sun using radiant barrier but effectively reduces the attic temperature from 140 to 160 degrees, the standard attic temperature, down to 90 to 110 degrees, which is the recorded afternoon summer temperature of the air film on top of the insulation in similar installations. The thermal integrity of the roof will be further enhanced by standard batt insulation.

One of the most effective types of collectors in the central Texas climate is a sun space. The south facing glass of the sun space should be oriented to receive the sun's rays during the heating season and minimize the loads during the cooling season. The glass used for the sun space is carefully oriented clear glass. Storage of some of the heat from the sun is provided by a tile floor, which is mid-tone gray or brown. This color range reflects much of the heat into the air, but absorbs enough heat to keep the tile warm until 9-10 p.m. This room is typically separated from the main part of the passive solar project by operable doors. Circulation is primarily natural i.e. the doors are opened to use the heat of the collector and closed to increase temperatures in the collector. In this project, fans will be installed to assist this operation, especially during unoccupied periods. On cloudy winter days, when the collector temperature is not increased by the

sun, it is important to use low 'E' glass to minimize losses and maintain the collector as a habitable space.

The high volume meeting room is designed to be comfortable for large and small groups in the cooling mode. When the sun is warming the building during the winter, comfort can be easily maintained. However, with few occupants on cold, cloudy winter days, radiant heat must be introduced into the space. This heat will be provided by a high efficiency fireplace.

Daylighting is provided for the project with windows strategically placed. Also, careful selection of the window glass coatings and selection of interior color and surface is needed. The design of the structure will provide effective and comfortable levels of illumination in all parts of the building without artificial illumination on sunny days and minimal dependence on artificial illumination on cloudy days. Daylight controls turn off excess fixtures when daylight is available.

An active solar water heater with a heat exchanger and an anti-freeze loop will be provided. It will include a 120 gallon tank with 36 square feet of collector area with photovoltaic power operating the pumps.

The expected life of the passive solar systems on the project is anticipated to be the life of the building. Most of the active solar would have an anticipated life of 15 to 30 years before major components might have to be replaced. However, we can safely say most systems with proper supervision and maintenance will remain operational for the life of the project.

Systems selected for use in this demonstration project have proved to be reliable on a long term basis, since most have solid state electronics and few, if any, moving parts. Maintenance on these systems should not exceed maintenance on comparable conventional systems.

6. Project Team.
Lower Colorado River Authority
Gem of the Hills
L. M. HOLDER III, AIA
LARCE McELROY HOLDER III - PRESIDENT

Architect: Registered in the states of Texas, New Mexico and New York; Certified by the National Council of Architectural Registration Boards

EDUCATIONAL BACKGROUND: Bachelor of Architecture, University of Texas at Austin, 1968

PROFESSIONAL EXPERIENCE: L. M. HOLDER III, AIA; Austin,Texas; Owner; 1976 - Present; Commercial Architecture, Residential Architecture, Land Planning, Energy Consulting--over 100 built examples of residential and commercial passive and hybrid solar buildings.
Jessen Associates; Austin, Texas; Project Architect 1973 - 1976; Commercial Architecture, Institutional Architecture, Industrial Development Planning.
Thomas Leach and Associates; Austin, Texas; Associate Architect; 1968 - 1973; Commercial Architecture, Residential Architecture.
Danze and Davis Architect; Austin, Texas; Draftsperson; 1967 - 1968; Residential Architecture, Commercial Architecture.
Texas Parks and Wildlife; Austin, Texas; Park and Park Facility Designer; 1965 - 1967

MEMBERSHIP: American Institute of Architects; Texas Society of; Architects, Austin Chapter; Past Board Member: Texas Solar Energy Society; Past Chairman: City of Austin Council Appointed Energy Conservation Commission; Past Chairman: City of Austin Committee to Develop Solar Ordinances; Member: Advisory Committee for Model Energy Conservation Codes for the State of Texas; Member: Texas Energy Conservation Plan, Citizen Advisory Committee; Member: Energy Development Fund Advisory Committee, Energy Conservation Task Force; Past Chairman: Renewable Energy Subcommittee of the Travis County Extension Energy Committee; Member: Central Texas Energy Association; Member: City of Austin Task Force for Development of Energy Codes Commercial Code Subcommittee; Past Board Member: Texas Renewable Energy Industries Association; Member: Technical Evaluation Committee for Research to support a Residential Energy Conservation Standard. Sp53 TEC for ASHRAE and Dept. of Energy; Member: Austin Plan-Energy Committee; Director: American Federal Savings Bank

RESEARCH INTERESTS: Passive Energy Systems; Climatological Adaptations of Building Design; Solar Energy; Insulation and Ventilation Systems; Computer Simulation Models

LECTURES ON ENERGY: ENERGY CODES: Building Code Official Conference. Environmental Protection Agency. Dallas, 1976.; ENERGY CODES: Energy Seminar. University of Houston, Houston, 1977.; ENERGY CODES: Architects and Engineers Conference. Dallas, 1977.; ARCHITECTURAL ADAPTATION OF SOLAR AND PASSIVE ENERGY SYSTEMS. Energy Conservation and Solar Seminar. University of Texas. Austin, 1977, 1978, 1980; ENERGY CODES AND PASSIVE ENERGY SYSTEMS. Professional Development Program. Texas Society of Architects, Houston Chapter. Houston., 1977.; PASSIVE ENERGY SYSTEMS. Texas Society of Architects Convention. El Paso, 1977.; ARCHITECTURAL ADAPTATIONS OF SOLAR AND PASSIVE ENERGY SYSTEMS. Texas Society of Architects, Austin Chapter, University of Texas. Austin, 1978.; ARCHITECTURAL ADAPTATIONS OF SOLAR AND PASSIVE ENERGY SYSTEMS. Rice University of Guest Lecturer. Rice University School of Architecture. Houston, 1979, 1981.; PASSIVE ENERGY SYSTEMS. Texas Solar Realities 1979. Sponsored by the Texas Energy and Natural Resources Commission. (TENRAC). 14 Lectures throughout the state of Texas, including Austin, Houston, Dallas, Lubbock, El Paso, Corpus Christi, Brownsville, and San Antonio.; CASE STUDY. PASSIVE SOLAR OFFICE BUILDINGS. Texas Solar Realities 1979 Statewide Conference.; PASSIVE ENERGY SYSTEMS. Wichita Falls, 1979.; ARCHITECTURAL ADAPTATIONS OF SOLAR AND PASSIVE ENERGY SYSTEMS. Texas A. & M. University, 1980.; ARCHITECTURAL ADAPTATIONS OF SOLAR AND PASSIVE ENERGY SYSTEMS. Louisiana Society of Architects Convention, 1981.; ARCHITECTURAL

ADAPTATIONS OF SOLAR AND PASSIVE ENERGY SYSTEMS. Austin Homes Show. Austin, 1981, 1982, 1984, 1985, 1986.; ENERGY EFFICIENT INCOME PROPERTY. Texas Solar Realities 1981 Statewide Conference.; ENERGY IN ARCHITECTURE. Instructor for series of workshops sponsored by the American Institute of Architects. Phoenix, Denver, Knoxville, Atlanta, Tampa, Dallas; (2) Los Angeles, Newport Beach, Orange County; (3) Sacramento, Cheyenne, San Diego, Tallahassee. 1981-1985.; PASSIVE SOLAR OFFICE BUILDINGS. Department of Energy Seminar for Designing and Managing Energy Conscious Commercial Buildings -- An Intensive Workshop. Denver, 1982.; "MICROCOMPUTER BASED ENERGY ANALYSIS." American Institute of Architects.; Participated in program development, wrote one of the four computer programs used in the seminar; also instructor at Washington, D.C., Richland, San Diego, Dallas, Sacramento,1984-1985.; "DESIGN TOOLS FOR EVALUATING ALTERNATIVE STRATEGIES IMPACT ON HUMAN COMFORT." Conference on Energy Efficiency in Hot Humid Climates. Bryan, Texas 1985.; "ENERGY EFFICIENCY AND TEAMWORK." Seminars for architects, engineers and building owners. Sponsored by State of Texas; 1983-1984.; "ENERGY ANALYSIS USING MICROCOMPUTERS." American Institute of Architects National Convention, San Antonio, Texas 1986.; "GETTING TO 1:1 WITH MICRO BASED CAD/D" and "FILE MANAGEMENT FOR MICRO CAD/D" American Institute of Architects National Convention, San Antonio, Texas 1986; ADVISORY TASK FORCE for integrating computers into the curriculum for the College of Architecture and Environmental Design, Texas A & M University, 1986; Texas Association of School Business Officials Conference "Energy Efficient Renovations and Additions" Galveston 1988; TWO PASSIVE HOMES IN HOT-HUMID CLIMATES American Solar Energy Society, Inc.; 12th Annual Passive Solar Conference, Portland Oregon, 1987.; WORKSHOPS AND PRESENTATIONS at SOLAR 90.;

PUBLICATIONS: SOLAR REALITIES '79 - Passive Solar Workbook Sponsored by : State of Texas Governor's Office of Energy Resources and the Texas Solar Energy Society. ; Responsibility: Passive workbook coordinator and commercial consultant. Author of section on Design Principles.; TEXAS ARCHITECT, MARCH/APRIL 1980 - "Energy In Architecture"; Article featured personal interview and Spicewood Office Building.; AUSTIN, JUNE 1981 - "Solar Living"; Article featured residential and commercial projects of our firm.; TEXAS REALTOR, OCTOBER 1981 - "At Home With the Sun - Passive Solar Design"; Article featured residential and commercial passive solar designs of our firm.; AUSTIN HOMES & GARDENS, OCTOBER 1983 - "In Harmony With Nature; Article featured personal residence of L. M. Holder III.; ENERGY EFFICIENCY AND TEAMWORK - Design of Commercial Buildings (A seminar workbook) Sponsored by Energy Efficiency Division of the Public Utility Commission - State of Texas.; Developed by: L. M. Holder III and Michael N. Hart, 1984.; "Design Tools for Evaluating Alternative Strategies Impact on Human Comfort" 1985 Building Symposium on Improving Building Energy Efficiency in Hot and Humid Climates, with Michael N. Hart. April 1985; "GUIDELINES FOR ENERGY CONSCIOUS SCHOOL DESIGN IN TEXAS" Provided for the Energy Resource Center for Texas Schools to encourage the design of energy efficient schools in the state of Texas, 1986; TWO PASSIVE HOMES IN HOT-HUMID CLIMATES American Solar Energy Society, Inc.; 12th Annual Passive Solar Conference, Portland Oregon, 1987.;

AWARDS: VARCO PRUDEN BUILDINGS named Anderson Exchange Shopping Center to its 1986 Hall of Fame for Excellence in Design and Construction. TEXAS SOCIETY OF ARCHITECTS ENERGY AWARDS 1986. Winner of Merit Award for passive solar custom residence for M/M C.J. Burleson of Kerrville, Texas. This award emphasized design excellence and energy efficiency. TEXAS SOCIETY OF ARCHITECTS ENERGY AWARDS. Winner of Merit Award for passive solar custom homes residence for Jim and Wanda Holmes of Austin, Texas. This award emphasized design excellence and energy efficiency. AFFORDABLE HOUSING COMPETITION WINNER 1986. City of Austin Housing and Community Services Department. First place design winner for the construction of six prototype residences. The intention of this competition was to produce low cost, energy efficient housing. DESIGNING FOR AREA RESOURCE EFFICIENCY (DARE) 1986. Competition Winner City of Austin Resource Management Department. This competition emphasized innovative solutions to water, soil, and energy conservation. CITY OF AUSTIN APPRECIATION 1982 for 'Outstanding Achievement in Conservation and Efficient Use of Energy' thereby significantly improving the overall energy conservation program of the city. AUSTIN PARADE OF HOME 1981-'BEST OF SHOW' Awarded for excellence in design, decoration, city planning, and energy

efficiency. ARMCO DESIGN AWARD 1979 for Spicewood Office Building. Awarded for design excellence in a commercial building.

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EXPERIENCE: 10/83 - present PROGRAM MANAGER, ALTERNATE ENERGY City of Austin Electric Utility, 721 Barton Springs Road (78704)
Manager of the Alternative Energy Generation section of the Electric Utility. Responsible for developing and implementing programs related to alternative generation including photovoltaics, solar thermal, fuel cells, small cogeneration, thermal storage, and wind for the Utility. Out section conducts feasibility research regarding alternative generating options for the utility- e.g., evaluates capital costs, operating costs, energy production, operating experiences at other utilities, etc. After completing the initial research, we run computer models to quantify the value of building a plant in Austin. If an option appears feasible, we implemented a program to conduct further research or, install an operating plant in Austin. Following is a list of projects and programs I am responsible for: PV300- Project manager for the installation of 300 kw photovoltaic plant. Developed designs and specifications, and supervised the utility design and construction team during installation; PVRES- Installation of two, 1 kw residential photovoltaic systems. Units have been installed and are now in the test phase. WIND STATION- Installation of a wind monitoring station to evaluate the potential for wind generation in Austin. Interim report has been published. SOLAR THERMAL SYSTEMS- Designed and installed four solar thermal systems for City-owned buildings. RESEARCH- Fuel cell power plants, compressed air energy storage, small cogeneration plants and developed interconnection guidelines for small power producers. PHOTOVOLTAIC PROJECT/3M- Project manager for the installation of a 300 kw photovoltaic concentrator project jointly owned by the 3M Company and the City of Austin. Plant will be completed in early 1989.??
EDUCATION: M.S., Engineering Science, In Applied Solar Energy, Trinity University, San Antonio, Texas. Thesis Topic: "Application of Indirect Evaporative Cooling in Commercial Buildings", 8/83. B.S., Civil Engineering, in Environmental Engineering, Tufts University, Medford, Massachusetts, May 1977.
PUBLICATIONS: "Control of Integrated Mechanical Dehumidification and Passive Cooling Systems to Produce Energy Comfort", Proceedings, 1982 AS/ISES Annual Meeting, Houston June 1-5 (E.S. Doderer and D. Marcus); "Austin- PV Helps Meet Demands". PV International, Aug. 1985.; "Centralized Photovoltaics for Austin, Texas Elect. Utility" Proceedings, 1986 ASES Conference, Boulder CO., June 11-14.; "Construction Experience With a 300 Kilowatt PV Plant in Austin, Texas" Proceedings, 1987 ASES Conference, Portland, July 12-14.; "The Future of PV Power Plants: Conventional of Alternative" PV International, May 1987.
OTHER:
Registered Professional Engineer, State of Texas.
Delegate to China for "People to People Exchange Program" on Renewable Energy. Three week tour of Peoples Republic of China-May, 1986.

Jerry Fleming P.E.

PERSONAL: Born-April 10, 1949, married.
EDUCATION: Bachelor of Science in General Engineering, 1971, Oklahoma State University
EXPERIENCE: May 1982 to present, Jerry Fleming P.E. Consulting Engineers, President.; April 1979 to May 1982, Texas Parks and Wildlife Department, Austin, Texas, Engineer III.; April 1977 to April 1979, George Maxwell Engineers, Austin, Texas, Mechanical Design Engineer.; December 1976 to March

1977, Hughes, Gano & Associates, Inc., Austin, Texas, Design Engineer.;July 1974 to October 1975, Engineering Inc. of Austin, Austin, Texas, Design Engineer.; June 1973 to July 1974, Bovay Engineering, Inc., Austin, Texas, Junior Engineer.; Has worked with L.M. Holder III, AIA on several projects including design of Active Solar Heating and DHW system on Spicewood Office Park.; Other projects include: **Projects for the City of Austin, Projects for State of Texas, Schools, Church Facilities, Financial Institutions, Medical Buildings, Office Buildings, Restaurants, Retail/Wholesale Stores, Strip Shopping Centers, Solar Systems, Military Projects, Renovation of Existing Buildings, Monitoring, Evaluation, Promotion, Assistance by the Lower Colorado River Authority and the Pedernales Electric Co-Op.
**List of projects available upon request

7. Scope of Work and Schedule.

Schedule:

1. L.M. Holder III, AIA will work with John Hoffner and Jerry Fleming to design a passive solar recreation center owned by the Gem of the Hills. John Hoffner will design the Photovoltaic Systems. Jerry Fleming will design the electrical and mechanical systems for the building and for the passive solar systems. L.M. Holder III, AIA will design the recreation center along with the passive solar and daylighting portion of the project, perform computer simulation and integrate all systems into the project. The project will be bid and while under construction the appropriate professional will inspect the installation of all systems.

2. L.M. Holder III, AIA, Gem Of The Hills Board of Directors, and L.C.R.A. staff will identify target audience and the L.C.R.A. staff will contact those persons to inform them of the project.

3. L.M. Holder III, AIA will photograph the installation of the renewable system during routine inspections of the construction. He will also photograph the completed project.

4. The L.C.R.A. will monitor the project for two years. L.M. Holder III will evaluate the data quarterly and make recommendations for operation modification when appropriate.

5. L.M. Holder III will prepare at least 2 articles for publication. One will be for the National Passive Solar Conference and the other will be directed toward the utility industry.

6. L.M. Holder III will assist the EMC in the preparation of a technology transfer sheet describing the project.

7. Gem Of The Hills and L.M. Holder III will coordinate and arrange 6 tours of the facility. The first will be at the dedication ceremony. In addition, we will conduct 3 lectures for local citizens interested in the project. The tours and lectures will be coordinated to coincide with the 8 quarterly site visits.

8. L.C.R.A. will provide assistance for individuals interested in the implementing the technology demonstrated in the Gem Of The Hills. L.M. Holder III, AIA will provide assistance for those wanting more detailed plans and specifications.

9. Gem Of The Hills will coordinate with L.C.R.A. to file quarterly performance and visitor reports to the EMC. L.M. Holder III, AIA will review those reports prior to their submittal.

10. L.M. Holder III, AIA will prepare a final report summarizing the installed project cost, owner savings, operational procedures, and the effectiveness of the systems. It will include recommendations for the most cost effective measures to be employed in this region of the State and what other areas each system would be appropriate for.

8. Budgets.

For Building simulation:

Time for LMH @ $75.00/hr.			
6 hrs. x $75.00			$ 450.00
Time for Staff @ $40.00/hr.			
40hrs. x $40.00			1600.00
	Total		$2050.00

For Photovoltaic Consultant:

Time for John Huffner @ $50.00/hr.			
5hrs. x $50.00			$ 250.00

Tours:

Time for LMH for 6 tours			
6 x 2 hrs.ea. x $75.00/hr.			$ 900.00
Time for staff of Gem Of The Hills 8 tours/mo.			
8 x 1 hrs.ea. x $10.00 x 24 mo.		1920.00	
	Total		$ 2820.00

Lectures/Seminars:(3-2 hrs. in length)

3 x 2 hrs. x $75.00/hr.		$ 450.00	

Signs Describing Building System Operation:

Time for LMH			
4 Hrs. x $75.00/hr.			$ 300.00
Time for Staff			
24 hrs. x $40.00/hr.		960.00	
	Total	$1260.00	

8 Site Visits for Staff Training
and System Operation Revision:

LMH-8 visits @ 3 hrs. @			
8 x 3hrs. x $75.00/hr.		$1800.00	

Final Report:

Time for LMH @ $75.00/hr.			
8 hrs. x $75.00		600.00	
Time for Staff @ $40.00/hr.			
20hrs. x $40.00		800.00	
	Total		$1400.00

Case Study 12

Project Name: Bowie Jr. High

Location: Austin Texas

Architect: L. M. Holder III A.I.A.
Thomas R. Glass P.E.
Mike Hart P.E.
Glenn Crow Ph.D.

Describe Project in Terms Of Program: This is a Jr High School Designed to be energy efficient from the beginning. The people listed above were brought in during the design stage to provide consulting on the energy efficiency of the building.

Describe Project in Terms Of Design: The school is for up to 600 students of the Hr High level. The school was designed with the classrooms separate from the rest of the school spaces. The Physical Plant is the smallest in the Austin area.

Describe Project in Terms Of Construction Methods'

Materials, And Technologies: The school is mostly of brick construction and a standing metal seam roof. The windows have a special light shelf that allows the classrooms to me naturally lighted during 95% of the year.

Personal Comments, Critiques, or Observations: The separation of the classrooms from the rest of the spaces does not seem to work to me. The main mall is of all concrete. This is very uncomfortable during all but a few days a school year.

Goals, Strategies, and Results for a Passive Solar, Daylit, Naturally Ventilated High School in a Hot Humid Climate

L. M. Holder III A.I.A.
Thomas R. Glass P.E.
Mike Hart P.E.
Glenn Crow Ph.D.
Judith Carroll

This paper describes the passive design strategies, goals, and actual results of the energy efficient Bowie High School completed in August 1988 in Austin, Texas. The 455,500 sf school for grades 9-12 is one of the largest passive solar, daylit, and naturally ventilated building complexes built in a hot humid climate in the last thirty years. Calculation and modeling procedures will be presented along with Operating schedules, set points, control strategies, actual temperature, footcandle levels, and other pertinent data. In addition to designing the project, the architects and energy consultants have been retained to optimize the operation of the systems and controls. We are working with set points, metering, and operating procedures to maximize their impact on human comfort and minimize operating cost. The systems have proved to operate very close to the design calculation and with this additional input, we will be able to further improve the operation. We will be available to discuss these procedures if this paper is selected for presentation.

Of the 410,200 sf of enclosed space, 25% is daylit, with passive solar heating and natural ventilation and no mechanical system. 24% is daylit with passive solar heating and cooling and mechanical backup. 41% is heated and cooled with economizer cycles. Much of this area is daylit and many of the areas have economizer which are forced air systems separate from the mechanical equipment. 2.5% of the space is heated and fan ventilated and less than 7.5% of the space is conventionally heated and cooled.

The daylighting systems were computer modeled and some areas scale model tested to minimize cost and maximize effectiveness. The scale model testing was used to maximize performance of geometry and eliminate building details which were not cost effective i.e. curved ceiling and north light shelf. It also permitted the designers to visualize the effectiveness and appearance of the daylighting elements. The completed building has performed very closely to the predicted results. Design considerations included orientation, placement of glass, light shelves, and shading devices, glare control, and control of artificial lighting.

The natural ventilation is available to over half the school. It was designed by computer modeling and consultant experience. The mall and circulation areas are in natural mode at all times. There are operable windows on the north, east, and west while much of the south face is open to the prevailing breeze and passive solar gain. These areas have already been tested in the summer mode and there was no perceived discomfort even on the hottest days. In the cooler months, the malls are warmed from waste heat vented from the classrooms and solar gain from the large south facing clerestories.

The classrooms were designed to allow both natural ventilation and automated night flushing. Inlet and outlet sizes were optimized by computer simulation. The chilled water is cut off when the campus automation system determines the climate is within the potential of natural ventilation mode and the classrooms enter the natural ventilation mode. Temperature is controlled by opening windows in the classrooms.

The night flushing mode is controlled by the campus automation system and all heating and cooling is disabled. The intent is to use cooler nighttime temperatures to reduce the classroom temperatures as near 65 degree as possible. If the classroom reaches 65 degree the vents close. During the heating season optimized start heating will bring the air temperature to 72 degree as the classroom

is occupied. Cooler surface temperatures provide a heat sink for the occupied classroom during the day.

The gymnasia cooling is provided by a thermostatically controlled fan assisted, four stage ventilation system at times when that cooling is available. The heating and cooling system is disabled during this operation. Industrial ceiling fans further extend the time when this mode can be used.

Much of the rest of the building systems employ an economizer system which is computer operated based on the enthalpy of the outside air.

The 750 ton peak cooling load is satisfied by two 215 ton chillers and a 280,000 gal chilled water storage tank. Gas fired boilers and variable speed pumps are combined with the 16 EER cooling system.

The ongoing data collection and analysis will continue to provide additional information for presentation. The data will be collected under an agreement with the Energy Efficiency Division of the Governor's Office whereby the State of Texas provides funds for study of energy conservation possibilities during the design of the facility and documentation of the performance during the operation of the facility.

Goals, Strategies, and Results for a Passive Solar, Daylit, Naturally Ventilated High School in a Hot Humid Climate

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BIBLIOGRAPHY

END NOTES

1. Map, Engineering Department City of Austin, Texas

2. Sun Angles, Sun Angle Calculator

3. Normals, Means And Extreemes U.S. Weather Service

4. Space Summary, Energy Efficient School Design

5. Economic Cost Analysis, Means Cost data, Light Commercial, 1988

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---. Schools. Texas: Texas Architect. October 1991

---. P/A Inquiry: Schools. ukn: Progressive Architecture July 1991

---. Portfolio: Three Schools. ukn: Progressive Architecture Aug 1990

---. Correspondence Texas: L.M.Holder III AIA.

---. Energy Efficient School Design, Govenors Energy Office. 1990

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DOCUMENTATION

Documentation

The project began with an analysis of the site. I was looking for an area that had a good relation to the sun. After evaluating four areas the southeast facing hillside was chosen. Its morning sun and protection from the harsh after five sun beat all other locations easily. (2/3/92)

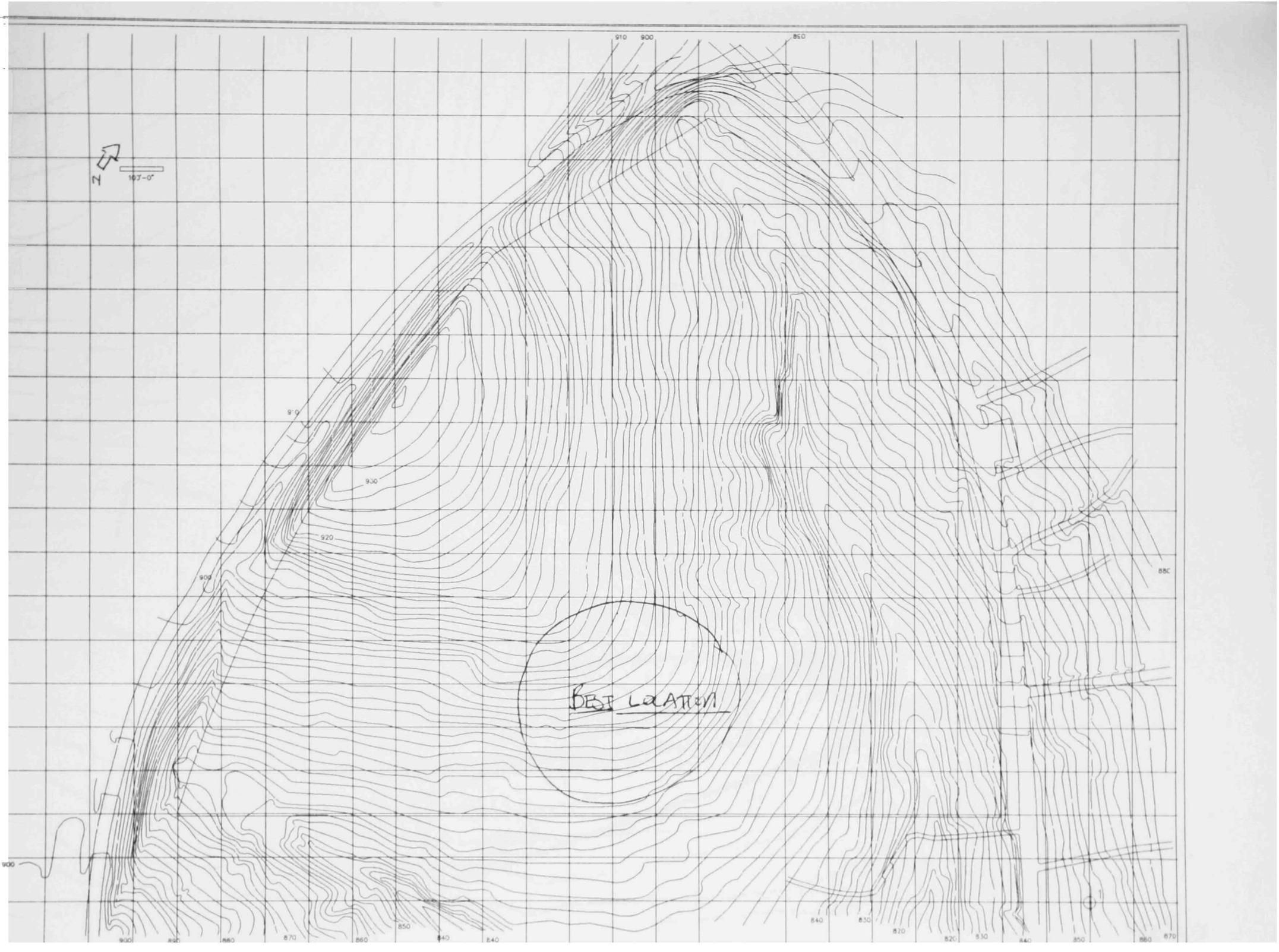
The next step was to define the shape of the building. This was done by basic organization. The classrooms by each other, the administration and library close together, and the gym and cafeteria adjacent. The administration group separating the gym and class groups. The reason for this separation is for greater control over access to and from the cafeteria and gym. These areas are not structured and to allow the activities in them to spill over into the classrooms would disrupt any class in progress. Using the topography of the hillside the classes were able to be stacked, or stepped up the hill. (2-18-91)

Some topographical manipulation was required to allow the building to be integrated into the site. (3/2/92) There was also considerable work needed to produce flat areas for the playing fields and parking areas. The area in front of the building, or front lawn, was also smoothed out.

The internal layout of spaces was next to be developed. (3/3/92 1,2,3,4) The classrooms were all on exterior walls so every room could have a window wall. The classrooms are arranged with the science on the end, math, health, English, language, then computer on the inside. Storage areas on the exterior and underground areas, and common and access (halls) areas located in interior spaces. There are openings in the floor of the upper two levels to link the spaces together. The music areas on the middle floor plan are stacked on top of the gym locker rooms. They have a common wall with the gym and that wall can be opened up to allow concerts with the gym as the auditorium. Since each of the three levels developed had multiple exits on grade, no fire stairs are required. The elevations show the basic outline of the component parts of the building. These area the drawings presented for the mid-term evaluation.

Documentation
Final Presentation

The mid-term evaluation brought one major change. (the final six drawings) The lower two classroom wings were changed to follow the outer wall of the higher floor. More attention was turned to the development of the exterior areas. The addition of two amphitheaters on the classroom end of the building. The addition of a deck area outside the cafeteria, and the field parking using pavers. The overall use of trees on the site plan shows the overall concern for shade trees in the playing filed areas and the use of screen on view blocking trees in other areas. The three floor plans show the development of the spaces as well as the placement of the doors. stairs. The sections show the placement of the windows and section cut A-A illustrates the solar characteristics of the classrooms. Simultaneously with the development of these drawings was the development of a 3-D computer model. The complexity of this model is illustrated in the VHS video used in the presentation. The model Consumed excessive amounts of time in its development and animation.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100'-0"
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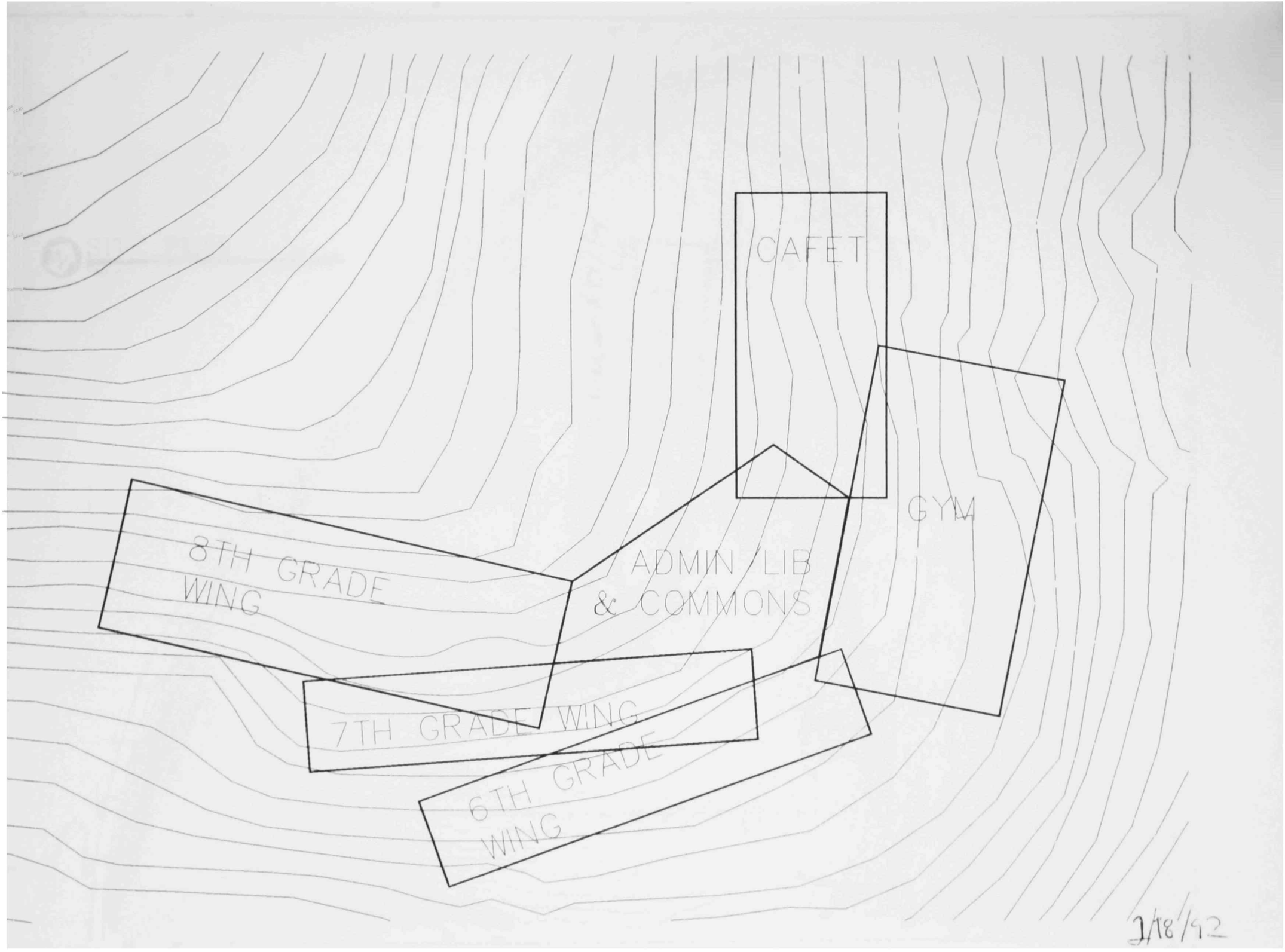
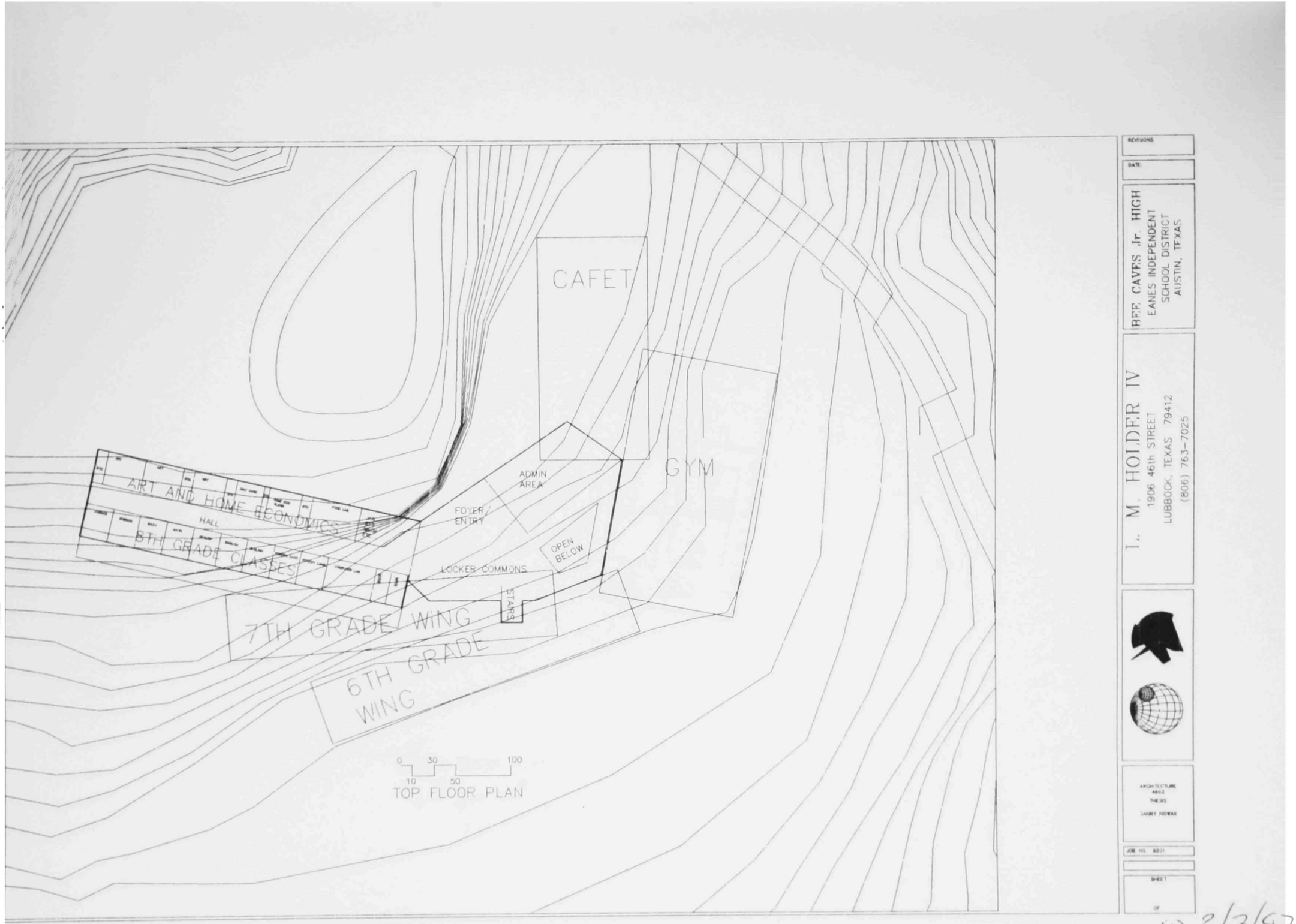
BEST LOCATION


CAFET
GYM
8TH GRADE WING
ADMIN / LIB & COMMONS
7TH GRADE WING
6TH GRADE WING
1/18/92

SITE PLAN
100'-0"
FIELD PARKING
TEACHER PARKING
CAFET
GYM
ADMIN/LIB & COMMONS
8TH GRADE WING
7TH GRADE WING
6TH GRADE WING

3/2/91



REVISIONS

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SHEET

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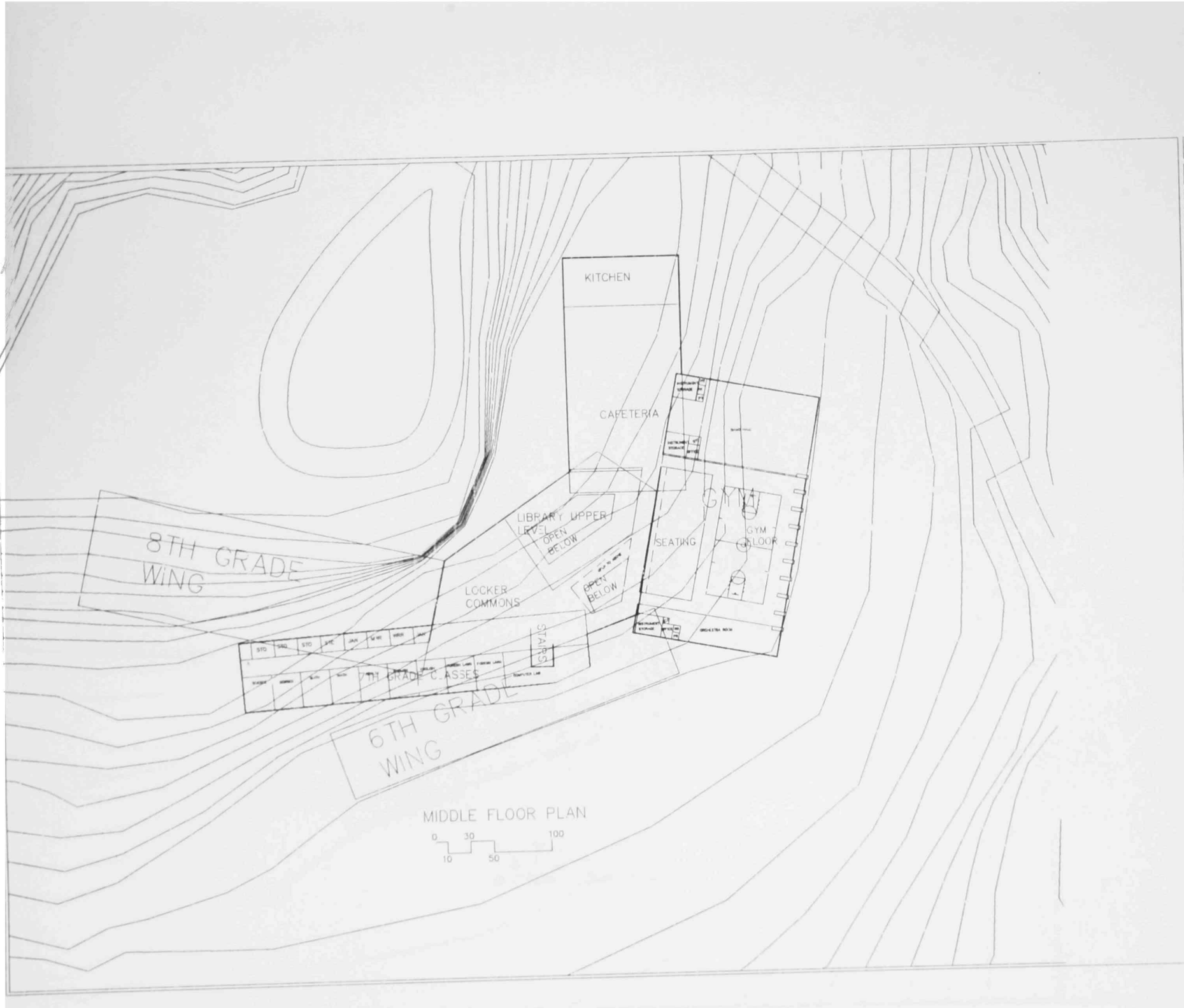

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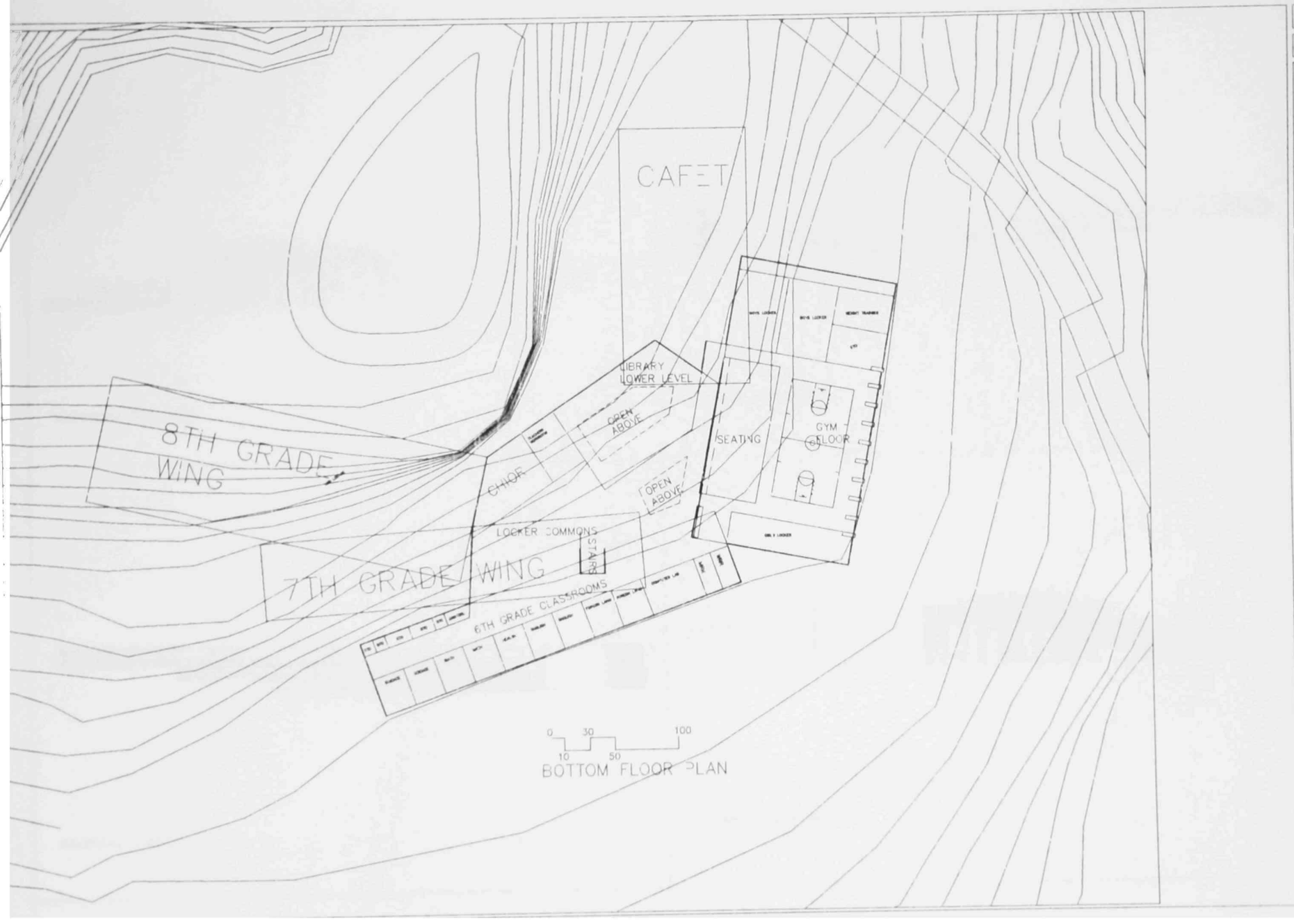

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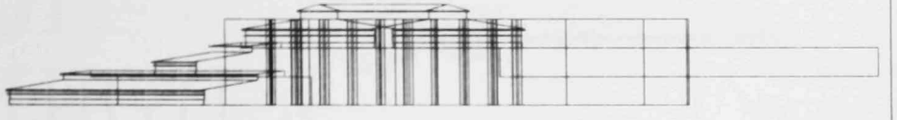
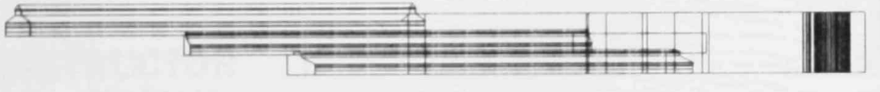


NORTHEAST ELEVATION

NORTHWEST ELEVATION



SOUTHEAST ELEVATION

SOUTHWEST ELEVATION

REVISIONS

DATE

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SHEET

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3/3/92

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WESTLAKE, TX

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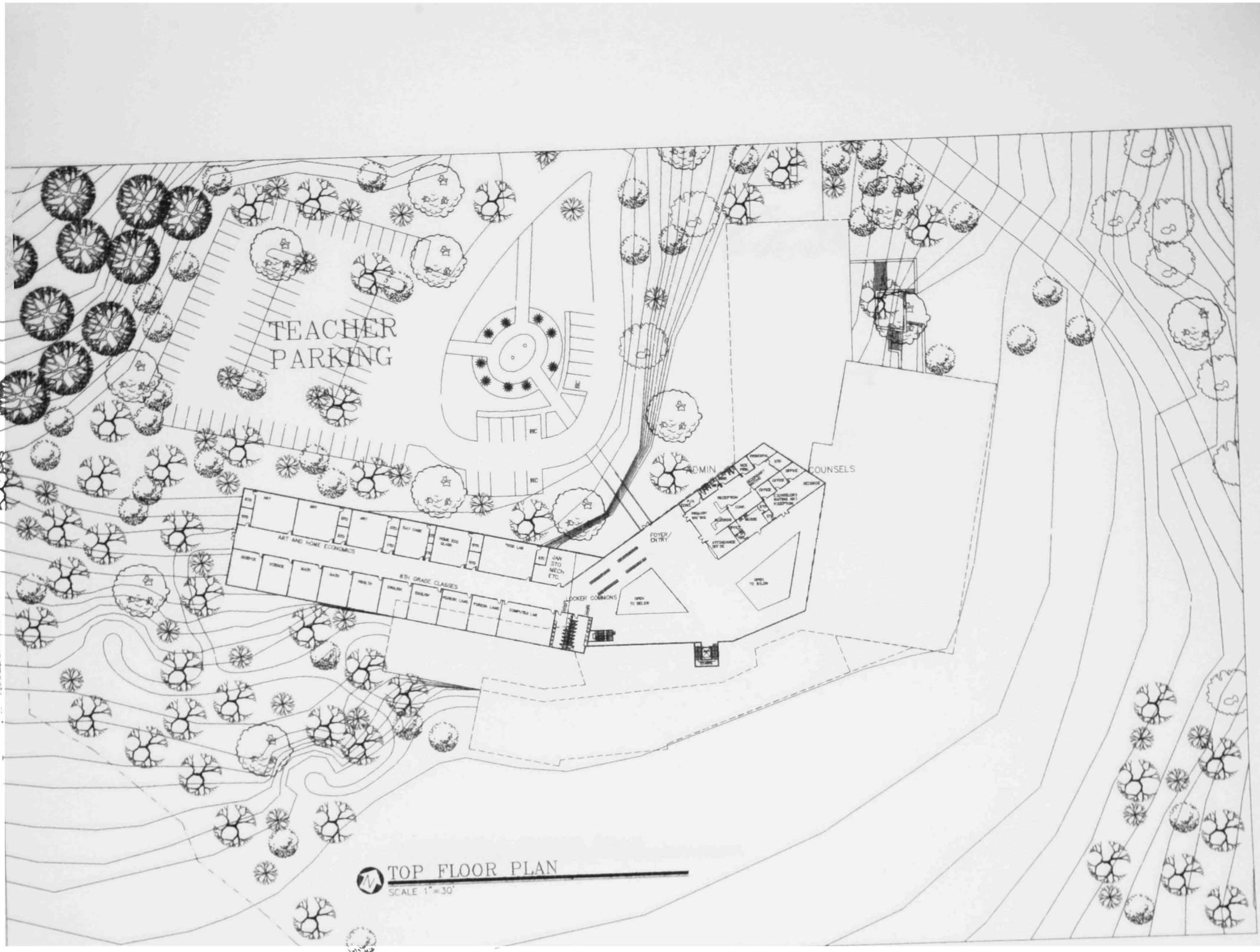
TEXAS TECH
UNIVERSITY
SPRING 1992

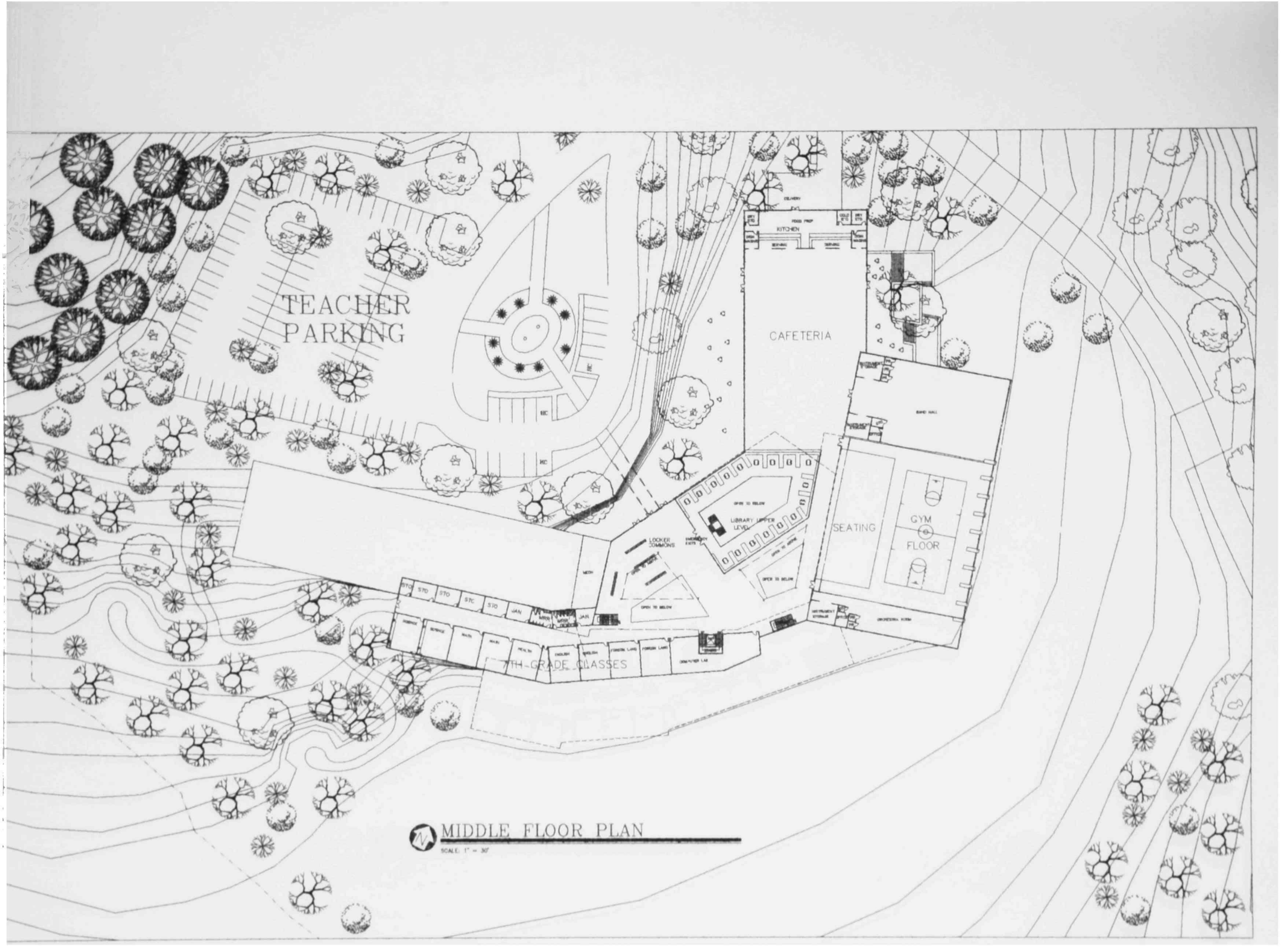
INSTRUCTOR:
D. NOWAK

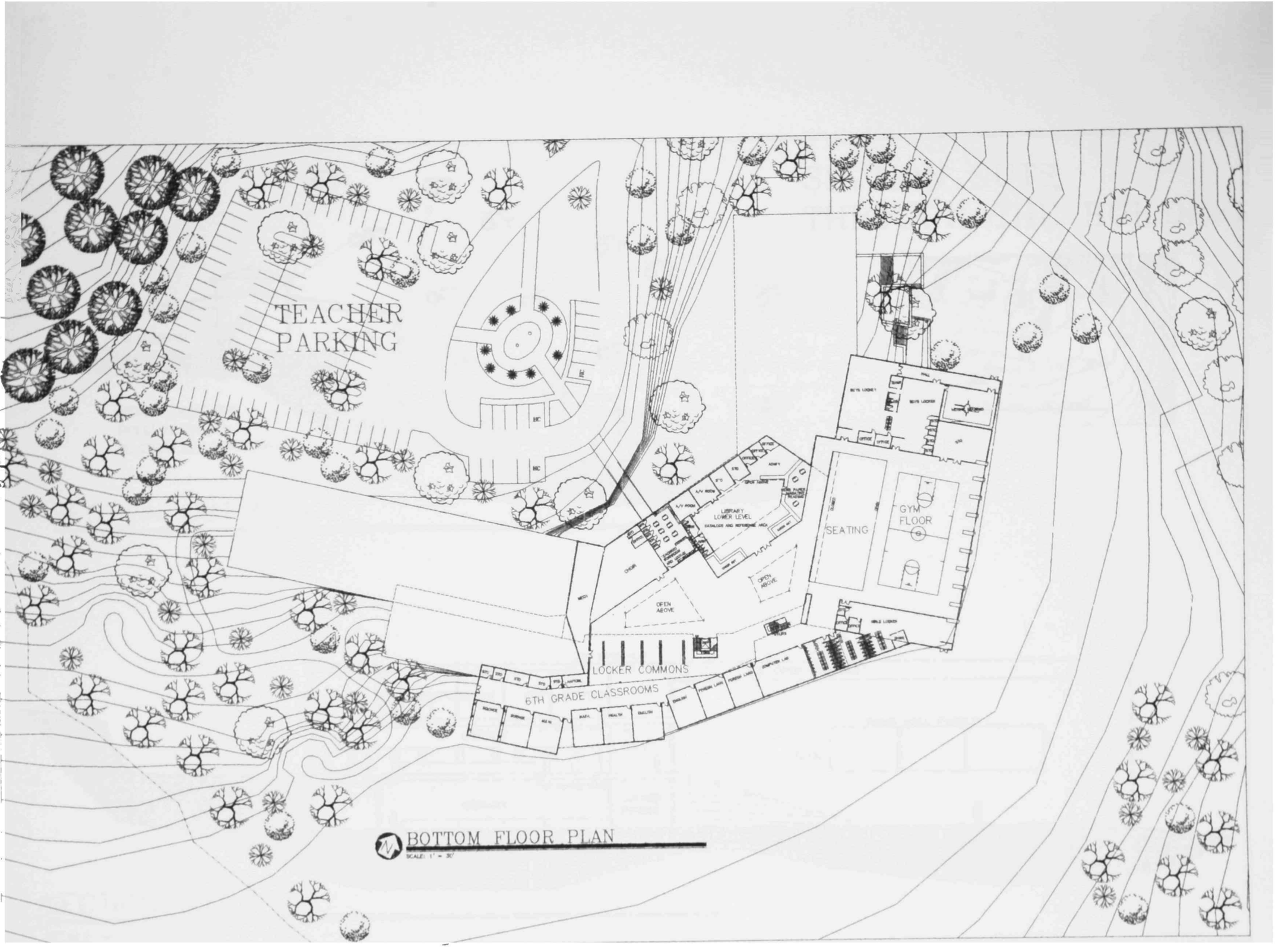
ADVISORS:
SPITZGLAS
DAUGHTRY



TOP FLOOR PLAN

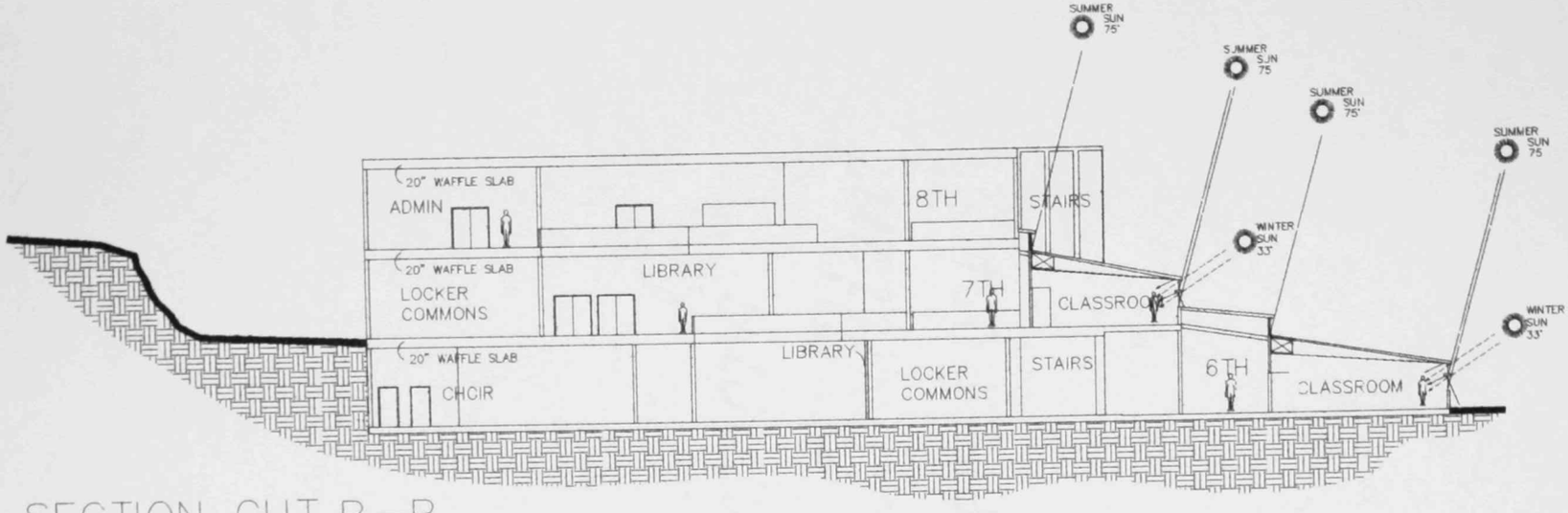
SCALE 1"=30'


TEACHER
PARKING
CAFETERIA
KITCHEN
DELIVERY
SEATING
GYM
FLOOR
LIBRARY UPPER LEVEL
LOCKER COMMONS
7TH-GRADE CLASSES
MIDDLE FLOOR PLAN
SCALE: 1" = 30'



BOTTOM FLOOR PLAN

SCALE: 1" = 30'



SECTION CUT B–B

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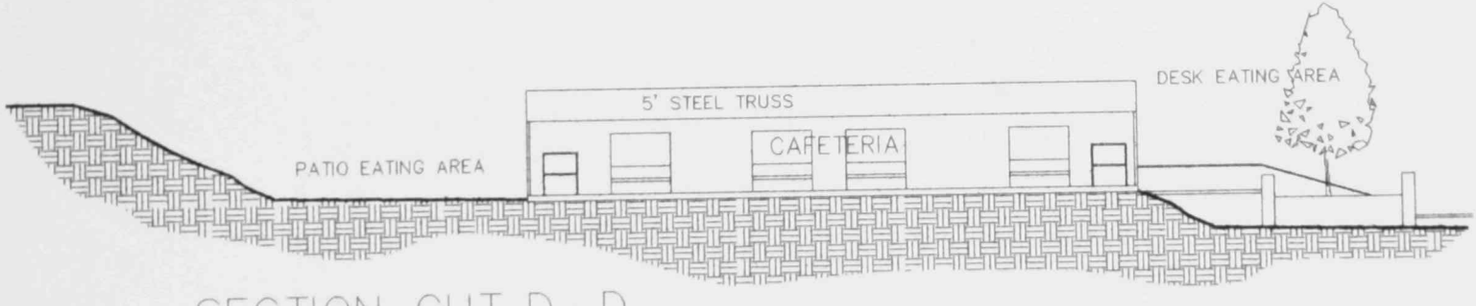

SECTION CUT D–D

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